

VIET NAM

H5N1 HPAI pathogenicity rising, but situation in check

HPAI H5N1 pathogenicity (including clades 2.3.2 and 2.3.4 circulating in the Red River basin and presumably imported from China, as well as the clade 1 virus that has prevailed in the Mekong delta since early 2004) seems to be rising gradually.

According to Mary Pantin-Jackwood of the US Department of Agriculture (USDA) in Athens, Georgia, and associated colleagues from the Viet Nam National Centre for Veterinary Diagnosis, this increase in pathogenicity translates into a more severe respiratory tract infection in ducks and an increase in cloacal virus titres.



Ducklings in Viet Nam (FAO/Astrid Tripodi)

However, despite higher virus pathogenicity, the avian influenza disease situation appears generally speaking fairly well in check, says Jan Slingenbergh, Senior Officer in FAO's Animal Production and Health Service, reporting on his participation in an international workshop on *Avian Influenza Research to Policy* from 16-18 June in Hanoi.

Slingenbergh said that longitudinal studies carried out by Joerg Henning from the Australian Centre for International Agricultural Research (ACIAR) in four different provinces of the Mekong Delta from May to November 2007 suggest that seroprevalence rates in unvaccinated chicken and ducks were between 5-20 percent but that there were low levels of virus shedding (few PCR-positives) and no HPAI outbreaks.

Evidently, added Slingenbergh, vaccination offers clinical protection in addition to containing virus spread. Importantly, protective antibody titres developed rather late, particularly in chicken, with titres taking up to six weeks to develop from the time of vaccination.

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Editor: Phil Harris, Senior Communication Officer, ECTAD (Phil.Harris@fao.org)

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Repeated vaccination in layer ducks appears very effective in protecting them from HPAI: out of 152 outbreaks recorded during the peak season (mid-November 2006 to mid-February 2007) in 66 communes scattered across the Mekong Delta, only one single outbreak involved layer ducks that had been vaccinated twice. Therefore, commented Slingenbergh, continued vaccination in layer ducks appears to be critical.

With ducks the predominant poultry species in the Mekong Delta and with 80 percent of these layer ducks, the FAO expert believes that HPAI in the southern part of Viet Nam is well in check. However, he added, northern Viet Nam requires strengthening with measures other than vaccination and the cost of vaccination campaigns can not continue to be entirely supported by public funds only.

EGYPT

Avian influenza now officially endemic

Egypt has formally informed the World Organisation for Animal Health (OIE) that avian influenza is endemic throughout the country's poultry. In a report dated 7 July 2008 on the avian influenza situation in the country, the Egyptian authorities said that 1,086 outbreaks caused by the H5N1 virus had been reported since February 2006, for the most part in the Nile Delta region. More than one million birds are said to have died from the virus and almost nine million destroyed. The Egyptian authorities also said that the country will start filing reports on the HPAI situation in the country every six months rather than issuing them more frequently.

[Click here](#) for the full OIE report.

Bird-to-cattle transmission H5N1 avian influenza could probably infect bovine calves

The H5N1 strain of avian influenza can infect bovine calves, says a group of scientists from the Friedrich-Loeffler-Institut in Germany. Reporting on an experiment in which they inoculated a few calves with highly pathogenic H5N1 facility to test bird-to-calf transmission and also calf-to-calf transmission, the scientists said that "although the question whether calf-to-calf transmission of HPAIV (H5N1) occurs could not be definitely answered by our study, bird-to-calf transmission resulting in seroconversion is probable."

Writing in the journal of the Centers for Disease Control and Prevention (CDC), *Emerging Infectious Diseases* (Volume 14, Number 7, July 2008), the scientists also said that conventional tests may underestimate such infections.

For the full report, see www.cdc.gov/eid/content/14/7/1132.htm.

Avian influenza Animals successfully immunized in trials

Researchers have immunized experimental animals against various strains of the virus, opening up hopes that their technique could lead to the production of vaccine reserves.

Reporting in the 25 June 2008 edition of *PLoS ONE*, researchers at the University of Pennsylvania's School of Medicine said they delivered vaccines to three types of animal – mice, ferrets and non-human primates – via DNA constructed to build antigens against influenza, along with a minute electric pulse.

"This is the first study to show that a single DNA vaccine can induce protection against strains of pandemic flu in many animal models, including primates," said David B. Weiner, professor of pathology and laboratory medicine. "With this type of vaccine, we can generate a single construct of a pandemic flu vaccine that will give much broader protection."

Traditional vaccines expose a formulation of a specific strain of flu to the body so it can create immune responses against that specific strain. Conversely, a DNA vaccine becomes part of the cell, giving it the blueprint it needs to build antigens that can induce responses that target diverse strains of pandemic flu.

Instead of injecting a live or killed virus, the researchers injected animal models with synthetic DNA vaccines that are not taken from the flu microbe, but trick the immune system into mounting a broad response against pandemic flu, including strains to which the immune system was never exposed. Antibodies induced by the vaccine rapidly reached protective levels in all three animal species.

Summing up their findings, the researchers say: "By combining several consensus influenza antigens with in vivo electroporation, we demonstrate that these antigens induce both protective cellular and humoral immune responses in mice, ferrets and non-human primates. We also demonstrate the ability of these antigens to protect from both morbidity and mortality in a ferret model of HPAI, in both the presence and absence of neutralizing antibody, which will be critical in responding to the antigenic drift that will likely occur before these viruses cross the species barrier to humans."

Read the full report at <http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0002517>.

MOST RECENT HPAI OUTBREAKS 2006-08

Note: This list has been compiled on the basis of information up to 25 July 2008.

