



ARIF ARIADI

Laboratory training session
in Indonesia

EMPRES mandate

The vision of the EMPRES-Livestock diseases component is to promote the effective containment and control of the most serious epidemic livestock diseases as well as newly emerging diseases, by progressive elimination on a regional and global basis through international cooperation involving early warning, early/rapid reaction, and by enabling research and coordination.

Sample collection and morphometrics at Pantanos de Villa Wildlife Reserve in Lima, Peru

HPAI spreads further west...

Since the start of the epidemic of highly pathogenic avian influenza (HPAI) in several countries in Southeast and East Asia in late 2003 and early 2004, the disease has spread rapidly to other countries in Europe, the Near East and Africa in early 2006 ...



ENRIQUE SAMUDIO

AND...

HPAI: global situation, 2006

Emergency Centre for Transboundary Animal Diseases (ECTAD)

Crisis Management Centre (CMC) to handle food-chain emergencies

Global Early Warning System (GLEWS)

OFFLU: Joint OIE/FAO worldwide scientific network for avian influenza

Joint FAO/IAEA programme helps members in their fight against HPAI

FAO/OIE International Scientific Conference on Avian Influenza and Wild Birds

FAO in the field ...

AU-IBAR Strategy for the Prevention and Control of HPAI in Africa

Stop the Press



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Poultry farm in Indonesia

FAO-EMPRES response

Because of the potential spread of HPAI through trade and potentially along migratory bird flyways to the Near East and Africa, Technical Cooperation Programme projects have been launched. These will strengthen the capacity to generate and share HPAI disease information and use this information to mount emergency-preparedness planning against the eventuality of HPAI being introduced into the region, or beyond.



EMPRES mandate

EMPRES focuses on emergencies of a transboundary nature

Fighting hunger is not only about producing more food. It also means protecting livestock from diseases and preventing them from spreading across borders. That's why in 1994 FAO established the Emergency Prevention System for Transboundary Animal and Plant Pests and Diseases (EMPRES).

Transboundary animal diseases (TADs)

Transboundary livestock diseases are "those that are of significant economic, trade and/or food security importance for a considerable number of countries; which can easily spread to other countries and reach epidemic proportions; and where control/management, including exclusion, requires cooperation between several countries".¹

EMPRES-Livestock vision

The EMPRES-Livestock vision is to promote the effective containment and control of the most serious epidemic livestock diseases as well as newly emerging diseases by progressive elimination on a regional and global basis through international cooperation involving early warning, early/rapid reaction, and by enabling research and facilitating coordination.

As the world shrinks increasingly to a global village, this mission grows more significant every day – diseases recognize no borders. The EMPRES mandate is transboundary in nature, but EMPRES principles apply equally well to emergencies *within* national borders. FAO hopes, therefore, that EMPRES resources will be of assistance whatever the animal-disease emergency.

While FAO's EMPRES-Livestock programme continues to play a major role in the fight against persisting and/or spreading transboundary animal diseases (TADs) at a global level, the emphasis is on developing countries. One important aspect of EMPRES is the Global Rinderpest Eradication Programme (GREP). This has advanced to a stage that Asia and Africa have now been free from rinderpest for an extended period of time. In addition to combating rinderpest, EMPRES also runs normative and operational activities on the containment and progressive control of various other serious transboundary diseases – such as contagious bovine pleuropneumonia (CBPP), Rift Valley fever (RVF), *peste des petits ruminants* (PPR), foot-and-mouth disease (FMD), lumpy skin disease (LSD), classical swine fever (CSF), African swine fever (ASF), haemorrhagic septicaemia (HS), and highly pathogenic avian influenza (HPAI), among others.

¹ Source: <http://www.fao.org/DOCREP/004/W3737E/W3737E08.htm>

Highly pathogenic avian influenza (HPAI): global situation, 2006

Since the beginning of the epidemic of highly pathogenic avian influenza (HPAI) in several countries in Southeast and East Asia in late 2003 and early 2004, the disease has spread rapidly to other countries in Europe, the Near East and finally to Africa in early 2006. The disease continues to be found in Asia, and there are now more than 50 countries where HPAI subtype H5N1 has been found in domestic and/or wild bird populations.

