

SUMMARY

Since 2003, H5N1 has killed or forced the culling of more than 400 million domestic poultry and caused an estimated US\$20 billion in economic damage across the globe before it was eliminated from most of the 63 countries infected at its peak in 2006.

However, the H5N1 HPAI virus remained endemic in six nations, although the number of outbreaks in domestic poultry and wild bird populations shrank steadily from an annual peak of 4,000 to just 302 in mid 2008. But outbreaks have risen progressively since, with almost 800 cases recorded in 2010-2011.

During the reporting period, 131 domestic poultry outbreaks were reported from seven (7) countries /territories (Bangladesh, Cambodia, Egypt, India, Indonesia, Iran and, Viet Nam), [2] confirmed reports of human cases in two countries (Cambodia and Egypt) and one confirmed wild bird event in Cambodia.

The period July to September generally represents a lull in the H5N1 HPAI season, which normally spans the April to June period, when reports of outbreaks decrease globally. As expected, during the third quarter of 2011, the number of countries reporting outbreaks has remained constant at six (see Figure 3a) and the number of outbreaks/cases reported globally has decreased (from 396 to 129; see Figure 2a).

Compared to the same period in 2009 and 2010, there was a slight increase in outbreak numbers primarily from Asia and Egypt. There were no newly affected countries reported during this period.

Since 2003, 63 countries/territories have experienced outbreaks of H5N1 HPAI. The last newly infected country was Bhutan in February 2010 (Figure 2b). Effective control measures for outbreaks in poultry have been associated with a reduced incidence of human infections in several countries. However, an apparent increase in outbreak numbers in poultry (Figure 2) during the H5N1 HPAI active periods (January to March) for the last three years (2009 to 2011) implies an increased risk of human infections in affected countries. The H5N1 virus has infected 565 people since it first appeared in 2003, killing 331 of them, according to WHO figures. The latest deaths occurred in early August in Cambodia, which has registered eight cases of human infection this year - all of them fatal. The increase in human case numbers (Figure 4) from 2010 to 2011 provides some support for this. Thus there is an urgent need to identify the drivers or factors responsible for the changes in the H5N1 HPAI situation globally and to understand newly emerging disease dynamics in endemic settings such as China, Vietnam, Egypt and Indonesia.

H5N1 HPAI continues to be a global threat for poultry and humans; therefore surveillance needs to be maintained by governments in poultry and wild bird species in endemic countries and countries at risk worldwide.

WORLDWIDE SITUATION: OBSERVED TRENDS

Over the last three months (July to September 2011), 131 H5N1 HPAI outbreaks in poultry were reported officially from the following countries: Bangladesh, Cambodia, Egypt, India, Indonesia, Iran and Viet Nam. One wild bird case was reported during the same period in Cambodia. See Figure 1. Analysis and interpretation of the HPAI data (as presented in this report) obtained through official reports is limited as the data on outbreaks in many endemic countries is incomplete. A number of endemic countries are currently implementing surveillance for H5N1 HPAI with assistance from FAO, the outputs of which are considered essential to understand the dynamics of H5N1 outbreaks in those endemic areas and consequent risks to poultry and humans.

Figure 2 presents the total number of H5N1 HPAI outbreaks/cases in wild birds and poultry reported globally since December 2003, classified by continent, and Figure 3 displays the number of countries reporting outbreaks/cases during the same period.

Since the start of 2011, a number of countries in Asia have experienced new virus introductions, particularly of virus clade 2.3.2.1, which in most cases involved wild birds. These include India, the Republic of Korea, Japan and Myanmar. Of those countries experiencing new virus introductions, Japan and the Republic of Korea have not reported outbreaks this quarter, having apparently eliminated the virus by applying stamping out policies. Bangladesh, which experienced a new introduction of virus clade 2.3.2.1 in 2010, has had continued reports of outbreaks during all three quarters of 2011, with apparent spill-over to poultry in India, as suggested by similarities in the genetic characteristics of viruses involved in both countries. Indonesia, Viet Nam and Egypt, where the disease is considered endemic, continued to report outbreaks in poultry with no new virus introductions. Clade 1.1 viruses, evolved from Clade 1, continue to circulate in the lower Mekong. Clade 2.1 variants, both in Indonesia and in new viruses introduced to Viet Nam, are now the dominant strains, replacing Clade 2.3.4. Virus clade 2.3.2 in its various forms is the main type in China, although Clade 2.3.4 has not disappeared.

Unlike during 2010, there were no reports of wild bird cases in northwest China, western Mongolia or the Russian Federation this year. The only case of a wild bird event was in eastern Mongolia in April. There were also no reports of human cases in China and Viet Nam, which may be attributable to lower levels of virus circulation in these two countries due to intensive vaccination campaigns reaching a wide bird population coverage and therefore a reduction of the level of virus circulating.

FIGURE 1

Map showing the location of H5N1 HPAI outbreaks/cases in poultry, H5 and H5N1 infection in wild birds and H5N1 infection in humans reported between July to September 2011. Insert shows a Bar chart of H5N1 HPAI outbreaks/cases in poultry and H5 and H5N1 infection in wild birds reported between July to September 2011. (Source: FAO EMPRES-i, OIE WAHIS)