2008

July	Indonesia, Nigeria, Viet Nam
June	China, China (Hong Kong SAR), Egypt, Pakistan
May	Bangladesh, India, Japan, Korea (Republic of), United Kingdom [H7N7]
April	Russian Federation
March	Lao PDR, Turkey
February	Switzerland , Ukraine
January	Israel, Saudi Arabia, Thailand

2007

December	Benin, Germany, Iran, Myanmar, Poland
November	Romania
October	Afghanistan
August	France
July	Czech Republic, Togo
June	Ghana, Malaysia
April	Cambodia, Kuwait
January	Hungary

2006

November	Côte d'Ivoire
August	Sudan
July	Spain
June	Mongolia , Niger
May	Burkina Faso, Denmark
April	Djibouti, Sweden, West Bank & Gaza Strip
March	Albania, Austria, Azerbaijan, Cameroon, Croatia , Greece , Jordan, Kazakhstan, Serbia, Slovenia
February	Bosnia-Herzegovina , Bulgaria , Georgia , Iraq, Italy , Slovakia

Green: wild birds only

Sources: World Organisation for Animal Health (OIE), European Commission (EC), FAO and national governments

This overview is produced by the FAO-GLEWS team, which collects and analyses epidemiological data and information on animal disease outbreaks as a contribution to improving global early warning under the framework of the Global Early Warning and Response System for Major Animal Diseases including Zoonoses. glews@fao.org

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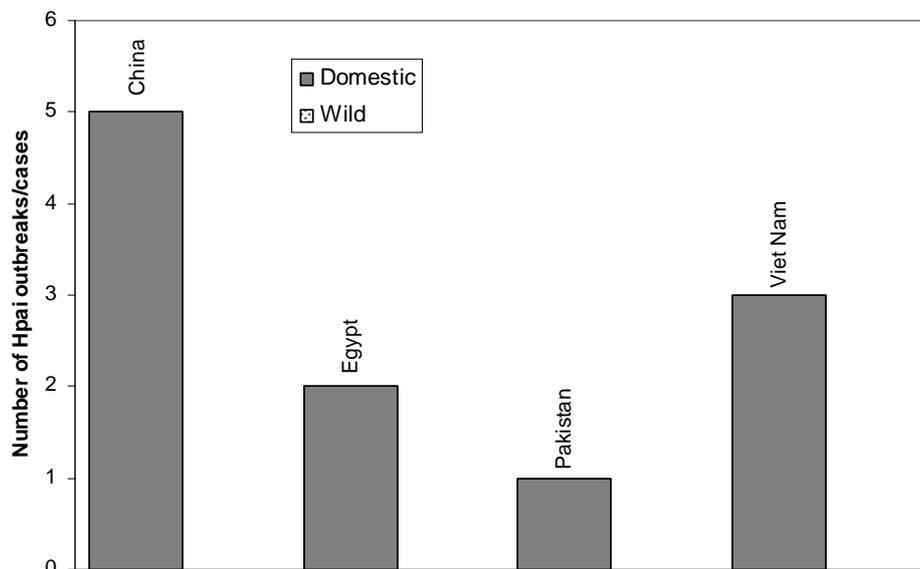
As this issue of AIDEnews went to print, FAO received information of outbreaks of H5N1 HPAI in Nigeria. On July 25, Nigerian animal health authorities informed the OIE of two outbreaks in the country, the first since the previous outbreak in October 2007. The first outbreak occurred on June 27 among poultry at a live-bird market in the state of Kebbi, in the northwest of the country; the second took place on July 19 among ducks in another live-bird market, this time in the state of Gombo, in the eastern-central part of the country. Investigations are under way to establish the source of the virus which currently appears to be of a new strain. Investigations are under way.

WORLDWIDE

Only eleven outbreaks/cases of HPAI (H5N1) were reported worldwide in June 2008 in five countries (China, Egypt, Indonesia, Pakistan and Viet Nam). This compares with 65 outbreaks in June 2006 and 55 in June 2007. The geographical location of outbreaks in poultry and cases in wild birds is shown in Figure 1. No cases were reported in wild birds. Indonesia has not submitted reports on HPAI events* since May 2008 because the new database for the PDSR system is being modified and data still is not available.

FIGURE 1
HPAI (H5N1) outbreaks confirmed during June 2008

(Source: FAO EMPRES-I); (excluding Indonesia's PDS data)