Figure 1: HPAI outbreaks reported in poultry and wild birds, 2004–2006

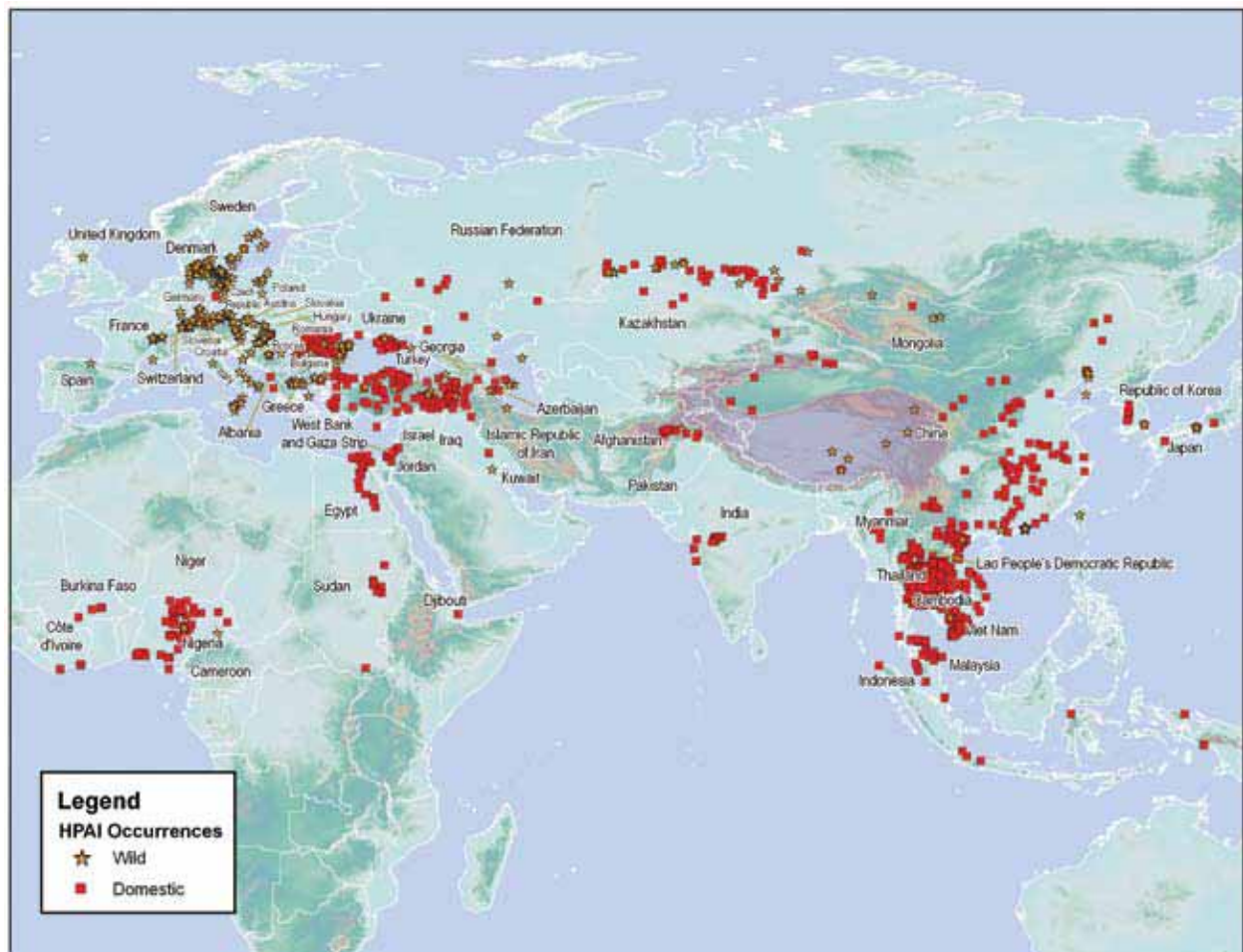
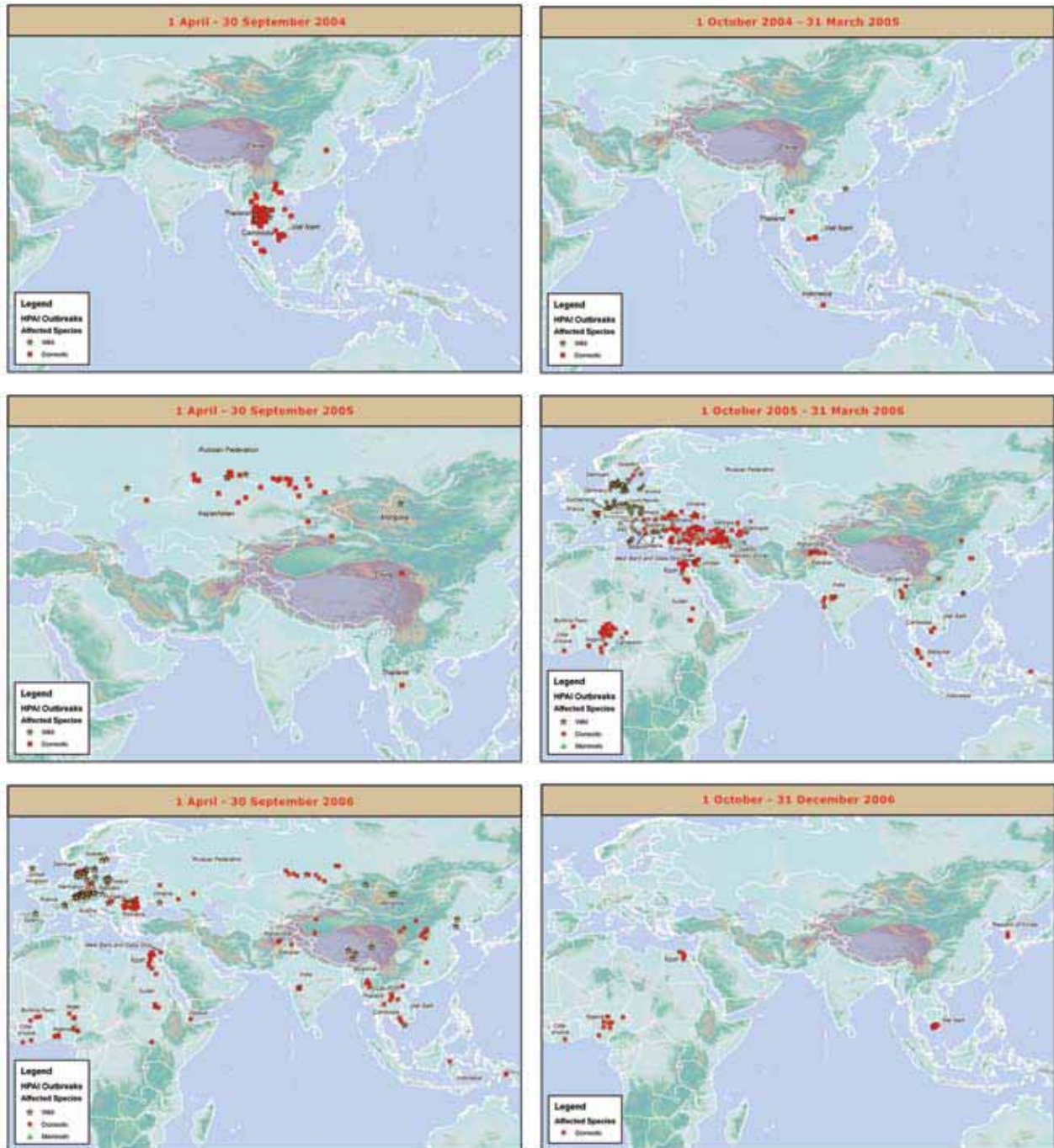




Figure 2: Sequence of maps representing HPAI outbreaks reported in poultry and wild birds, 1 April 2004–31 December 2006, divided by periods of six months



Asia

The first outbreak of H5N1 HPAI in Asia was reported from the Republic of Korea on 10 December 2003. Within one month after the declaration, eight other countries in the region confirmed outbreaks. The disease was subsequently detected in Afghanistan, Cambodia, China, India, Indonesia, Japan, Kazakhstan, Lao People's Democratic Republic, Malaysia, Pakistan, Thailand, Viet Nam and is still found in poultry in several of the countries. Local spread has occurred in all the countries. In none of these has the original source of the virus been declared. In some countries, the disease has remained relatively localized, with the spread and problem greatest in Indonesia.



APHALUCK BHATASEVI

Live bird market, Viet Nam

Indonesia

Since 2003 H5N1 HPAI has spread across Indonesia and has now been confirmed in 30 of its 33 provinces. In 2006, HPAI continued to spread and was reported in the previously disease-free eastern provinces of West Irian, Papua, and north and central Sulawesi. Surveillance data show that HPAI is endemic in Java, Bali, much of Sumatra and in south Sulawesi; little information is available from other areas.

Human cases occurred continually throughout 2006 and 2007 and Indonesia now has the highest number of fatalities globally.

FAO is supporting the Government of Indonesia's programme to control HPAI progressively by providing technical and policy advice and programme management.

Vaccination in Indonesia

Indonesia is one of four Asian countries (with China, Viet Nam and Pakistan*) to vaccinate against avian influenza. Vaccination of flocks was chosen instead of mass culling because of the cost. Java, with 80 percent of the country's livestock, is so crowded and the disease so prevalent that a rigorous culling campaign would have wiped out virtually all the poultry on the island. Vaccination should only be used in non-infected flocks, and part of a greater campaign for improved disease management.

* Pakistan is currently using vaccination against H7 and H9 viruses.



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Veterinarian paraprofessionals vaccinating young ducks against avian influenza on a farm, Viet Nam



APHALUCK BHATIASEVI

FAO is also implementing a community-based, participatory disease-surveillance and response programme. This programme now operates in 103 out of 444 districts across most of Java, Bali and parts of Sumatra. Data from this programme underline how widespread and common HPAI has become, and indicate how community participation can contribute to an overall government-surveillance programme.

Viet Nam

Until mid-2005, the Government of Viet Nam applied a “stamping-out” policy in a sustained attempt to control HPAI. When persistent outbreaks in 2005 necessitated a change in strategy, AI vaccination was adopted on a nationwide scale. The vaccination programme was conducted within a regime of strict zoosanitary-procedure enforcement. Following completion of the first campaign, there were no reported AI outbreaks. In addition, since its inception, no human cases have been reported.