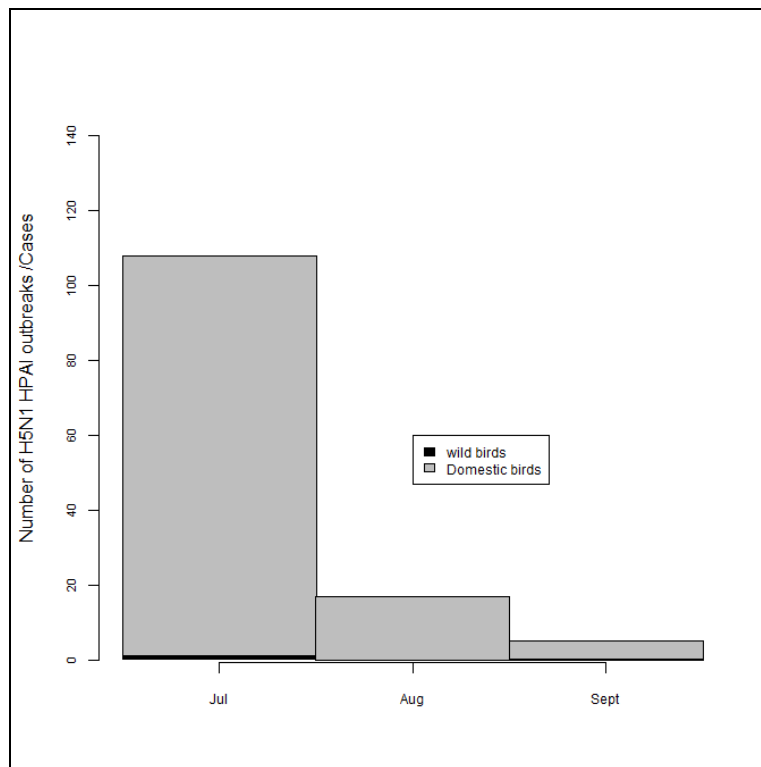
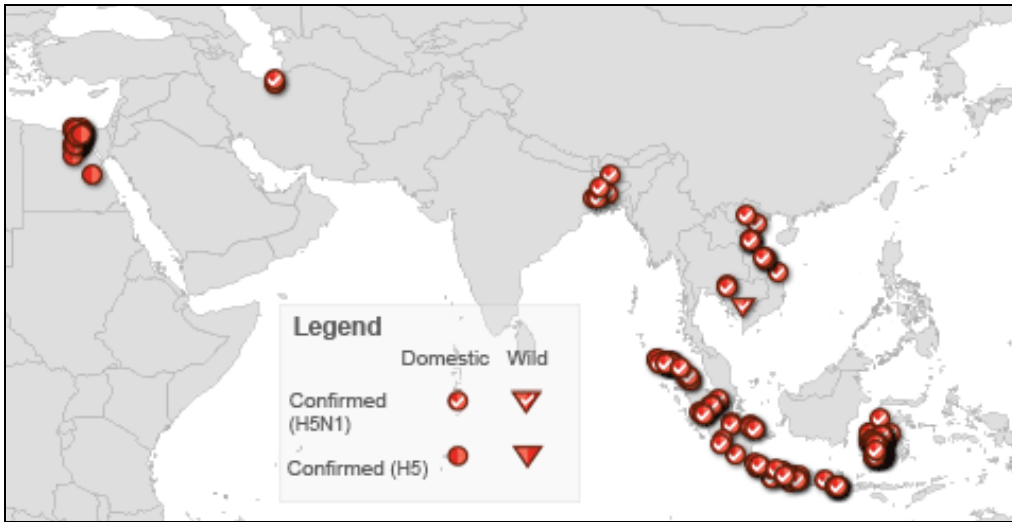


Figure 2

Epidemic curve showing: (a) the monthly and, (b) annual number of H5N1 HPAI outbreaks/cases reported between December 2003 and September 2011 classified by continent

(Source: FAO EMPRES-i, OIE WAHIS; Note 1: Indonesia data are not included in this graph, because the epidemiological unit definition for the PDSR data was modified from household level to village level in

May 2008 and is not comparable to global HPAI data); Note 2: * 2009 – 2010 refers to the period 1 July 2009 to 30 June 2010; Note 3: Months with more than 800 outbreaks have been truncated so that the rest of the graph is not distorted). The insert in figure 2a and 2b highlights outbreaks from July 2008 to June 2011. Data for H5N1 HPAI from Indonesia is displayed in figure 7.)

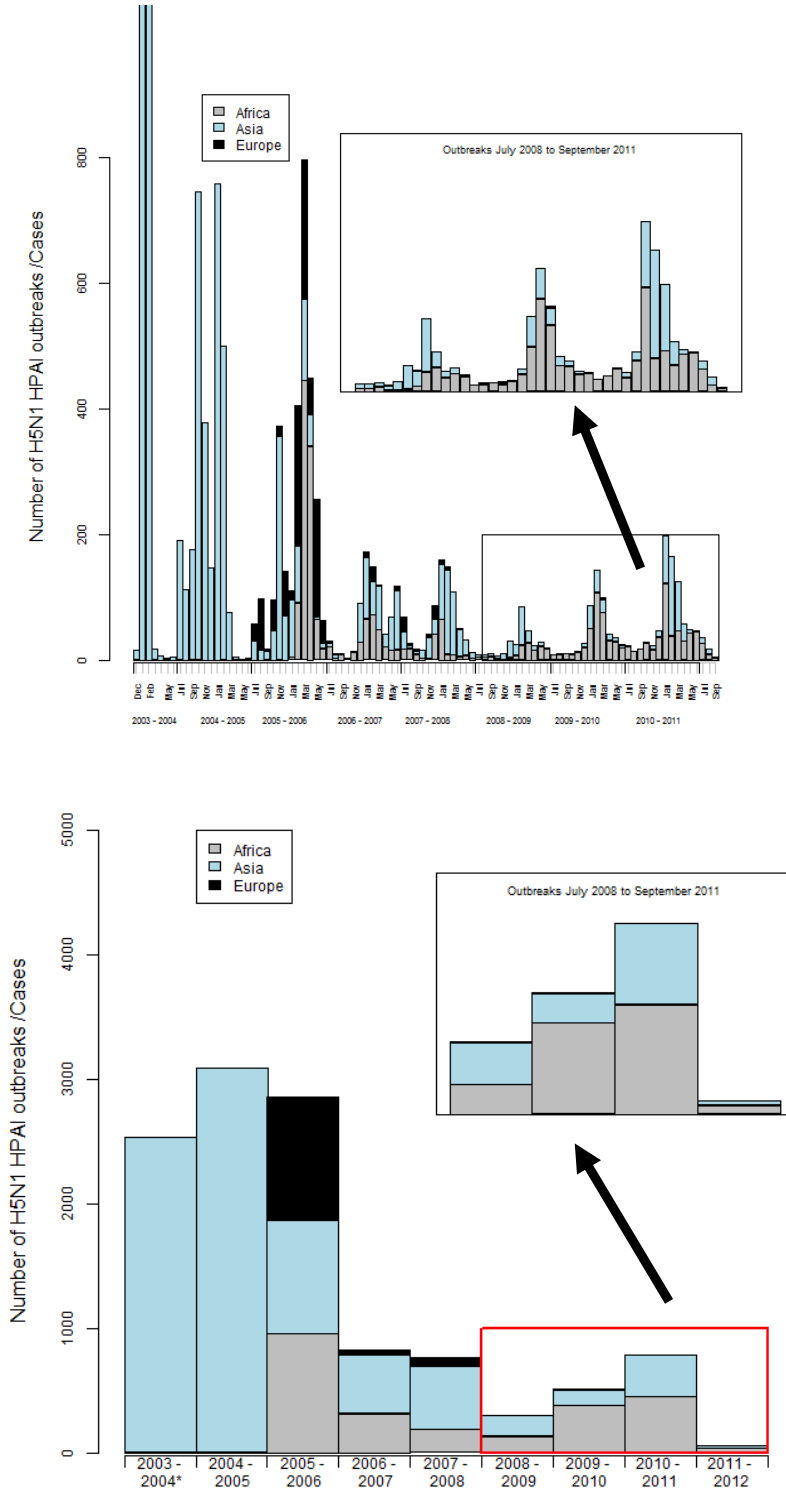


FIGURE 3

Number of countries that reported H5N1 HPAI outbreaks since December 2003 by continent, month and year. *Insert shows the number of countries infected (new, previous) between July 2008 and September 2011*
 (Source: FAO EMPRES-i, OIE WAHIS)