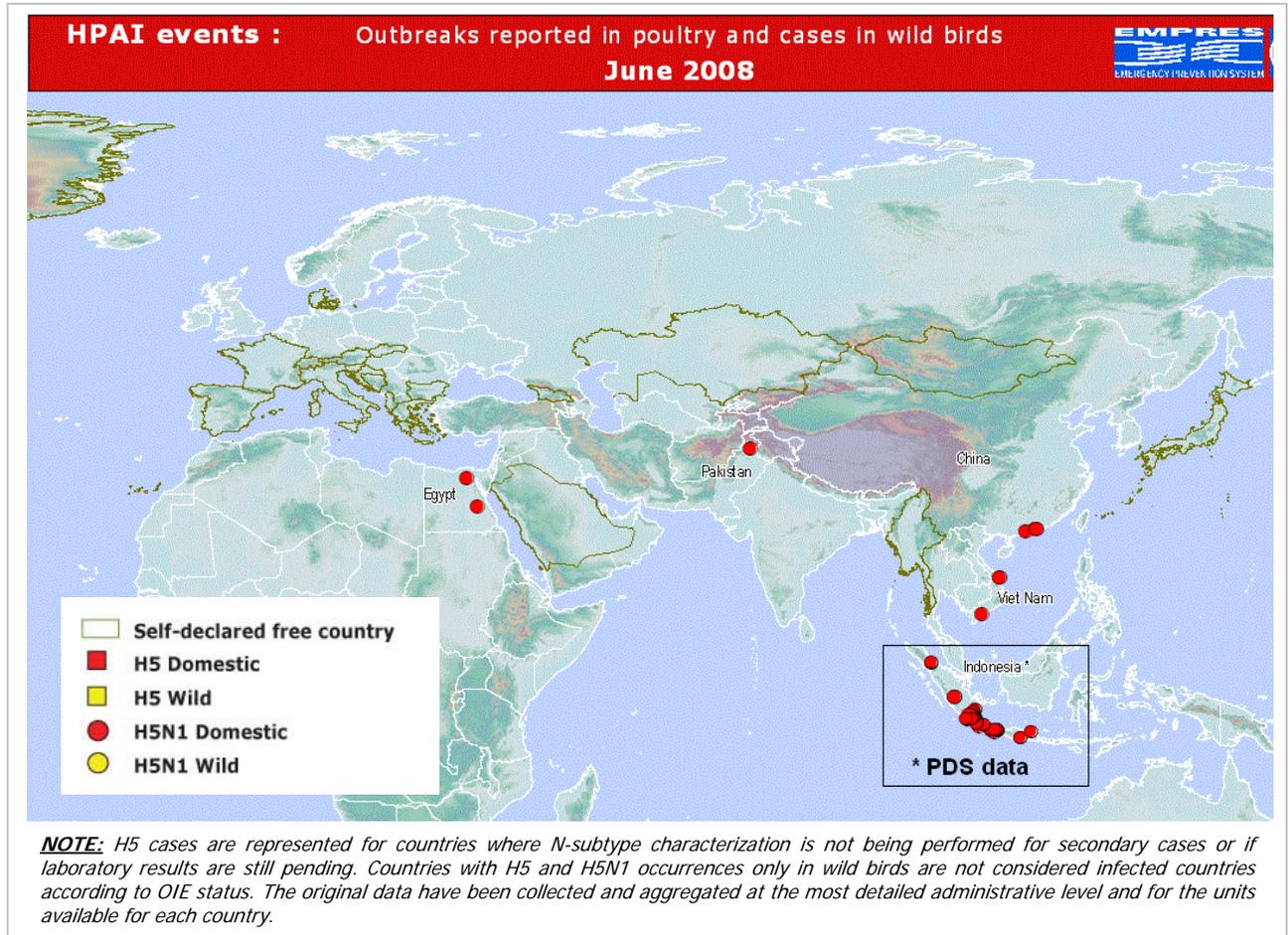
The Indonesia data are not included in Figures 1, 3, 4 and 7 because the outbreak information collected in Indonesia is not comparable with that of other countries; in addition, the case definition changed from "household" to "village" level on 1 April 2008.

* PDS case definition in Indonesia: When active outbreaks are encountered where severely sick birds, or recently deceased carcasses (within 12 hours of death) are present, the Participatory Disease Surveillance (PDS) teams carry out an influenza type A rapid test (Anigen© test). A mortality event consistent with clinical HPAI and a positive rapid test in affected poultry is considered a confirmed detection of HPAI in areas where HPAI has previously been confirmed by laboratory testing.

The overall HPAI outbreak situation worldwide in June 2008 is represented in Figure 2.

FIGURE 2
HPAI (H5N1) outbreaks in poultry and cases of H5N1 infection in wild birds reported in June 2008

(Source: FAO EMPRES-i)



The evolution of the number of reported cases over the last six months by continent and by species group (wild or domestic) is represented in Figures 3 and 4, respectively.

FIGURE 3

Weekly combined numbers of HPAI (H5N1) outbreaks in poultry and cases of H5N1 infection in wild birds per continent reported between January and June 2008

(Source: FAO EMPRES-i) (excluding Indonesia's PDS data)

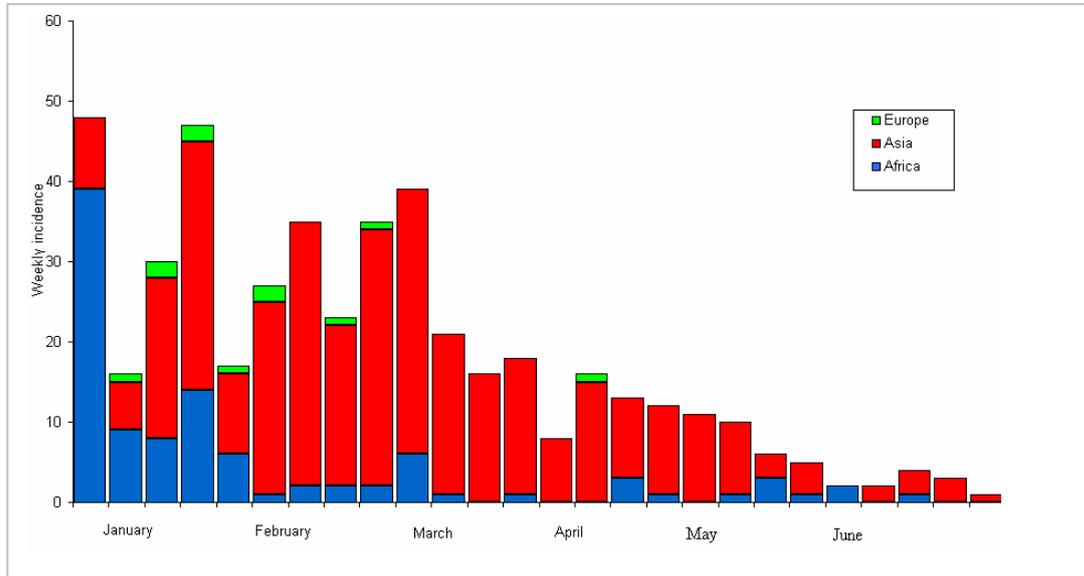
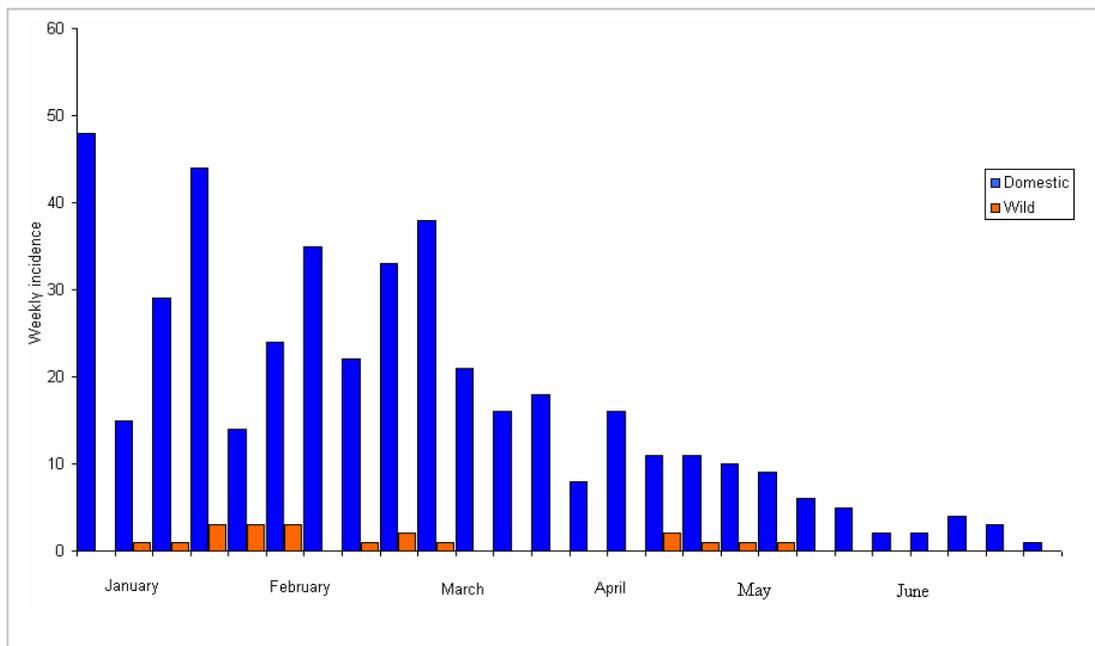