During this period the government approved a five-year multisectoral strategy – the Integrated National Operational Program for Avian and Human Influenza (2006–2010). All FAO Viet Nam’s AI projects are aligned with this strategy, with funding currently from the United States Agency for International Development (USAID), Japan, Ireland and via the “Joint Government-UN Programme” which has just begun a second phase of implementation.

However, after almost a year of no reports of the disease, on 19 December 2006 the Department of Animal Health announced the confirmation of H5N1 HPAI in the Ca Mau and Bac Lieu provinces.

According to government reports, this latest wave of outbreaks involved many illegally raised (thus unvaccinated) duck flocks – resulting in a delay in reporting. Duck raising – especially the traditional widespread “free-range” system on rice paddies – is an important means of income for rural populations. While it would be unrealistic to discontinue this type of farming, it is vital that enhanced surveillance be applied to this high-risk sector and that vaccination is a key control used in future.

More information available at: http://www.avianinfluenza.org.vn/index.php?option=com_remository&Itemid=41&func=fileinfo&id=9

Collecting bird feathers at live bird market, Viet Nam



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India

India notified the OIE of an outbreak of H5N1 HPAI on 18 February 2006. Between 27 January 2006 and 18 April 2006, outbreaks were recorded in the Nandurbar and Jalgaon districts of Maharashtra state and the adjacent Surat district of Gujarat state with spill-over into the adjoining part of Madhya Pradesh state. The last outbreak was detected on 18 April 2006 in the Jalgaon district of Maharashtra state.

The control measures adopted in all the outbreaks included:



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Ducks raised in Ca Mau province, Viet Nam

- stamping-out of entire poultry populations (including elimination of potentially infected or contaminated of eggs, feed, litter and other materials around the 10-km area surrounding each outbreak location);
- restrictions on movement of poultry, poultry products and personnel to and from the area of outbreak;
- disinfection and cleaning-up of the infected premises.

Following the last reported outbreak, final cleaning-up and disinfection processes were completed on 7 May 2006. All measures adopted helped in preventing further spread of the disease.

Surveillance for H5N1 (clinical, virological and serological) was carried out in a 15-km radius of the affected area during the period of the first outbreak until August 2006. Surveillance was also continued and carried out over the rest of the country in accordance with Appendix 3.8.9 of the OIE Terrestrial Animal Health Code (2005), but no further evidence of the presence of HPAI was found. A self-declaration was made by the Government of India to the OIE on 11 August 2006 that it had regained its free-country status of notifiable avian influenza.

Results of surveillance and other relevant information on the outbreaks are available on the Department of Animal Husbandry, Dairying and Fisheries, Government of India website at: <http://www.dahd.nic.in>

Republic of Korea

After almost three years without any reports of HPAI occurrence, the possible introduction of a new H5N1 HPAI strain was confirmed on two chicken farms in Iksan city and on a quail farm in Kimje city in the Republic in November/December 2006. All farms had a high level of biosecurity and new buildings and were located along the same highway in a high-density poultry area. Stamping-out measures were applied within 3-km zone and compensation given (100 percent market value of the birds). Movement restriction was enforced with vaccination prohibited.

The role of wild birds in the introduction and spread of HPAI in the Republic of Korea in addition to other sources of infection (such as informal trade of infected poultry products) cannot be ruled out. Poultry production in the Republic of Korea is concentrated in peri-urban areas near Seoul, and in the south-east and central parts of the country.

The Republic was the first country to report H5N1 HPAI in 2003 during the 2003/2004 winter season when infection on 19 poultry premises was confirmed. Migratory birds were indicated as the main potential source of these outbreaks, but confirmatory analysis is lacking. Virus isolation attempts from some migratory wild birds in wintering area in 2004/2005 winter found 26 positive AI strains from 5 460 samples, with only the identification of low pathogenic AI viruses of subtype H1, H3, H4, H7 and H10.



MOHINDER OBEROI

Indian village where poultry were culled



MOHINDER OBEROI

Vehicle disinfection while leaving an affected village in India



MOHINDER OBEROI

Disinfection process in affected village in India



Table 1: Asian countries and regions that have experienced infection of HPAI H5/H5N1 as of 31 December 2006

Country/region	First outbreak	Latest outbreak	Affected populations	Human cases (cases/deaths)
Afghanistan	02/03/06: Jalalabad	04/04/06: Kapissa	domestic poultry, wild birds	no
Cambodia	12/01/04: Pong Peay	24/08/06: Balaing village	domestic poultry, wild birds	6/6
China	20/01/04: Longan, Guangxi	03/10/2006: Henan, Ningxia Hui Autonomous Region	domestic poultry, wild birds	21/14
China (Hong Kong SAR)	19/01/04: Kowloon	25/02/06: Tin Shui Wai	wild birds	no
India	27/02/06: Gujarat	18/04/06: Jalagaon	domestic poultry	no
Indonesia	02/02/04: Banten province	14/09/06: Kamonji	domestic poultry, pigs (without clinical signs)	74/57
Japan	28/12/03: Yamaguchi	05/03/04: Kyoto	domestic poultry, wild birds	no
Kazakhstan	22/07/05: Irtys, Pavlodar region	10/03/06: Cape Peschanyi	domestic poultry, wild birds	no
Korea Rep. of	10/12/03: Asan	22/12/06: Iksan	domestic poultry, wild birds	no
Lao PDR	15/01/04: Ban Nonsavang	14/07/06: Xaythani district	domestic poultry	no
Malaysia	19/08/04: Kelantan state. Tumpat district	21/03/06: Titi Gantung	domestic poultry, wild birds	no
Mongolia	10/08/05: Erhel lake, Alag-Ederne county, Huvsgel province; Khunt lake, Saikhan county, Bulgan province	Early/06/06: Bulgan	wild birds	no
Myanmar	08/03/06: Mandalay	25/04/06: Shwebo district	domestic poultry	no
Pakistan	23/02/06: Abottabad and Charsada	01/07/06: Nelore	domestic poultry	no
Russia (Siberia)	18/07/05: Kupino, Novosibirsk region	31/07/06: Tomsk region	domestic poultry, wild birds	no
Thailand	23/01/04: Banlam subdistrict, Bandplamah	02/08/06: Nakhon and Phanom province	domestic poultry, wild birds, tiger (fed infected/ dead chickens)	25/17
Viet Nam	09/01/04: Long An province and Tien Giang	06/12/06: Vinh Binh and Rach Lum B	domestic poultry	93/42

Note: FAO compiles information from various sources (FAO representatives or country missions, FAO reports, OIE, official government sources, EC, Reference laboratories).

Africa

The first outbreak of HPAI in Africa was detected in Nigeria in February 2006. One month after the declaration, Niger confirmed an outbreak close to its border with Nigeria. Egypt first reported cases officially on 17 February 2006. These involved seven governorates – a situation which indicated that infection had been present for some time before the disease was first diagnosed. Subsequently, the disease was detected in Burkina Faso, Cameroon, Côte d'Ivoire, Djibouti and Sudan. The source of infection of the virus not been identified authoritatively in any of the countries. The disease has remained relatively localized in six of the affected countries, with the spread and impact greatest in Nigeria and Egypt. Despite the constant presence of wild birds in Africa and migration patterns that involve species migrating from infected northern land masses, there is no firm evidence to associate wild birds with the genesis of HPAI outbreaks in Africa.

It is thought that human activities – particularly illegal trade in live birds – are the most likely mode of spread of the disease into and within countries and beyond frontiers. However, the reason why this did not occur before 2005 remains unknown.