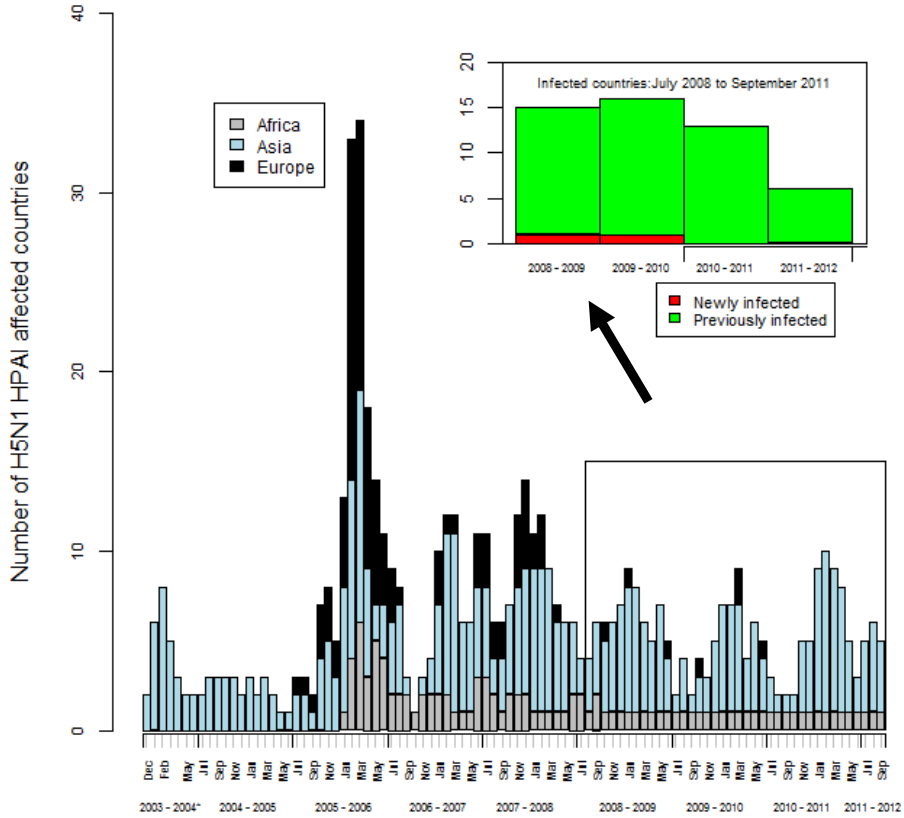
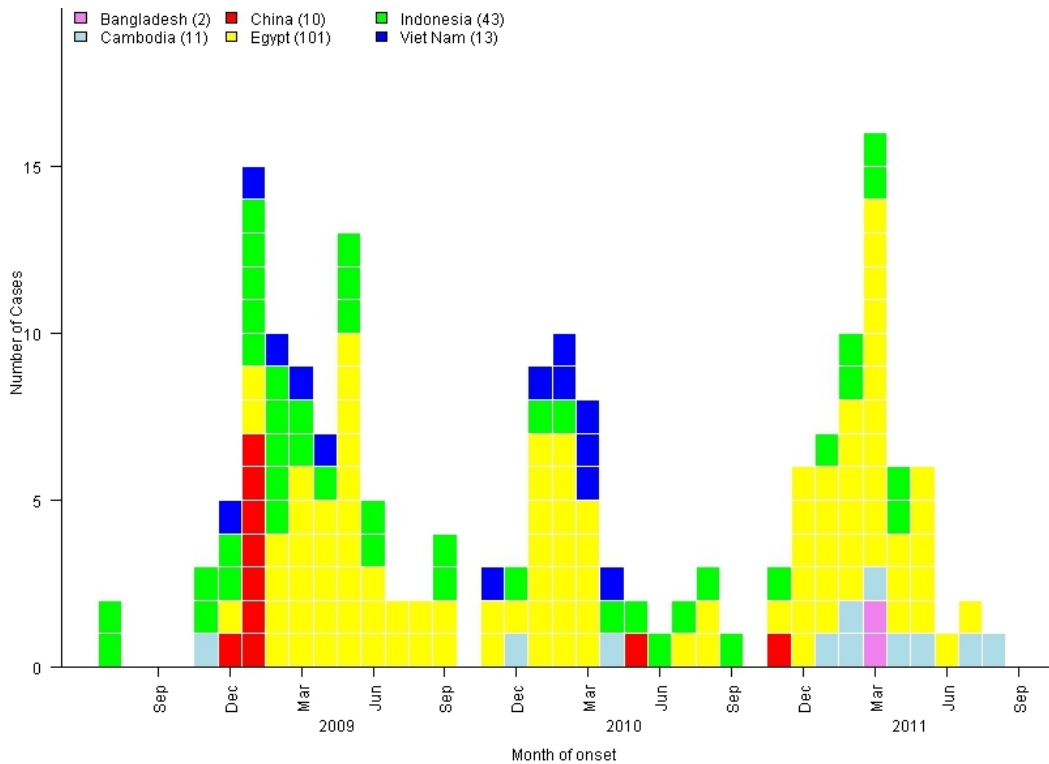


FIGURE 4

Cases of H5N1 AI infections reported in humans by country and month of onset from July 2008 to September 2011.
 (Source: World Health Organization - WHO)



SITUATION BY CONTINENT/REGION

Africa

Egypt reported 41 outbreaks during this period in poultry from 10 governorates, mostly from the household sector (29 out of 41). See Figure 4. These occurred mostly in flocks of unknown vaccination status (23 of 41, or 56 percent) and non-vaccinated flocks (17 out of 41, or 41 percent). Three of the 41 outbreaks were detected during visits to 100 villages by The Community Animal Health Outreach (CAHO) teams, which operate in high-risk governorates and collect samples only from suspected HPAI cases. None of the 2 342 samples tested as part of a regular pre-movement on farm testing were positive, and none of the 431 commercial poultry farms tested as part of the ongoing active surveillance were positive for H5 HPAI infection. Active surveillance in household poultry was also carried out in 1 778 villages where 23 samples in ten governorates were found positive for H5 HPAI. Only one out of four suspected outbreak notifications from commercial farms were confirmed positive for H5 HPAI, while 3 of the 74 suspected outbreak notifications from households were confirmed positive for H5 HPAI. Out of 11 samples collected at road check points, one tested positive for H5 HPAI. Ten out of 135 samples collected from Live Bird Markets (LBM) in two governorates were confirmed positive for H5 HPAI infection as part of targeted surveillance activities in LBM. Recently, the veterinary authorities (GOVS) announced that since May 2011, eight tested cases for H9 influenza virus in commercial farms were confirmed positive in four governorates.