FIGURE 4

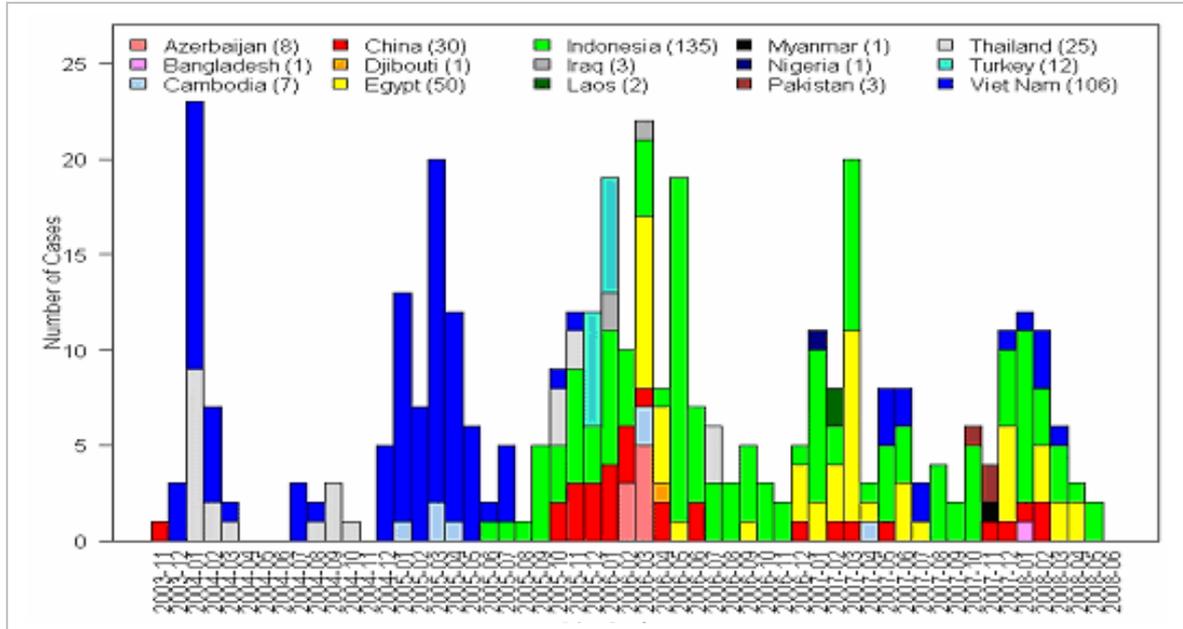
Weekly numbers of HPAI (H5N1) outbreaks in poultry compared with cases of H5N1 infection in wild birds reported between January and June 2008

(Source: FAO EMPRES-i) (excluding Indonesia's PDS data)



For the same period, the number of human cases reported to the World Health Organization (WHO) is illustrated in Figure 5.

FIGURE 5
Current situation of H5N1 in humans
(Source: World Health Organization)