As a result, the risk of HPAI spreading across national borders with the legal (or illegal) importation of live birds or poultry products poses a major concern. However, the threat of introduction and spread of HPAI virus by wild birds is a continuing issue that needs to be examined. Recent sequencing of avian influenza virus genomes of Nigerian samples have hypothesized that at least three different introductions of the virus occurred more or less simultaneously. This could be explained by mixed wild bird and commercial origins for HPAI introduction.

In Africa, as in Asia, poultry production and marketing systems involve close contact between humans and birds. This gives rise to a risk of transmission of the virus from birds to humans, with the possibility that changes to the virus could result in human-to-human transmission, the prelude to a human influenza pandemic.

In comparison to the situation in Asia, the disease dynamics in Africa have been noticeably different and are influenced by drastically different environmental, ecological and commercial factors. The disease seems to have died out in some countries such as Cameroon, Djibouti and Niger while others, such as Nigeria or Egypt, have experienced significant difficulties in bringing the disease under control using their control methods. Other countries at risk did not report the disease and have been able to keep the disease out of their national boundaries as of this Bulletin.



FRANÇOIS CHIRON

Training on wild bird identification in Ouahigouya, Burkina Faso



T. TSEGGAI

Ducks raised in a house in Juba, Sudan

HPAI clinical signs in a guinea fowl, Juba, Sudan



T. TSEGGAI



Nigeria: FAO launches country-wide surveillance of avian influenza

In September 2006, FAO launched a country-wide surveillance project after obtaining funding from the European Commission to identify outbreaks of HPAI in Nigeria. The project aims to help eradicate the disease from Africa's most populous country. The principal objective of the project is to obtain current and reliable data on the status of the disease so as to enable the Nigerian authorities to better report to the OIE, and, together with UN technical agencies such as FAO, WHO, UNICEF and the donor community, plan more effective responses to HPAI outbreaks in the country.

During the six-month project, a team of 200 animal

health workers monitored the situation throughout the country, collecting data on the incidence, spread and impact of HPAI. FAO representative in Nigeria Dr Helder Muteia, a veterinarian, commented that, in Africa, "one must be very careful because of the close relationship between birds and humans, especially in the rural areas". H5N1 HPAI was first confirmed in poultry in the north of the country in February 2006 and, despite control measures, the disease continued to spread and as of December 2006 affected 52 local government areas in 19 states and the federal capital territory of the country.

Table 2: African countries and regions that have experienced infection of HPAI H5/H5N1 as of 31 December 2006

Country/region	First outbreak	Latest outbreak	Affected populations	Human cases (cases/deaths)
Burkina Faso	01/03/06: Gampêla	20/05/06: Bobo-Dioulasso, Ouagadougou and Sanguié	domestic poultry, wild birds	no
Cameroon	21/02/06: Maroua (Doualaré area)	28/03/06: Malape	domestic poultry	no
Côte d'Ivoire	31/03/06: Anoumabo	09/11/06: Abatta	domestic poultry, wild birds	no
Djibouti	06/04/06: Boulaos	1 case	domestic poultry	1/0
Egypt	17/02/06: Al Minya, Al Qalyubiyah, Al Qahirah, Al Buthaynah, Al Jizah and Qina governorates	29/12/2006: Al Minufiyah	domestic poultry, wild birds	18/10
Niger	06/02/06: Magaria	01/06/06: Boko Maigao	domestic poultry	no
Nigeria	16/01/06: Igabi, Kaduna state	27/12/06: Plateau state	domestic poultry, wild birds	no
Sudan	20/02/2006: Atbara, Nile river	16/04/2006: Kamleen, Gezira	domestic poultry	no

Note: FAO compiles information from various sources (FAO representatives or country missions, FAO reports, OIE, official government sources, EC, reference laboratories).

Source

FAO. July 2006. ECTAD. Highly Pathogenic Avian Influenza in Africa: A Strategy and Proposed Programme to limit Spread and Build Capacity for Epizootic Disease Control (available at: http://www.fao.org/docs/eims/upload//217651/hpai_strategy_africa_en.pdf)



Europe

H5N1 HPAI has been reported in many countries in the European Region. Since October 2005, outbreaks of HPAI in domestic poultry have been reported in Albania, Denmark, France, Germany, Hungary, Romania, Russian Federation, Serbia, Sweden (H5), Turkey and the Ukraine, with over 230 recorded outbreaks in Romania alone. With the exception of Albania, all these countries also detected the AI H5N1 in *wild birds*. Fourteen of the 26 countries reported AI H5N1 in wild birds only (Austria, Bosnia-Herzegovina, Bulgaria, Croatia, the Czech Republic, Georgia, Greece, Italy, Poland, Slovakia, Slovenia, Spain, Switzerland and the United Kingdom). The AI H5N1 virus was further reported to be found in mammals (cats, dogs, stone marten and mink) and captured wild birds (game birds, zoo birds).

Reoccurrence of the disease was observed in Croatia, Hungary, Romania, the Russian Federation, Turkey and the Ukraine. As of December 2006, no positive cases of HPAI have been reported from Armenia, Macedonia or Moldova, although they all border countries with confirmed cases.

The European Region is crossed by important and overlapping flyways, and has several important wetlands, rivers and shorelines providing sanctuary for many wild, including migratory, birds which can come into direct contact with free-housed backyard poultry held in the vicinity of surface waters. With reports of avian influenza H5N1 virus isolation from several migratory waterfowl in many countries in Asia, Europe and Africa, it is thought that these birds do play a role in virus introduction, although other factors such as legal or illegal trade and movements of birds and poultry contribute significantly to the spread of the disease within and across regions.

Table 3: European countries and regions that have experienced infection of HPAI H5/H5N1 as of 31 December 2006¹

Country/region	First outbreak	Latest outbreak	Affected populations	Human cases (cases/deaths)
Albania	16/02/06: Aliko	09/03/06: Peze-Helmes, Tirane	domestic poultry	no
Austria	10/02/06: Mur river	22/03/06: Schaerding	wild birds, cats	no
Azerbaijan	29/01/06: Qaradag, Baladzharj and Turkan	18/03/06: Banovshalar, Agdam (H5)	wild birds, domestic poultry	8/5
Bosnia-Herzegovina	16/02/06: Plivsko lake	1st case	wild birds	no
Bulgaria	31/01/06: Vidin	09/02/06: Shabla lake and Black sea (H5)	wild birds	no
Croatia	21/10/05: Zdenči, Viroviticko-Podravka county	28/03/06: Zagreb	wild birds	no
Czech Republic	20/03/06: Hluboka nad Vltavou	19/05/06: Kostice	wild birds	no

continued



Table 3 (cont.)