One non-fatal human avian influenza (AI) type A H5N1 case was confirmed during the three-month period. This increases the human confirmed cases in Egypt since 2006 to 151; 52 (34 percent) have been fatal. While most cases in 2009 were in children under four years of age, since this sub-population is normally taking care of poultry in households, in 2010, 78% of human infections have been reported in patients above that age. The case fatality rateFR in 2010 is higher than in 2009 (43 percent vs. 10 percent), but similar to the CFR reported in 2008 (50 percent).

Egypt first reported outbreaks of H5N1 HPAI in poultry in February 2006. Despite a vigorous initial response to the disease, including the culling of over 40 million birds and vaccination being introduced, Egypt is considered an endemic country where outbreaks are regularly reported from different governorates. Circulating viruses belong to Clade 2.2.1 and cluster in two major genetic groups, indicating that there have been no new introductions of H5N1 viruses since 2006. The work on gene sequencing indicates that currently there are two major groups of A/H5N1 viruses: i) The group which is closely related to the originally introduced viruses and is circulating mainly in household poultry flocks; and ii) the variant group that has emerged in late 2007 and that is circulating mainly in commercial poultry farms. In 2010, the latter group (variant group) has been further divided into two minor subgroups (1 and 2). A new clade nomenclature for avian influenza viruses has been decided. This indicates the continued presence of Clade 2.2.1.1 in the commercial poultry sector, implying further evolution of clade 2.2.1 in Egypt.

http://www.who.int/influenza/resources/documents/2011_09_h5_h9_vaccinevirusupdate.pdf

South Asia

In July, August and September 2011, **Bangladesh** experienced four outbreaks of H5N1 HPAI in poultry. The virus clade (s) involved in these outbreaks is currently unknown. Virus clades from outbreaks between April and June belonged to clade 2.3.2.1 and 2.2.2. The virus isolates from the 2010 outbreaks belonged to Clade 2.2, sublineage III and clustered with sequences of viruses from Bangladesh isolated from 2007 to 2009. This provides supporting evidence that the same virus is being maintained unnoticed within the country. However, a new incursion of clade 2.3.2.1

was confirmed for the first time in Bangladesh in crows and chickens in January and February 2011 and is now the dominant strain with spillover into India. Clade 2.3.4.2 was identified from poultry in February 2011 in Potiya Upazila, Chittagong District.

The emphasis of the current policy of the government is placed on early detection and containment by culling, as well as the improvement of biosecurity in various production sectors. Poultry vaccination against H5N1 HPAI is officially prohibited. Over 2.4 million birds have been culled and over 3.1 million eggs destroyed since 2007. FAO is coordinating and supporting active surveillance that has been expanded to 306 upazilas (sub-districts) across the country, including the innovative use of the Short Message Service (SMS) gateway (method of sending and receiving SMS messages between mobile phones and a central server) as a reporting tool. Daily, in each upazila, avian influenza workers (AIWs) (formerly called "community animal health workers", CAHW) employed by the active surveillance programme send SMS coded text messages to the Department of Livestock Services, regardless of the presence or absence of disease and deaths in poultry. SMS messages of suspected HPAI events are automatically forwarded to the livestock officer in the area, who will respond by initiating an investigation. In July, August and September (until the 25th), 26 436, 24 832 and 20 612 SMS messages were received, respectively, including 70 suspected HPAI events in backyard poultry and 354 suspected events in commercial poultry farms. The veterinary investigations that followed excluded 424 of these suspect cases, and on 29 occasions, diagnostic specimens were collected. Of all specimens collected and reported through the SMS gateway system, four (4) tested positive for H5N1 HPAI.

As of 25 September 2011, a total of 524 outbreaks were recorded in 52 out of 64 districts. These include 31 outbreaks in 2010, 32 in 2009, 226 in 2008 and 69 in 2007. Out of these outbreaks, 467 occurred in commercial poultry farms and 57 in backyard poultry.

In India, two outbreaks of H5N1 HPAI occurred in late August and early September 2011. The two outbreaks occurred in backyard poultry in eastern Indian states bordering Bangladesh. The first outbreak was in the State of Assam and the second in West Bengal. Given the distance between the two states and outbreak locations, it is unlikely they are directly connected. High mortality occurred in both areas.

Samples taken from the two affected states tested by the High Security Animal Disease Laboratory, Bhopal (HSADL), confirmed the presence of HPAI H5N1 infection. The virus clade is currently unknown. Stamping out of all domestic poultry is being undertaken in an approximately 3-km radius around the outbreak area accompanied by intensive surveillance in a 10-km radius, including closure of poultry markets and prohibition on sale and transport of poultry in the infected zone.

These two outbreaks of H5N1 HPAI differ from the two earlier outbreaks in India that occurred in February and March 2011, as they were in commercial farms (one a duck breeding farm) and in a different state – Tripura. However, all three affected states – Assam, West Bengal and Tripura – border Bangladesh. The virus clade involved in this last outbreak was 2.3.2.1.

Sero-surveillance activities conducted at HSADL are periodically reported at <http://www.dahd.nic.in/>, including the number of samples received and tested per state.

The Ministry of Environment and Forests of the Government of India and the Department of Wildlife and Forests of Uttar Pradesh are continuously funding the sampling of wild water birds. Laboratory results are pending.

FAO facilitated a migratory waterfowl satellite tracking project in January 2010 and the flight paths can be found at (<http://www.werc.usgs.gov/Project.aspx?ProjectID=60>).