SITUATION BY CONTINENT/REGION

Africa

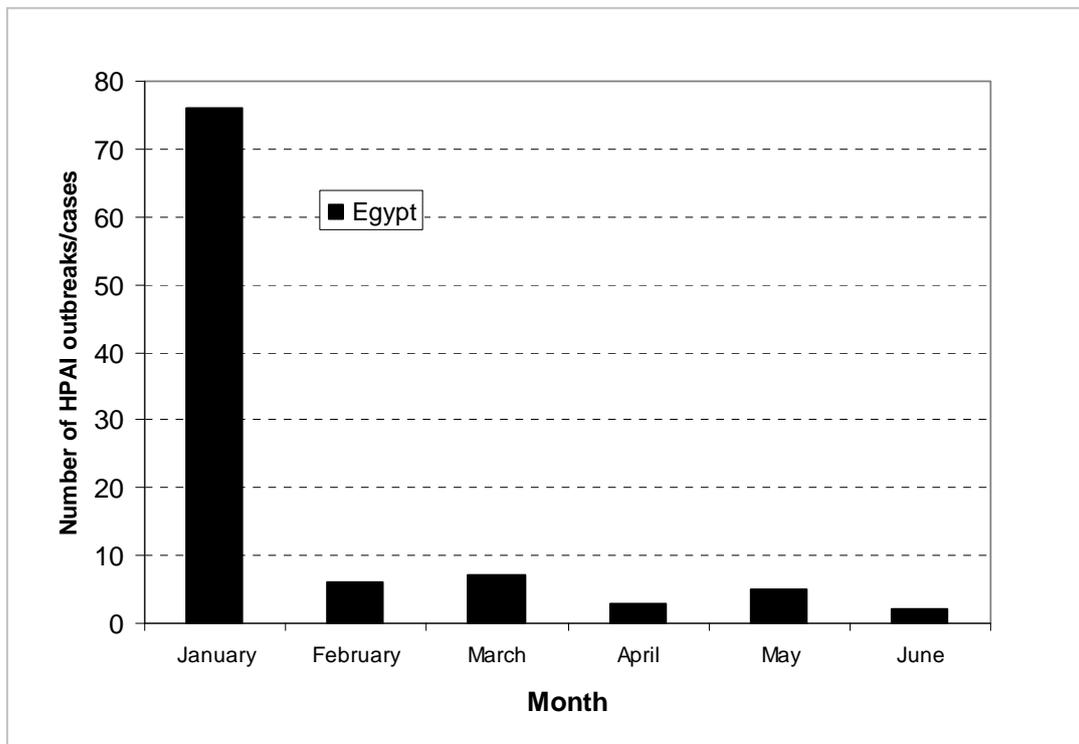
In **Egypt**, only two HPAI outbreaks were reported during June 2008 affecting different species (chickens, geese and ducks) and types of production systems (backyard and layers). The outbreaks were detected through active and passive surveillance.

In **Nigeria**, no new outbreak of HPAI has been confirmed since the 8 October 2007, when one sample from Anambra state was confirmed positive. Overall, between January and 12 May 2008, a total of 325 samples from suspected HPAI in 17 states and the Federal Capital Territory were examined by the National Veterinary Research Institute and none was positive for H5N1 virus.

For an update on the Nigeria situation, see **Stop Press** at the beginning of this overview.

FIGURE 6
Number of outbreaks/cases of HPAI (H5N1) confirmed between
January and June 2008 in Africa

(Source: FAO EMPRES-i)



Asia

Indonesia has experienced a high number of cases of HPAI type H5N1 in poultry in the last three years. HPAI remains endemic in Java, Sumatra, Bali and South Sulawesi with sporadic outbreaks reported from other areas. Infection has continued to spread during the year with outbreaks occurring in many of the remaining free areas.

The high figure of reported cases for Indonesia in 2007-08 is largely due to the ongoing 'participatory disease search' (PDS) programme that uses participatory techniques combined with an influenza type A rapid test to identify cases of HPAI in backyard village-type poultry production environments (Figures 1 and 3). The programme is supported by FAO and is operating in 193 out of 448 districts and nine provinces in Java, Sumatra and Bali. Outbreaks have been reported infrequently from the eastern provinces where it is likely that H5N1 HPAI is more sporadic in the smaller more dispersed poultry populations.

The new database for the PDSR system in Indonesia has been modified since 1 April 2008 and is now based on the village as the epidemiology unit. A decrease in the number of outbreaks reported is therefore expected from the PDSR programme beginning in April 2008.

Two human cases were officially reported by the Indonesian Ministry of Health in June 2008, a 16-year old girl from South Jakarta and a 34-year old woman from Serang, Banten Province. The ministry stated that it was to discontinue reporting cases as they occurred and would henceforth only report cases on a six-monthly basis. Of the 135 human cases confirmed to date in Indonesia, 110 have been fatal.

In **Bangladesh**, after several months with outbreaks reported all over the country, no outbreak was reported in the month of June 2008. As of 30 June 2008, a total of 287 outbreaks had been recorded in 47 out of 64 districts. These included outbreaks in 245 commercial farms and 42 outbreaks in backyard poultry production systems. The total number of birds culled as of 30 June 2008 is approximately 1.64 million.

HPAI was last reported in **China** in Yashan Village in China's southern Guangdong Province on 17 June. Since the beginning of the year, this is the 7th outbreak in China and the second in Guangdong province (since 13 March). A total of 3,873 ducks died and another 17,127 ducks were culled. According to the ministry, emergency measures have been taken and the epidemic has been brought under control. Guangdong province also provides much of the poultry to Hong Kong SAR, where the infection was detected in live bird markets in early June, for the first time in five years. Mass culling has been conducted as a precaution to control the spread of the virus in Hong Kong SAR. The government temporarily banned supplies from all live poultry from mainland China.

After two months with no outbreaks, **Pakistan** reported H5N1 HPAI at a commercial poultry farm in the country's northwest.