Country/region	First outbreak	Latest outbreak	Affected populations	Human cases (cases/deaths)
Denmark	12/03/06: Svino Strand	26/05/06: Keterminde, Funen (H5)	wild birds domestic poultry	no
France	17/02/06: Joyeux	21/04/06: Villars les Dombes and St Paul de Varax	wild birds, domestic poultry	no
Georgia	23/02/06: Adlia, Khelvachauri district, Adjara	1st case	wild birds	no
Germany	08/02/06: Wiek, Island of Rügen	02/08/06: Dresden	wild birds, domestic poultry, cats, stone marten	no
Greece	30/01/06: Paralia-Katerini, Central Macedonia	04/03/06: Thessaloniki, Central Macedonia	wild birds	no
Hungary	04/02/06: Csatalja and Nagybaracska	09/07/06: Kiskunmajsa and Bodoglár	wild birds, domestic poultry	no
Italy	02/02/06: Marina di Melilli, Puglia	19/02/06: Bruzano, Calabria region	wild birds	no
Poland	02/03/06: Torún	07/05/06: Warta	wild birds	no
Romania	07/10/05: Ceamurlia-de-Jos	31/12/2006: Brasov County	wild birds, domestic poultry, cat	no
Republic of Serbia	28/02/06: Backi Monostor	09/03/06: Bajina Bašta	wild birds, domestic poultry	no
Slovakia	17/02/06: Bratislava	18/02/06: Dunajska Streda	wild birds	no
Slovenia	16/02/06: Podravska	04/03/2006: Maribor	wild birds	no
Spain	30/06/2006: Salburua wetlands, Alava province	1st case	wild bird	no
Sweden	24/02/06: Oskarshamn	26/04/06: Stockholm (H5)	wild birds, game birds, domestic poultry	no
Switzerland	26/02/06: Geneva	30/03/06: Wäldi, Thurgau (H5)	wild birds	no
Turkey	01/10/05: Manyas district, Balikesir province	31/03/06: Bulgurlu Koyu, Akdagmadeni district, Yozgat province	domestic poultry, wild birds	12/4
Ukraine	25/11/2005: Dzhankovskiy, Nizhnegorskiy and Sovetskiy districts in Crimea region	11/06/06: Piski, Sumy region	wild birds, domestic poultry, zoo birds	no
United Kingdom	30/03/06: Anstruther, Scotland	1st case	wild birds	no

Note: FAO compiles information from various sources (FAO representatives or country missions, FAO reports, OIE, official government sources, EC, reference laboratories).

¹ The occurrence of HPAI in Russia (Siberia) is covered on Table 1, page 8.

Near East

Countries and territories under this region include the Middle East cluster with Iraq, Islamic Republic of Iran, Israel, Jordan, Lebanon, Syrian Arab Republic, the West Bank and Gaza Strip, and the Arabian Peninsula cluster with Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, the United Arab Emirates and Yemen. The Near East Region is particularly at high risk because of increased likelihood of the disease spreading the infection among domestic poultry because of the net importation of poultry and poultry products. The region is an important overland route for many migratory bird species.

Starting in mid-February 2006, the H5N1 HPAI strain in domestic poultry was detected in three countries and a territory (Iraq, Israel, Jordan and West Bank and Gaza Strip) with at least two human deaths confirmed in Iraq (May 2006). The first report of HPAI in the Middle East subregion was from northern Iraq (Sulaymanyah) in early February 2006 following the confirmation and spread of the disease in eastern Turkey (October 2005). In northern Iraq, massive culling operations (more than one and a half million chickens and ducks) were carried out in areas close to the village where the human infections had occurred. The disease was also reported in the southern part of the country, although there were no reports of human cases. No outbreaks have been reported since the first quarter of 2006, but because of prevailing insecurity conditions in Iraq and the limited capacity of veterinary services to carry out field surveillance and search for the disease, the country remains at high risk of HPAI incursion without detection.

Outbreaks of HPAI were detected in domestic poultry and ducks in Israel, the West Bank and Gaza Strip and neighbouring Jordan. Outbreaks here were contained and eliminated by applying stamping-out measures in backyard birds and commercial poultry in infected flocks and within the surrounding areas. Culling of infected flock has been carried out in the West Bank and Gaza Strip but this could not be completed because of insufficient logistic and financial resources. While veterinary services in Israel and Jordan are in a position to detect and stamp out any incursion of the disease, the veterinary infrastructure in these territories is insufficient for covering the needs for animal-disease diagnosis and control and for setting up efficient surveillance and reporting systems.

No outbreaks were reported from Syria and Lebanon, but both countries are considered to be at high risk as they share borders with countries of true disease status. Syria has an important poultry sector with a significant proportion of backyard poultry; these need to be under constant surveillance for early detection and response to any disease event. The effectiveness of veterinary services in the Lebanon is hampered by a lack of adequate human and logistical resources for managing animal-health emergencies and for properly responding to HPAI outbreaks.

Apart from a report of H5 virus detected in two quarantined raptors and antibodies detected from a flamingo found dead in a private property, close to the beach in Kuwait in 2005 and five falcons in Saudi Arabia (which had returned from hunting in Senegal in February 2006), the Gulf States and Yemen remain disease free. The nature and scale of poultry-production systems, climatic influences, the relative low number of backyard poultry production and the few live-bird markets in the Gulf States place these countries at an advantage in respect of reduced risk of introduction and ease of HPAI control. Even so, the presence of non-commercial poultry sectors means there is exposure to possible incursion of HPAI viruses as in other countries of the region.



Table 4: Near East countries, territories and regions that have experienced HPAI H5/H5N1 infection as of 31 December 2006

Country/territory/region	First outbreak	Latest outbreak	Affected populations	Human cases (cases/deaths)
Islamic Republic of Iran	02/02/06: Espand and Selkeh	1st outbreak	wild birds	no
Iraq (H5)	18/01/06: Sarkapkan and Dawaw	07/02/06: Sahat Al-aradate	domestic poultry, wild birds	3/2
Israel	16/03/06: En Hashelosh, Ha Darom	30/03/06: Beer-Sheva, Ha Darom	domestic poultry	no
Jordan	23/03/06: Kofranja, Ajloun governorate	1st outbreak	domestic poultry	no
Kuwait	02/11/05	1st (surveillance)	wild bird	no
West Bank and Gaza Strip	21/03/06: Gaza (Middle district)	02/04/06: Gaza (South district – Rafah)	domestic poultry	no

Note: FAO compiles information from various sources (FAO representatives or country missions, FAO reports, OIE, official government sources, EC, reference laboratories).

The Americas

At present, the continent and the Caribbean Region are free of H5N1 HPAI. Even so, following EMPRES principles, the FAO Regional Office for Latin America and the Caribbean concentrates on activities that allow the early detection and prevention of the disease. There is also an emphasis on control and eradication actions that would be taken in the event of an outbreak – these would allow for the recovery and recognition of “free” status as quickly as possible following the guidelines of the Sanitary and Phytosanitary (SPS) agreement of the World Trade Organization (WTO).

Activities were channelled through the implementation of four technical cooperative programmes (TCPs) covering 34 of the 36 countries in the Americas – subregions of the Caribbean (TCP/RLA/3103), Central America (TCP/RLA/3104), Andean Region (TCP/RLA/3105) and the extended MERCOSUR² (TCP/RLA/3106). These include closely coordinate and related activities with Canada and the United States. The region has experience in the detection, diagnosis, control and eradication of HPAI infection in Canada, Chile, Mexico and the USA, although these historical cases are not related to the current H5N1 Asian strain.

Four regional cooperative projects for preventing detecting, and controlling HPAI were launched in August 2006 and will conclude in 18 months. Activities include:

- creation of an epidemiological information system for poultry and wild birds, including geographic information system (GIS) databases;
- documentation on the trade in wild birds;
- design of a surveillance strategy based on risk maps;
- improvements in laboratory diagnostic capability;

² MERCOSUR: Mercado Común del Sur (Argentina, Bolivia, Brazil, Chile, Paraguay and Uruguay).