FIGURE 5
 H5N1 HPAI outbreaks in poultry in Egypt between June 2009 and September 2011
 (Source: FAO EMPRES-i; * 2009 – 2010 refers to the period 1 July 2009 to 30 June 2010)

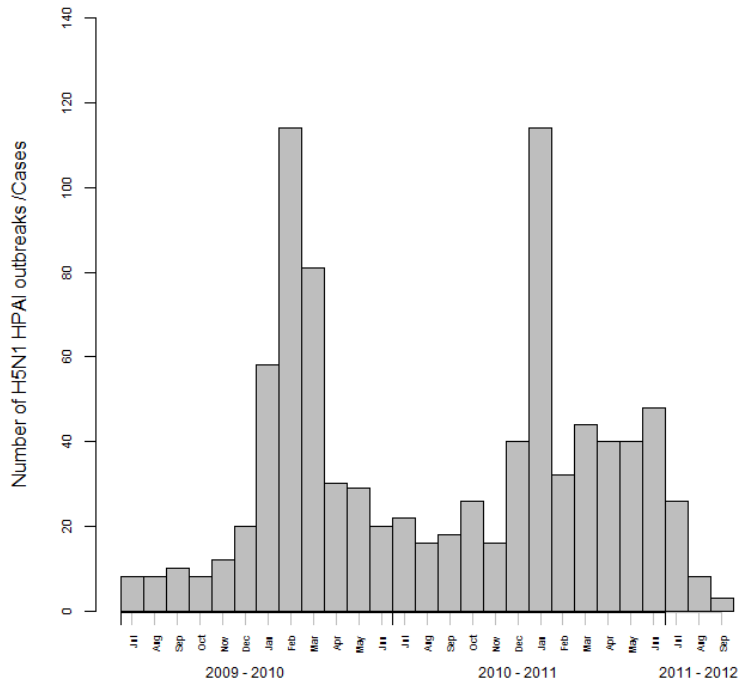
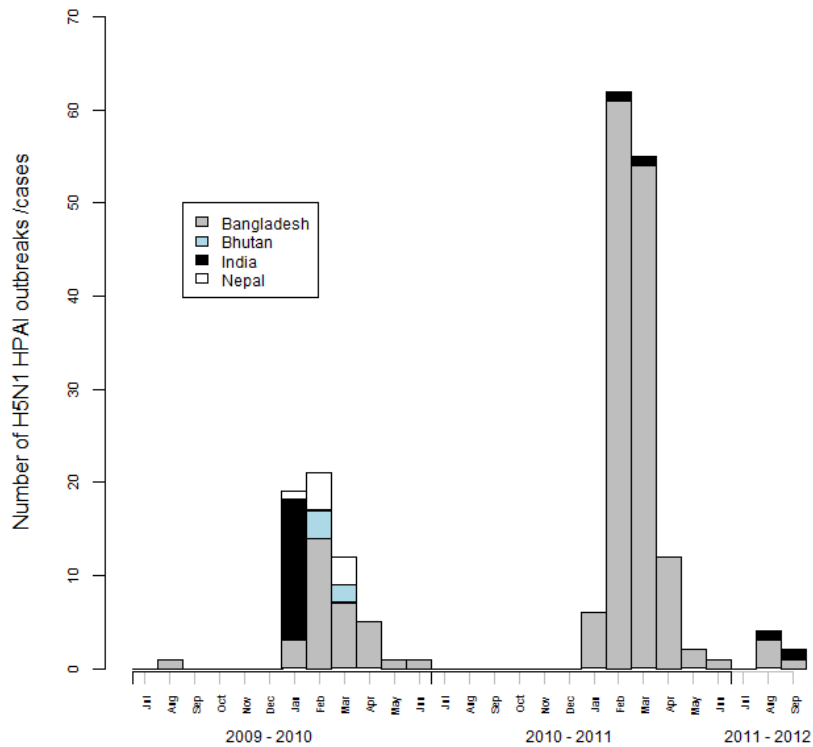


Figure 6
 H5N1 HPAI outbreaks/cases reported in poultry, H5 and H5N1 infection in wild birds in South Asia, by country, between July 2009 and September 2011
 (Source: FAO EMPRES-i; * 2009 – 2010 refers to the period 1 July 2009 to 30 June 2010)

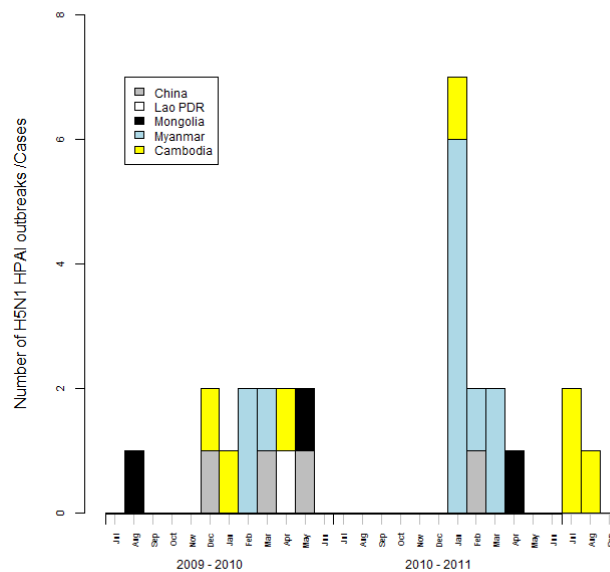


Southeast and East Asia

Three outbreaks of HPAI H5N1 in poultry and one wild bird event at a zoo were reported in **Cambodia** during this reporting period. There were also two human cases of H5N1 infection reported. All three poultry outbreaks occurred in Banthey Meanchey Province. One of the three poultry outbreaks occurred near the location of one of the human

H5N1 cases reported in July. In this period, one human case was observed prior to observation of outbreaks in poultry. H5N1 HPAI-related events in humans and poultry were previously reported during the first two quarters of 2011. The virus clade involved in these recent events is clade 1 (source Institute Pasteur Cambodia, IPC). All available human and animal isolates since 2004, including all those from 2010 and the first two quarters of 2011 are Clade 1.1 and are most closely related to Clade 1 viruses previously circulating in Cambodia.

Figure 7
H5N1 HPAI outbreaks/cases in poultry, H5 and H5N1 infection in wild birds in East and South East Asia, by country (excluding Indonesia and Viet Nam), between June 2009 and September 2011.
*(Source: FAO EMPRES-i; * 2009 – 2010 refers to the period 1 July 2009 to 30 June 2010)*



This is also the same virus clade which circulates predominantly in southern Viet Nam, which could be explained by transboundary movement of animals and animal products between these two countries.

Cambodia routinely reports results obtained from surveillance activities through two hotlines (supported by FAO until February 2010) at the National Veterinary Research Institute (NaVRI). There is also ongoing duck market surveillance at eight live bird markets (LBMs) in five provinces and sentinel duck flock surveillance in six provinces. Both duck surveillance efforts are conducted by NaVRI (and supported by FAO). A joint FAO, NaVRI and IPC environmental surveillance project in four markets just ended. Results will be available in the next quarterly report.

In **mainland China**, there were no reports of outbreaks or cases of H5N1 HPAI in poultry or wild birds or human infections between July and September 2011. This may be explained by the massive use of vaccination against H5N1 HPAI in poultry in China, which is reducing the virus load in infected poultry and therefore no clinical signs were observed through routine surveillance activities.