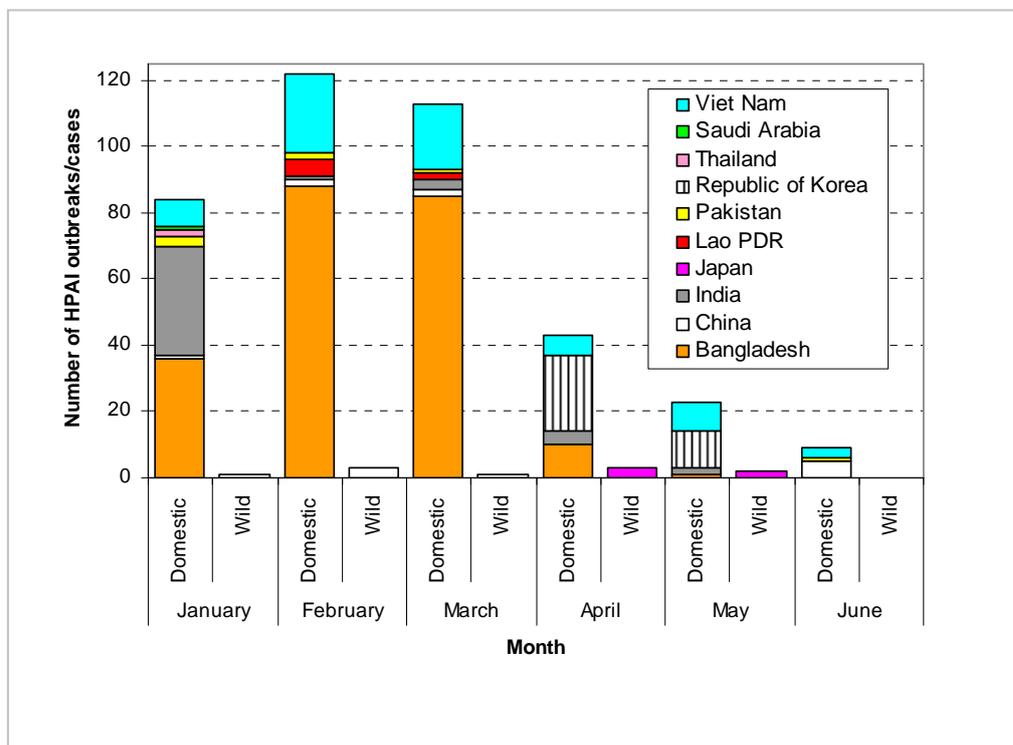
The H5N1 HPAI epidemic in the **Republic of Korea** seems to be under control, with no H5N1 reported during June 2008.

Outbreaks of H5N1 in poultry have been reported regularly by **Viet Nam** (three outbreaks in June), affecting both ducks and chickens. No human cases were reported to WHO during this period.

Some Asian countries such as Cambodia and Iraq did not experience outbreaks of HPAI in June 2008, but they report regularly about the negative results obtained from all samples submitted from suspected cases. **Cambodia** is using an animal health hotline activity to receive reports from the field on suspicious outbreaks or cases of HPAI. **Iraq** also reported the laboratory results of their surveillance activities for the month of June. These data refer to all governorates except Kurdistan Province, in the north of the country. All samples taken were negative [poultry farms (1,439), backyard poultry (1,356), game and wild birds (1,179), and markets and slaughterhouses (3,914)]. The only avian influenza virus identified was H9 in samples collected from poultry farms in Najaf governorate.

FIGURE 7
Number of outbreaks/cases of HPAI (H5N1) confirmed between January and June 2008 in Asia

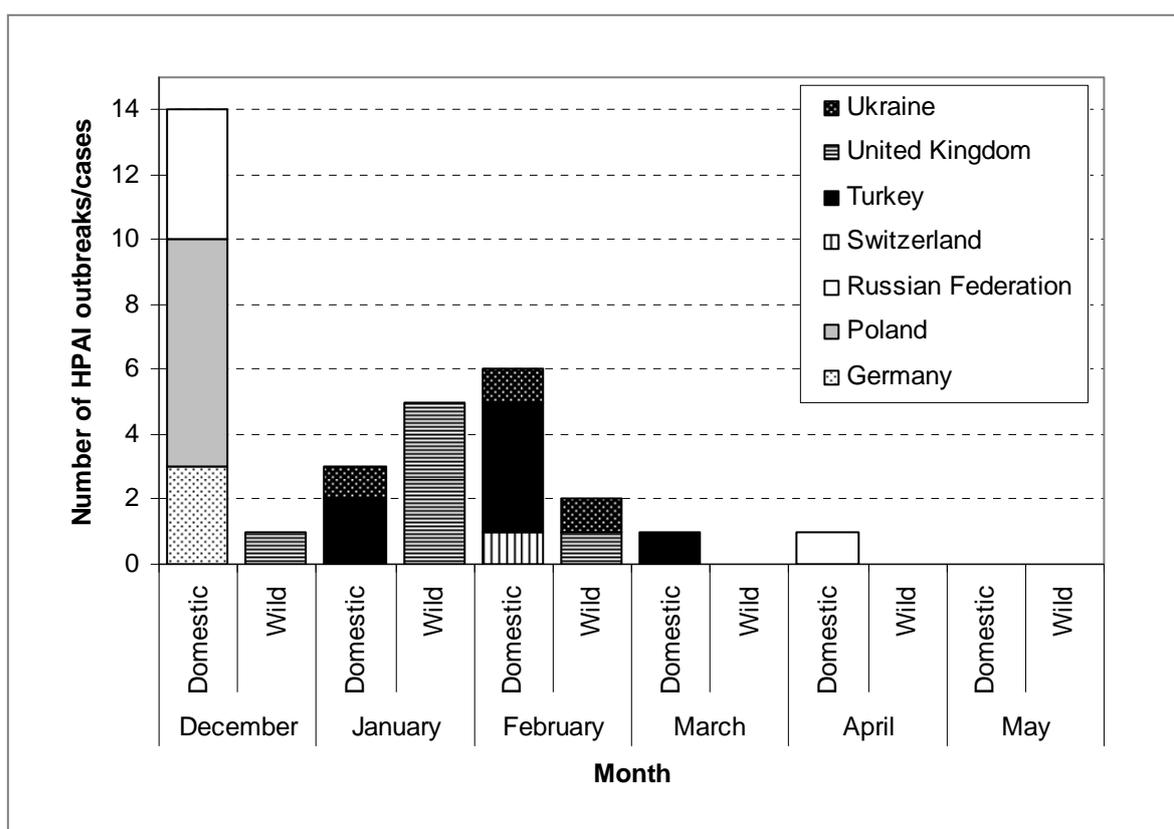
(Source: FAO EMPRES-i) (excluding Indonesia's PDS data)



Europe

No HPAI outbreak has been reported in domestic poultry and no cases were reported in wild birds during June 2008. The last case in poultry in Europe was reported on 22 May 2008 (HPAI H7N7) and in wild birds on 29 February 2008, both in the United Kingdom.