- possible establishment of an AI regional laboratory for Latin America and the Caribbean;
- updated HPAI national contingency plans;
- simulation exercises;
- training on disease prevention and control;
- development of national compensation strategies;
- development of strategic programmes for social communication and information;
- development of investment project profiles to reinforce poultry diseases surveillance and diagnosis at national and regional levels; and
- identification of potential donors.

Subsequent EMPRES Bulletins will contain reports on the progress of these activities to continue FAO's initial investment.

AI outbreaks have been experienced in Mexico in 1994/1995 (subtype H5N2), Chile (San Antonio Province) in February 2002 (subtype H7N3), Gonzalez county, Texas, United States in February 2004 (subtype H5N2) and British Columbia, Canada in March 2004 (HPAI subtype H7N3).

There are numerous wild bird species on the American continents – all could be potential hosts and transmit the HPAI virus. Every year, for instance, millions of wild waterfowl migrate from the north to the south of the continent and back. Moreover, resident wild birds that migrate within the subregions of the Americas could hypothetically contribute to the spread of HPAI if introduced to the American continent and were identified as reservoirs.

Countries in Latin America and the Caribbean are now supported by official veterinary services and professional technicians in the poultry industry. These professionals are cognisant with AI epidemiology, disease recognition and diagnostic capacities for HPAI, and are trained in poultry- and wild bird epidemiological surveillance. With regard to HPAI caused by subtype H5N1, public health services are also involved in surveillance activities, and are supported by universities and animal and public health research institutes in collaboration with the Pan American Health Organization (PAHO) at the regional level. The results of active and passive epidemiological surveillance activities undertaken by the countries through various institutions during 2006 can be found on Table 5 on page 16.

The countries and international animal health organizations of the Americas regard HPAI (H5N1 Asian strain) as one of the most important transboundary animal diseases. As a consequence, the disease is taken into account within the Global Framework for the Progressive Control of Transboundary Animal Diseases (GF-TADs), and receives complementary regional support for its prevention, detection and control.

As part of activities linked to FAO projects, TCP/RLA/3103, 3104, 3105 and 3106 the following web page has been created exclusively for HPAI: <http://www.rlc.fao.org/prior/segalim/animal/aviar/>

Dr Teodoro Vasquez Rosario holds a gallinule (Gallinula chloropus) for sample collection and morphometrics at Pantanos de Villa Wildlife Reserve in Lima, Peru. This activity was part of a training course prepared by Wildlife Conservation Society for FAO, November 2006



ENRIQUE SAMUDIO

Peruvian ornithologist Samuel Amorós (back, right) explains mist netting techniques to course participants at Pantanos de Villa Wildlife Reserve in Lima, Peru while Dr Omar Benavides Céspedes (centre, right) unfolds the net. This activity was part of a training course prepared by Wildlife Conservation Society for FAO in November 2006



ENRIQUE SAMUDIO



The importance of the poultry industry in the Americas

The continued improvement of the poultry industry in the Americas in recent years has been important for upholding its leadership in chicken meat and egg production in the world, supported by a key producer's organization in the region (Latin American Poultry Association – <http://www.avicolatina.org/>). The poultry industry has modern and competitive worldwide poultry production systems. Nevertheless, in every country there is also a small-scale and backyard poultry production for self-consumption. It is important to underline that throughout the continent chicken meat is the most consumed animal protein source, and plays an important role in improving nutrition, especially for the poorer segments of the population.

Table 5: Avian Influenza situation in the Americas during July 2005–December 2006

Country/region	H5N1 situation
Antigua and Barbuda	No reports of H5N1
Argentina	No reports of H5N1
Bahamas	No reports of H5N1
Barbados	No reports of H5N1
Belize	No reports of H5N1
Bolivarian Republic of Venezuela	No reports of H5N1
Bolivia	No reports of H5N1
Brazil	No reports of H5N1
Canada	12/11/2005: The Canadian government, through the Canadian Agency of Food Inspection and the Wildlife Health Centre of Canada, reported during their active epidemiological surveillance programme that 8 300 birds were tested and further virus identification tests carried out on 3 700 samples. Various subtypes of avian influenza viruses were found, including four of the H5 subtype – H5N9, H5N3, H5N2 and H5N1 – all of which were of low pathogenicity, and thus genetically different from the H5N1 Asian strain. The finding gave rise to the term “low pathogenic North American strain”. (Sources: www.promedmail.org and http://wildlife1.usask.ca/en/aiv/aiv_latest_results.php)
Chile	No reports of H5N1 (last occurrence February 2002 – H7N3)
Colombia	13/10/2005: Ministry of Agriculture and Rural Development reported that during the routine epidemiological surveillance programme being carried out throughout the country, the presence of a low pathogenic AI virus was detected. The virus was characterized as H9N2 and affected three farms in the department of Tolima, located in the northeast of the country. As a preventive measure, the ministry established farm quarantine and testing of susceptible poultry. (Source: www.minagricultura.gov.co)
Costa Rica	No reports of H5N1
Cuba	No reports of H5N1



Table 5 (cont.)

Dominica	No reports of HPAI
Ecuador	No reports of HPAI
El Salvador	No reports of HPAI
Grenada	No reports of HPAI
Guatemala	No reports of HPAI
Guyana	No reports of HPAI
Haiti	No reports of HPAI
Honduras	No reports of HPAI
Jamaica	No reports of HPAI
Mexico	11/01/2006: The Mexican authorities reported a low pathogenic case of AI (H5N2) in the state of Chiapas, near the border with Guatemala. H5N2 is known to circulate in Mexico. (Sources: www.agrodigital.com and http://senasicaw.senasica.sagarpa.gob.mx/portal/html/salud_animal/vigilancia_epidemiologica/Situacion_Zoosanitaria_en_los_estados_de_la_Republica_Mexicana.html)
Nicaragua	No reports of HPAI
Panama	No reports of HPAI
Paraguay	No reports of HPAI
Peru	No reports of HPAI
Dominican Republic	No reports of HPAI
Saint Christopher and Nevis	No reports of HPAI
Saint Vincent and Grenadines	No reports of HPAI
Saint Lucia	No reports of HPAI
Suriname	No reports of HPAI
Trinidad and Tobago	No reports of HPAI
United States	5/09/2006: Various cases of the H5N1 isolated, although the strain in question was the low pathogenic North American strain which is genetically different from the highly pathogenic Asian strain. These isolated cases were obtained in the course of the government's active surveillance activities in otherwise healthy wild birds. The virus was detected in the faeces of swans in Michigan and of wild ducks in Pennsylvania. 7/10/2006: The low pathogenic H5N3 avian influenza virus was isolated in 2 of the 16 samples collected from wild pintails in Casacade county, Montana. (Source: www.usda.gov)
Uruguay	No reports of HPAI

For further information:Latin American Poultry Association: <http://www.avicolatina.org>



Assistance from veterinary diagnostic laboratories

FAO is grateful to the following veterinary diagnostic laboratories for assisting in the diagnosis and characterization of isolates from samples submitted from third-world countries:

- 1 Veterinary Laboratories Agency (VLA), Weybridge, UK.
 - 2 National Veterinary Services Laboratories (NVSL), US Department of Agriculture (USDA), Ames Iowa, USA.
 - 3 Istituto Zooprofilattico Sperimentale delle Venezie (IZSV), Padova, Italy.
 - 4 Kimron Veterinary Institute (KVI), Bet Dagan, Israel.
 - 5 Centre de cooperation internationale en recherche agronomique pour le développement (CIRAD), Montpellier, France.
 - 6 Onderstepoort Veterinary Institute (OVI), Onderstepoort, South Africa.
 - 7 Australian Animal Health Laboratory (AAHL), Commonwealth Scientific and Industrial Research Institute (CSIRO), Geelong, Australia.
 - 8 University of Hokkaido, Japan.
 - 9 University of Kasetsart, Bangkok, Thailand.
 - 10 Federal Centre for Animal Health (FGI ARRIAH), Vladimir, Russia.
 - 11 Central State Laboratory of Veterinary Medicine, Kyev, Ukraine.
 - 12 Laboratoire national d'appui au développement agricole (LANADA), Bingerville, Côte d'Ivoire.
 - 13 Harbin Veterinary Research Institute, Harbin, People's Republic of China.
- And
- 14 Centers for Disease Control and Prevention, Atlanta, USA.
 - 15 Naval Medical Research Unit 3, US Navy, Cairo, Egypt.