Though there were no outbreak reports during the first three quarters of 2011, ongoing active surveillance in live bird markets in seven (7) provinces resulted in 10 virus positive birds in June, (this is the second month with positive reports this year), implying that H5N1 viruses are still circulating in many provinces in domestic poultry and disease outbreaks unnoticed by the authorities. A total of 49 706 samples were collected and tested in June, and the positive samples

came from Chongqing, Guangdong, Guangxi, Hubei, Hunan, Fujian and Zhejiang provinces (chickens, ducks and geese).

There were no more reports or detections of HPAI H5N1 virus in wild birds or poultry since the last reported case dated 1 March 2011 in **Hong Kong (SAR)**. None were reported in the northwestern part of China, breaking a chain of repeated reports since 2005.

China first identified HPAI viruses of the H5N1 subtype in 1996 in geese in Guangdong Province, and these viruses have continued to circulate and evolve over time. Almost 200 H5N1 HPAI outbreaks have been reported in poultry, with H5N1 and H5 infection in wild birds in 29 provinces since 2004, and over 35 million poultry have been culled to control the spread of the disease. Since 2004, there has been a marked decrease in the number of reported outbreaks in domestic poultry. Despite this decrease, official ongoing active surveillance activities conducted nationally have repeatedly found H5N1 positive samples, providing evidence that H5N1 viruses are still circulating in many provinces in domestic poultry.

Mass vaccination against H5N1 HPAI has been implemented since November 2005. Though data is not available for the current reporting period, post-vaccination sero-surveillance during the period April until June 2011 showed that out of 1,671,467 post-vaccination samples, 1,513,183 (90.53%) were sero-positive. Avian influenza vaccines are produced nationally by ten manufacturers. Vaccines are provided to commercial poultry farms and backyard poultry breeders by the government at no cost. The government is developing a new vaccine antigen, because immunity produced by existing

antigens against existing Clade 2.3.2.1 does not provide optimal protection.

No human cases were reported between July and September 2011. China has reported 40 human cases, of which 26 (65%) were fatal since the beginning of the epidemic.

All the clades of Asian-lineage H5N1 HPAI virus found globally have been detected in China. Of particular interest is the recent expansion of Clade 2.3.2, which was originally detected from a dead Chinese pond heron in Hong Kong SAR in 2004, and which has now expanded its geographic range to include Mongolia, the Russian Federation, Nepal, Romania and Bulgaria. In Hong Kong SAR, viruses from Clade 2.3.4 were also detected in wild birds and poultry in 2009. The study by Kou et al. (2001) provides some information on virus clades isolated from wild birds in China between April 2004 and August 2007, which can be found at <http://www.plosone.org/article/info:doi%2F10.1371%2Fjournal.pone.0006926>.

Indonesia continues to report a high proportion of H5N1 HPAI outbreaks in poultry compared to the rest of the world (Figure 8), as it has for the past three years. H5N1 HPAI Clade 2.1 is confirmed to be endemic on the islands of Java, Sumatra and Sulawesi, and probably Bali, with sporadic outbreaks reported elsewhere. H5N1 HPAI prevalence by village varies widely. Only one of Indonesia's 33 provinces has never reported the occurrence of H5N1 HPAI. The high number of reports each month is partially explained by the implementation of the Participatory Disease Surveillance and Response (PDSR) programme that targets village poultry production systems (mainly backyard) and reports evidence of virus circulation in village poultry. The programme is supported by FAO with USAID and AusAID financial support and is operating in 385 of 496 (77 percent) districts through 33 Local Disease Control Centres (LDCCs) in 29 (88 percent) of 33 provinces in Java, Sumatra, Bali, Sulawesi and Kalimantan, including all known endemic areas; however, the quality and intensity of surveillance is not the same in all districts. Larger and less densely-populated provinces report HPAI outbreaks less often than more densely populated provinces.

During July 2011, PDSR officers visited 1,841 villages, of which 144 (7.8 percent) were infected. Of these, 123 were new infections. In August 2011, PDSR officers visited 1,225 villages, of which 80 (6.5 percent) were infected. Of these, 64 were new infections. During the previous 12 months (August 2010 to August 2011), 18 539 (25.8 percent of 71,996 villages) were visited in the 385 PDSR surveillance districts. Since August 2008, PDSR officers have visited approximately 58.3 percent of villages under coverage. Approximately 8.4 percent of villages visited during the previous 12 months

were classified as newly infected. Cases over the past 12 months were concentrated in Sumatra, Java, Bali and Sulawesi.

The Indonesian Government introduced vaccination in small flocks in mid-2004. Vaccines containing either an Indonesian H5N1 antigen (e.g. A/chicken/Legok/2003) or H5N2 viral antigen have been used in government programmes and there are now approximately 20 different licensed vaccines. Vaccination programmes by the central government in the backyard poultry sector were implemented until 2008, when they stopped as a result of concern over the efficacy of registered vaccines. In the commercial sectors, vaccination is not coordinated by government, thus vaccination practices are based on risk as perceived by the farmer. Today, preventive vaccination is practiced in all breeder facilities and on nearly all layer farms nationwide. Single dose vaccination of broilers with inactivated vaccine is practiced sporadically during the wet season on Java. Ducks are usually not vaccinated against HPAI H5N1 in Indonesia as current circulating strains of the virus are of very low pathogenicity for ducks. While ducks may act as a reservoir for the disease by being asymptomatic carriers, the prevalence of infection is generally very low.

In **Mongolia**, no H5N1 HPAI events were reported during the July to September 2011 period. One wild bird HPAI event was previously reported in April 2011 in Whooper swans (*Cygnus cygnus*) at Zegst Lake. The clade information of this event in wild birds is unknown. Phylogenetic analyses of the 2010 wild bird isolates placed them in the 2.3.2 Clade.

The **Republic of Korea** reported no outbreaks or events in domestic poultry or wild birds during this period. Previous detection of domestic and wild bird HPAI events occurred from November 2010 until March 2011. Viruses involved in the 2010 and 2011 poultry outbreaks and wild bird events were clade 2.3.2.

In **Viet Nam**, during the three-month reporting period, the Department of Animal Health officially reported 12 HPAI outbreaks in the north (two provinces) and central (three provinces) of Viet Nam. See Figure 9. No human cases were officially declared during this period. In Viet Nam, H5N1 was first identified in poultry in 2003 and in humans in 2004. Disease control measures include stamping out on infected farms, movement restrictions for 21 days, compensation and vaccination. Viet Nam has temporarily halted government-sponsored vaccination in 2011 in view of emergence of a new clade of H5N1 virus in outbreaks reported from north and central Viet Nam with an antigenic variant against which the vaccine in use was found to be ineffective. However, it is maintaining some emergency stock of vaccine for use in south Viet Nam.