FIGURE 8
Number of outbreaks (domestic poultry)/cases (wild birds) of HPAI (H5N1) confirmed between January and June 2008 in Europe
(Source: FAO EMPRES-i)



CONCLUSIONS

Considering the number of outbreaks reported worldwide, the global HPAI situation can be said to have improved markedly in the first half of 2008. Nevertheless H5N1 HPAI endemic countries continue to report outbreaks of HPAI (Egypt, China, Indonesia and Viet Nam), and the reoccurrence of the infection in areas such as one outbreak in Pakistan or the infection detected in live bird markets in Honk Kong SAR.

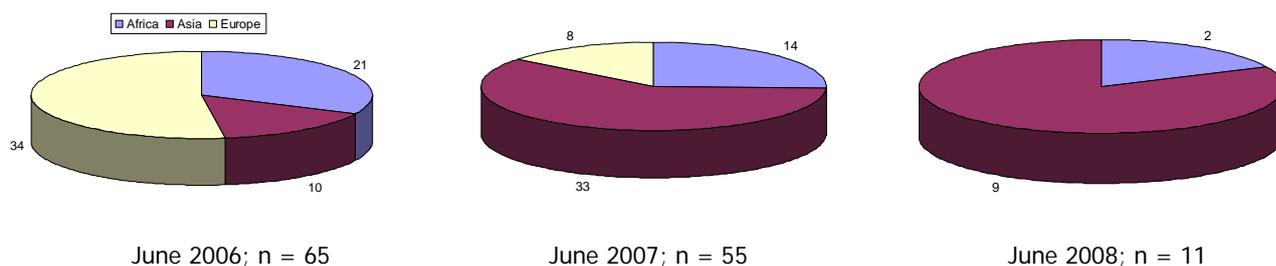
The Republic of Korea has not reported outbreaks in the last month, nor has Bangladesh although the virus is probably still circulating in the country.

Overall, in the month of June 2008, the number of reported outbreaks is much lower than those of June 2006 and 2007 (Figure 8). Particularly Europe did not report any outbreak, unlike previous months of June. Although there has been an improvement in disease awareness, outbreaks/cases of HPAI are still underestimated and underreported in many countries because of limitations in country disease surveillance systems, which may affect considerably the shape of the distribution of outbreaks by region. The variability

and sensitivity in space and time of HPAI surveillance systems makes difficult to draw correct conclusions on the results and performance of countries affected in their fight against HPAI type H5N1.

An animated map showing the evolution of outbreaks over the last six months including June 2008 is available at: www.fao.org/ag/againfo/programmes/en/empres/maps.html.

FIGURE 9
Number and distribution of outbreaks of HPAI (H5N1) confirmed in June 2006, 2007 and 2008
(Source: FAO EMPRES-i) (excluding Indonesia's PDS data)



AT A GLANCE

The latest HPAI outbreaks for the period 17 June – 25 July 2008

Note

AIDEnews publishes reports of **confirmed HPAI cases** using the following sources: OIE, European Commission, FAO and national governments.

AFRICA

Egypt

According to OIE, 19 outbreaks of HPAI in 2008 had been reported as of 7 July – six in February, six in March, five in May and two in June – affecting chickens, ducks and geese.

Nigeria

After nearly 10 months without an outbreak, new HPAI outbreaks were confirmed in backyard/commercial poultry in the northern part of the country – in the village of Fagen-Kawo, Kano, and the area of Kagarko, Katsina, on 24 July. At the time of publication, investigation was under way to trace the source of infection. Earlier, in June, two positive cases had been discovered in live-bird markets in the northeastern town of Gombe and the northwestern town of Birnin Kebbi.

ASIA

China

The Chinese Ministry of Agriculture reported that the National AI Reference Laboratory had confirmed on 17 June an outbreak of H5N1 HPAI among ducks in Jiangmen, province of Guangdong.

Hong Kong SAR

Government officials reported mid-June that an outbreak of H5N1 HPAI in poultry in food markets had led to the culling of live poultry across the city. According to officials, all the island's wet market stores and fresh food stores selling live poultry were infected areas and all poultry in these sales points (not on local farms) were being culled.

Indonesia

On 10 July, H5 HPAI was reported in the village of Tanjung Bajak in Bengkulu province. It was reported that 40 out of 200 chickens died between 4 and 9 July, and some dead cocks among 200 smuggled fighting cocks and 40 smuggled ducks were discovered in Gilimanuk, province of Bali.

Pakistan

On 24 June, the Pakistani authorities confirmed an outbreak of HPAI at a commercial poultry farm in the Swabi district the country's northwest, killing thousands of birds. The incident had been reported to the OIE.

Viet Nam

On 22 July, the country's Department of Animal Health (DAH) confirmed HPAI in poultry:

21 July – DAH reported HPAI at a poultry raiser in Hamlet No. 9, Nghi Phuong commune, Nghi Loc district, Nghe An province, killing unvaccinated chickens as well as 160 ducks.

20 July - DAH reported HPAI among chickens in the hamlet of Tan Hoa, commune of Tan Nhuan Dong, in Dong Thap province.

As of 22 July, three provinces (Tra Vinh, Dong Thap and Nghe An) had been affected by HPAI in the previous three weeks.