Emergency Centre for Transboundary Animal Diseases (ECTAD)

Since HPAI was first reported in Viet Nam in December 2003, FAO, together with the World Organisation for Animal Health (OIE), has taken a lead role in coordinating the international response to the spread of the disease in animals. Through its Emergency Centre for Transboundary Animal Diseases (ECTAD), FAO has been supporting surveillance and disease-control efforts in infected countries and has assisted non-infected countries in reducing the likelihood of disease introduction and in preparing a rapid and effective response if the disease is detected.

At the onset of the HPAI crisis in Asia, FAO initially allocated US\$5.5 million of its own funds to assist in efforts to combat the disease through the implementation of 14 emergency projects. To date FAO has deployed approximately US\$10 million of its resources in support of the global effort against HPAI.

ECTAD, which brings together technical and operational expertise into one co-ordination unit, utilizes platforms within its structure for an effective HPAI global response. ECTAD includes all of the EMPRES staff, including the responsible officers of personnel of the Global Early Warning System (GLEWS) and key staff of the Animal Production Service and Policy Branch of FAO's Animal Production and Health Division (AGA), technical cooperation department (TCE), the OFFLU network, communications personnel, global wildlife surveillance programmes and the Crisis Management Centre (CMC). ECTAD is coordinated technically by the Chief Veterinary Officer of FAO (Joseph Domenech) and seconded by the Senior Officer of EMPRES (Juan Lubroth). FAO has emphasized to donors the nature of the threat posed by HPAI and the importance of preventing a possible human pandemic by combating the disease in its avian hosts.

While it is very important to provide immediate assistance to countries that have outbreaks of HPAI and continue to support countries where the disease is endemic, it is also imperative to prepare countries that may be at risk of becoming infected by the disease. Working in concert with and building on these specific country activities, the regional coordination led by ECTAD and encouraged initially by the OIE/FAO regional animal health centres (Bamako, Bangkok, Beirut, Gaborone, Nairobi and Tunis) is at the heart of the overall FAO global programme with the aim of providing a successful international HPAI response, and, in the longer term, for immediate and efficient response to any transboundary animal disease, including zoonotic diseases.



Crisis Management Centre (CMC)

FAO has placed protection of livestock and livelihoods high on its agenda for the future with the launch on 12 October 2006 of its Crisis Management Centre (CMC) in association with the World Organisation for Animal Health (OIE). This is a rapid-response facility that is designed to boost and expand FAO's already existing capacity to handle transboundary animal diseases (TADs), such as HPAI.

Officially inaugurated by FAO Director-General Jacques Diouf in the presence of OIE Director General Bernard Vallat, the new centre is equipped with the latest communications technology and a core staff of scientists and emergency experts on stand-by to move into action immediately an animal disease or other threat to the world's food chain is reported.

The CMC is the world's frontline facility for responding immediately to high-risk events or the occurrence of TADs or pests. It works in close cooperation with the appropriate ministries of the countries concerned and other international or regional organizations. In its initial stages, the CMC will concentrate on the global HPAI emergency, working with the OIE to eradicate outbreaks of the disease that would otherwise run the risk of spreading out of control. In the fight against avian influenza, the centre will increase the quick-reaction capacity of the already existing Emergency Centre for Transboundary Animal Diseases (ECTAD), headed by FAO's Chief Veterinary Officer.

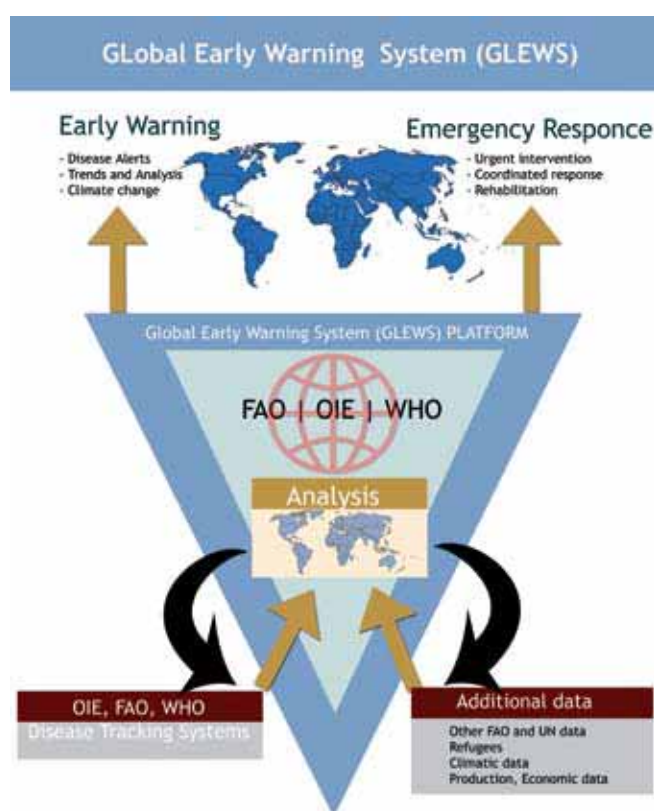
ECTAD will continue to act as FAO's component of the global UN strategy to prevent and control H5N1 HPAI. In addition, the centre will draw on the expertise of the joint FAO/OIE/WHO early warning facility – the Global Early Warning System (GLEWS) – to obtain the critical advance data necessary to identify hotspots and draw up plans and strategies to halt H5N1 HPAI at its animal source.

Global Early Warning System (GLEWS)

The Global Early Warning System (GLEWS) is the first joint FAO, OIE and WHO initiative designed to help forecast disease, undertake disease analysis and understand trends to better develop strategies in prevention and response to transboundary animal diseases (TADs), including zoonoses, worldwide. First conceived in 2000, GLEWS is built on the added value of combining and coordinating the tracking, verification, alert and response mechanisms of OIE, FAO and WHO for the international community and stakeholders to assist in the prevention and control of TAD threats.

GLEWS is a joint initiative to facilitate the timely exchange of official and unofficial information on suspected or confirmed transboundary animal disease events among the three organizations. In July 2006, GLEWS was formally launched in Geneva and an agreement signed by the three organizations. Major investments are foreseen in order to build a GLEWS information system integrating the existing information systems of OIE, FAO and WHO and other specialized institutions.