Figure 8
H5N1 HPAI outbreaks in poultry in Indonesia (compared to the rest of the world)
between July 2009 and September 2011.
 (Source: GoI/ECTAD Indonesia and EMPRES-i; * 2009 – 2010 refers to the period 1 July 2009 to 30 June 2010)

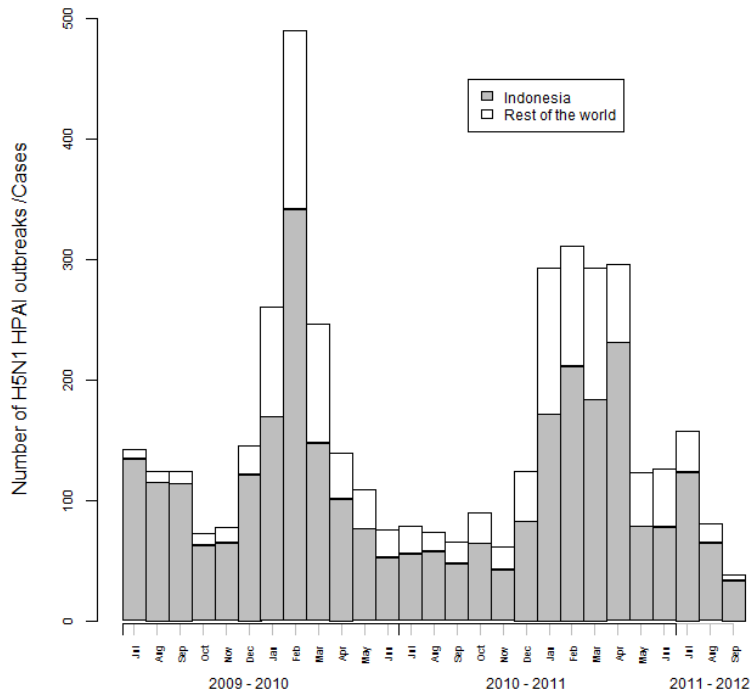


Figure 9
H5N1 HPAI outbreaks in poultry in Viet Nam, between June 2009 and September 2011
 (Source: FAO EMPRES-i; * 2009 – 2010 refers to the period 1 July 2009 to 30 June 2010)

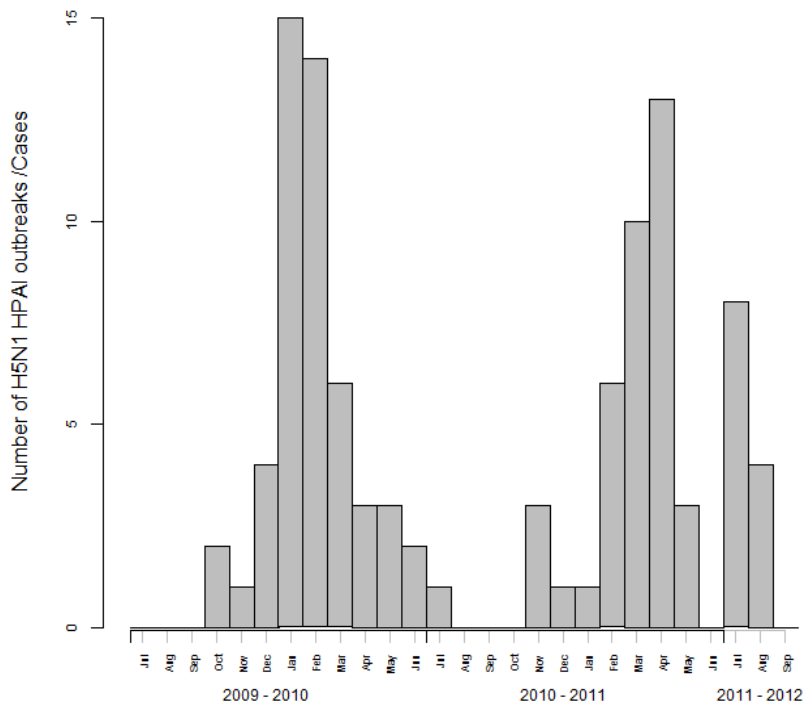
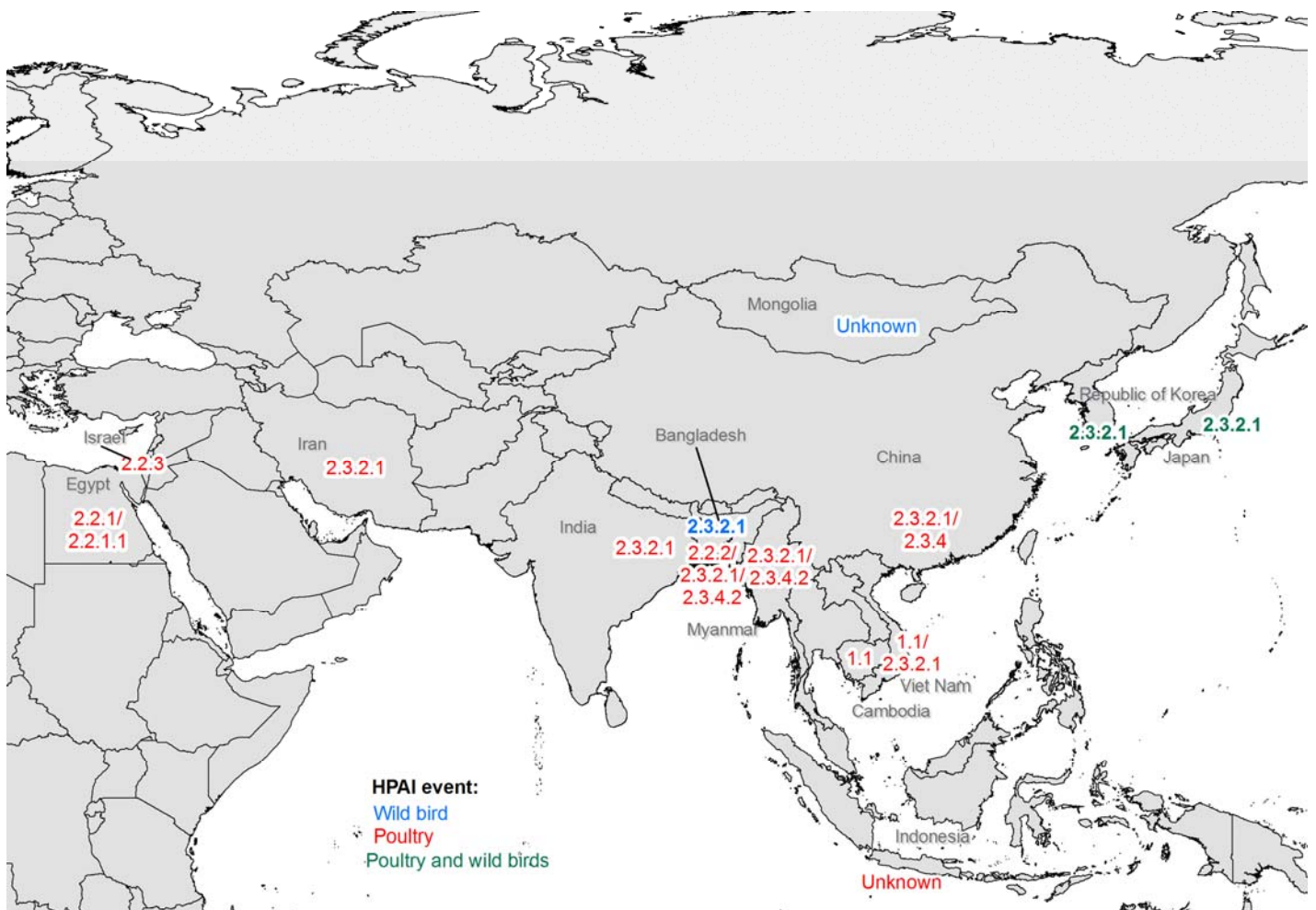