SUMMARY OF CONFIRMED HPAI OUTBREAKS (as of 25 July 2008)

Sources: OIE, European Commission (EC), FAO and national governments – WHO for human cases/deaths

Note: Highlighted countries indicate those in which there has been only one officially confirmed outbreak or occurrence

AFRICA	First outbreak	Latest outbreak	Animals affected to date	Human cases / deaths to date
Benin	7 November 2007	15 December 2007	Domestic poultry	-
Burkina Faso	1 March 2006	20 May 2006	Domestic poultry - wild birds	-
Cameroon	21 February 2006	28 March 2006	Domestic poultry – wild birds	-
Côte d'Ivoire	31 March 2006	9 November 2006	Domestic poultry – wild birds	-
Djibouti	6 April 2006	6 April 2006	Domestic poultry	1 / 0
Egypt	17 February 2006	14 June 2008	Domestic poultry – wild birds	50 / 22
Ghana	14 April 2007	13 June 2007	Domestic poultry	-
Niger	6 February 2006	1 June 2006	Domestic poultry	-
Nigeria	16 January 2006	22 July 2008	Domestic poultry – wild birds	1 / 1
Sudan	25 March 2006	4 August 2006	Domestic poultry	-
Togo	6 June 2007	20 July 2007	Domestic poultry	-

ASIA	First outbreak	Latest outbreak	Animals affected to date	Human cases / deaths to date
Afghanistan	2 March 2006	2 October 2007	Domestic poultry – wild birds	-
Bangladesh	5 February 2007	19 May 2008	Domestic poultry	1 / 0
Cambodia	12 January 2004	6 April 2007	Domestic poultry – wild birds	7 / 7
China	20 January 2004	13 June 2008	Domestic poultry – wild birds	30 / 20
China (Hong Kong SAR)	19 January 2004	11 June 2008	Wild birds	-
India	27 January 2006	9 May 2008	Domestic poultry	-
Indonesia	2 February 2004	9 July 2008	Domestic poultry – pigs (with no clinical signs)	135/ 110
Japan	28 December 2003	8 May 2008	Domestic poultry – wild birds	-
Kazakhstan	22 July 2005	10 March 2006	Domestic poultry – wild birds	-
Korea, Rep. of	10 December 2003	12 May 2008	Domestic poultry – wild birds	-
Lao, PDR	15 January 2004	2 March 2008	Domestic poultry	2 / 2
Malaysia	19 August 2004	2 June 2007	Domestic poultry – wild birds	-
Mongolia	10 August 2005	5 June 2006	Wild birds	-
Myanmar	8 March 2006	23 December 2007	Domestic poultry	1 / 0
Pakistan	23 February 2006	16 June 2008	Domestic poultry – wild birds	3 / 1
Thailand	23 January 2004	18 January 2008	Domestic poultry – wild birds – tiger	25 / 17
Viet Nam	9 January 2004	20 July 2008	Domestic poultry	106/ 52

NEAR EAST	First outbreak	Latest outbreak	Animals affected to date	Human cases / deaths to date
Iran	2 February 2006	10 December 2007	Domestic poultry - wild birds	-
Iraq	18 January 2006	1 February 2006	Domestic poultry – wild birds	3 / 2
Israel	16 March 2006	1 January 2008	Domestic poultry	-
Jordan	23 March 2006	23 March 2006	Domestic poultry	-
Kuwait	23 February 2007	20 April 2007	Domestic poultry – wild birds – zoo birds	-
Saudi Arabia	12 March 2007	29 January 2008	Domestic poultry	-
West Bank & Gaza Strip	21 March 2006	2 April 2006	Domestic poultry	-

EUROPE	First outbreak	Latest outbreak	Animals affected to date	Human cases / deaths to date
Albania	16 February 2006	9 March 2006	Domestic poultry	-
Austria	10 February 2006	22 March 2006	Wild birds – cats	-
Azerbaijan	2 February 2006	18 March 2006	Wild birds – domestic poultry – dogs	8 / 5
Bosnia-Herzegovina	16 February 2006	16 February 2006	Wild birds	-
Bulgaria	31 January 2006	9 February 2006	Wild birds	-
Croatia	21 October 2005	24 March 2006	Wild birds	-
Czech Republic	27 March 2006	11 July 2007	Wild birds – domestic poultry	-
Denmark	12 March 2006	26 May 2006	Wild birds – domestic poultry	-
France	17 February 2006	14 August 2007	Wild birds – domestic poultry	-
Georgia	23 February 2006	23 February 2006	Wild birds	-
Germany	8 February 2006	25 December 2007	Wild birds – domestic poultry – cats – stone marten	-
Greece	30 January 2006	27 March 2006	Wild birds	-
Hungary	4 February 2006	23 January 2007	Wild birds – domestic poultry	-
Italy	1 February 2006	19 February 2006	Wild birds	-
Poland	2 March 2006	16 December 2007	Wild birds – domestic poultry	-
Romania	7 October 2005	6 December 2007 (cat)	Wild birds – domestic poultry – cat	-
Russian Federation	15 July 2005	8 April 2007	Domestic poultry – wild birds	-
Serbia	28 February 2006	16 March 2006	Wild birds – domestic poultry	-
Slovakia	17 February 2006	18 February 2006	Wild birds	-
Slovenia	9 February 2006	25 March 2006	Wild birds	-
Spain	7 July 2006	7 July 2006	Wild birds	-
Sweden	28 February 2006	26 April 2006	Wild birds – domestic poultry - game birds - mink	-
Switzerland	26 February 2006	22 February 2008	Wild birds	-
Turkey	1 October 2005	9 March 2008	Domestic poultry – wild birds	12 / 4
Ukraine	2 December 2005	11 February 2008	Wild birds – domestic poultry – zoo birds	-
United Kingdom	30 March 2006	22 May 2008 (H7N7)	Wild birds – domestic poultry	-