Figure 10
Geographic distribution of circulating virus clades globally in poultry and wild birds reported between February and September 2011.



Surveillance and molecular genetics have indicated the presence of four circulating virus clades in Viet Nam since 2003. These are: (1) Clade 1 (predominant in southern Viet Nam from 2004 to 2010); (2) Clade 2.3.4 (predominant in northern Viet Nam from 2007 until the first half of 2010.); (3) Clade 7 (detected in poultry seized at the Chinese border and at markets near Hanoi in 2008); and (4) Clade 2.3.2 (detected in 2005 for the first time and having reappeared in late 2009). Virus clade 2.3.2 has become predominant in the north Viet Nam since late 2010. It was also detected in the central-south region in 2010. In a vaccine efficacy trial, it was observed that the current vaccines in use in Viet Nam provided poor protection against one particular virus strain within virus clade 2.3.2, detected for the first time in early 2011 from one province in North Viet Nam. This virus strain forms a distinct cluster from most of the other virus strains of clade 2.3.2 in the HA gene phylogeny. This particular variant strain of H5N1 virus has been detected from five (5) northern provinces of Viet Nam so far in 2011.

The FAO/USAID-funded Gathering Evidence for a Transitional Strategy for Highly Pathogenic Avian Influenza (HPAI) H5N1 Vaccination in Vietnam (GETS) Project has provided crucial epidemiological evidence of H5N1 HPAI through a longitudinal sentinel study, two market surveys and a modified post-vaccination monitoring programme carried out in five provinces of Vietnam. The sentinel study, which monitored 244 flocks during a period of over one year, detected H5N1 infection rate of 1.1 percent. This study also showed differences in H5N1 detections between the Red River area and the Mekong provinces; H5N1 infections in the Red River

were only detected at the start of the project (December 2009 – January 2010), whereas in the Mekong provinces, infection was detected all year round. In most cases, infection occurred without concomitant clinical signs, which limits a farmer's ability to detect possible H5N1 HPAI based on clinical surveillance. Results from the market surveys carried out in January and May 2011 testing pools of 5 ducks (oropharyngeal and cloacal swabs combined) (1,248 pools on each survey) resulted in an overall H5N1 pool prevalence of 4.5 percent (January) and 2.1 percent (May). No evidence of H5N1 was detected in the two Red River Delta provinces surveyed, but in the Mekong provinces, the pool prevalence was 9 percent and 4.3 percent in the surveys.

Middle East

In **Israel**, no new outbreaks of H5N1 HPAI were reported during the period July to September 2011. The last H5N1 HPAI outbreaks occurred in March 2011 in poultry and was associated with clade 2.2.1 virus isolates. The last positive H5N1 HPAI finding prior to this was in April 2010, when two emus at a mini-zoo of a Kibbutz in Hadarom tested positive. Sequence data available within Genbank for a virus isolated from an earlier outbreak in breeder pullets in Haifa in January 2010 indicated that the virus was closely related to viruses of clade 2.2 from Egypt. This could indicate informal trade between borders of live poultry and products is an important means of HPAI incursion in Israel.

No new outbreaks of H5N1 HPAI were reported in the **West Bank and Gaza Strip** in the July to September 2011 period.

Previous HPAI events occurred in poultry and wild birds in March and April 2011, respectively. The previous outbreak in domestic poultry was associated with virus clade 2.2.1.

Iran confirmed the re-occurrence of H5N1 HPAI in poultry during September, approximately three years since the last outbreaks were reported (2008). Two outbreaks were confirmed in free-ranging duck flocks in the northernmost province of Iran facing the Caspian sea. These outbreaks were associated with virus clade 2.3.2.1. A stamping out policy has been applied to control the two outbreaks. Vaccination against H5N1 HPAI is prohibited in Iran.

Eastern Europe

The last wild bird event in Europe was reported in the **Russian Federation** in June 2010, when 367 wild birds were found dead in Ubsu-Nur Lake, in the Tyva Republic. Genetic analysis at the All-Russian Research Institute for Animal Health (ARRIAH) in Vladimir determined that the isolate belonged to Clade 2.3.2 of the Asian lineage A/Guandong/1/96 and is 99% similar to the 2009-2010 H5N1 isolates from wild birds in Mongolia, Tyva and Qinghai.

Prior to this, H5N1 activity was reported on the Black Sea coast, with two outbreaks in backyard poultry in **Romania** and one positive case in a common buzzard in **Bulgaria**. Isolates from both countries grouped in the 2010 virus Clade 2.3.2.1 and were 99.3 percent identical and 99.3 percent similar to viruses isolated recently from poultry in Nepal. Prior to April 2010, the last H5N1 HPAI event in poultry had been detected in October 2008 on a mixed poultry farm in Germany.

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This overview is produced by the EMPRES/GLEWS team in FAO, which collects and analyses epidemiological data and information on animal disease outbreaks under the framework of the Global Early Warning System for Major Animal Diseases including Zoonoses.

EMPRES/GLEWS welcomes information on disease events or surveillance reports on H5N1 HPAI (and other TADs) both rumours and official information. If you want to share any such information with us please send a message to glews@fao.org. Information will be treated confidentially if requested.