Figure 3: Global Early Warning System (GLEWS)





Control at an early stage

Early and accurate warning of new TAD outbreaks and the capacity to forecast their spread to new areas are prerequisites for effective prevention, containment and control. Recent experience demonstrates that, throughout much of the world, weaknesses in disease surveillance systems, an inability to control major diseases at source, and the globalization of trade have been responsible for the spread of such diseases as HPAI, foot-and-mouth disease (FMD), bovine spongiform encephalopathy (BSE) and classical swine fever (CSF), some with public health implications.

Early warning and early reaction lie at the heart of effective prevention and progressive control of TADs. The basic concept is that it is easier and more economical to deal with a disease epidemic in its early stages than when it has become widespread. Today, the spread of HPAI reinforces the fact that the animal and human health sectors must work closely together, and that early detection and coordination are critical. This new network is an essential step forward of global importance.

Improved forecasting and prevention

The main expected outputs of GLEWS are better forecasting and prevention of animal disease threats, through sharing of information, epidemiological analysis and joint field missions to assess and control outbreaks in animals and humans.

The epidemiological information that is processed in the GLEWS system will be enhanced by in-depth analysis, including the integration of additional factors that might have an impact on the occurrence and spread of major diseases (e.g. land use, economic factors, civil unrest, climatic changes, etc.). The information gathered through the tracking and verification channels of each organization will be shared using the GLEWS web-based electronic platform, and analysed to decide whether to issue common early warning messages. These alert messages will describe the possible implications of disease spread among animals at national, regional and international level and its potential public health impact. If there is a clear indication that a joint on-site assessment or intervention are required, the response mechanisms of the three organizations will be activated in a collaborative fashion.

For more information see: http://www.fao.org/docs/eims/upload/217837/agre_glews_en.pdf



OFFLU: Joint OIE/FAO worldwide scientific network for avian influenza

In April 2005, the OIE and the FAO launched a new joint scientific expert network to support the international community on avian influenza matters (OFFLU).

OFFLU objectives

The objectives of OFFLU are to:

- 1 Exchange scientific data and biological materials (including virus strains) within the network, and to share such information with the wider scientific community.
- 2 Offer technical advice and veterinary expertise to member countries to assist in the diagnosis, surveillance and control of avian influenza.
- 3 Collaborate with the WHO influenza network on issues relating to the animal–human interface.
- 4 Highlight avian influenza research needs, promote their development and ensure coordination.

OFFLU keeping pace on global sharing of virus samples

OFFLU will systematically make avian influenza virus sequences accessible to the entire scientific community. With this gesture OFFLU reiterates its call to world scientists, international organizations and countries for a global sharing of virus strains and genetic sequences.

OFFLU has been working on promoting the key objectives “to exchange scientific data and biological materials (including virus strains) within the network, and to share such information with the wider scientific community”. Under this new impetus, strains will be sent to the National Institute for Health for sequencing and deposited in full transparency on the free-access database, GenBank.

On 14 March 2006, the Scientific Committee of OFFLU, made up of leading world experts on avian influenza, revised its terms of reference to place a new emphasis on the need for further collection, characterization and exchange of avian influenza viruses, and for the expansion of the genomic database for animal influenza viruses.

Sharing virus strains, samples and sequences is a critical part of the global work on the surveillance and control of the H5N1 HPAI virus, and supports the preparation of human vaccines. Avian influenza brings long-term implications for human health and therefore OFFLU works closely with the World Health Organization Working Group on Influenza Research at the human–animal interface.

Virus strains are considered as intellectual property by some countries or scientists, and sharing them can be seen as potentially hampering an individual's recognition in research initiatives or scientific publications. However, OFFLU made significant progress on 16 February 2006 when Ilaria Capua of the Istituto Zooprofilattico Sperimentale delle Venezie (Italy) and OFFLU Secretary, released sequence data of the H5N1 virus found in Nigeria and Italy on GenBank. In the meantime,



she urged her colleagues around the world to share their information on isolated H5N1 virus strains.

Scientists of the OIE/FAO network repeated their conviction in a letter published by *Science* journal a few weeks later: "We will make available for genome nucleotide sequencing of H5N1 contemporary isolates from several countries and relevant historical strains," said Ilaria Capua and fellow Ian Brown (VLA-Weybridge, UK),³ Michael Johnson (AAHL, Australia),⁴ Dennis Senne (NVSL, USA)⁵ and David Swayne (SEPR, USA).⁶

The stance taken by the Group of Eight (G8) leaders during their 2006 meeting in Russia on global sharing of virus samples further strengthens this initiative. In its statement on the fight against infectious diseases, the G8 concluded that it was:

... determined to achieve tangible progress in improved international cooperation on the surveillance and monitoring of infectious diseases, including better coordination between the animal and human health communities, building laboratory capacities, and full transparency by all nations in sharing, on a timely basis, virus samples in accordance with national and international regulations and conventions, and other relevant information about the outbreaks of diseases.

Through an active and permanent scientific cooperation, the OFFLU network will develop and harmonize synergistic research projects in different parts of the world. Sharing permanently updated scientific information and expertise on efficient control methods of the animal disease will provide a pro-active approach in helping infected countries to eradicate the disease and free countries to protect themselves.

Reference

Edwards, S. 2006. OFFLU network on avian influenza. *Emerging Infectious Diseases*, 12(8): 1287–8.

For more information, see OFFLU website: www.offlu.net

³ VLA-Weybridge: Veterinary Laboratory Agency, Weybridge.

⁴ AAHL: Australian Animal Health Laboratory.

⁵ NSVL: National Veterinary Services Laboratories.

⁶ SEPR: Southeastern Poultry Research Laboratory.



Joint FAO/IAEA programme helps members in their fight against HPAI

The International Atomic Energy Agency (IAEA) and FAO have addressed the question of the timely response needed by members to combat H5N1 HPAI, through the Joint FAO/IAEA Programme. An interregional training course on the "Rapid diagnosis of avian influenza" was held from 20 November–1 December 2006 at the Molecular Techniques and ELISA⁷ OIE Collaborating Centre, Seibersdorf, Austria. The training course was part of action undertaken by the IAEA and FAO to improve the capacity of members to control and eradicate transboundary animal diseases, particularly those of high economic and zoonotic importance.

Operated by the Joint FAO/IAEA Division, the training course was attended by some 30 senior laboratory technicians from Africa, Asia and Latin America. Its aim was to harmonize diagnostic protocols and procedures and to enhance the technicians' knowledge and proficiency in the use of molecular techniques for the rapid, sensitive and confirmatory diagnosis of avian influenza.

Since the beginning of the current avian influenza epidemic in 2003, the IAEA has provided members with technical advice and support in diagnostics for controlling highly pathogenic avian influenza. This has included providing information about the best "fitness for purpose" tools, quality assured standard operation procedures (SOPs) and appropriate vaccines to use in close collaboration and consultation with experts in the field.

In May 2005, the IAEA convened an expert consultation meeting on "Early warning devices and tools to diagnose known and unknown emerging diseases" in Vienna, Austria. The purpose of the meeting was to evaluate progress and make recommendations about the direction the development of tools used for the early, rapid and confirmatory detection of transboundary animal diseases, with a particular focus on avian influenza, should take in the future. In addition, the Joint FAO/IAEA Programme launched a targeted coordinated research project (CRP) in September 2006 to help members protect their poultry markets from avian influenza. The CRP's objective is to develop sensitive, specific and rapid early-detection technologies, including remote, penside or hand-held systems, to detect and or confirm harmful pathogens present in:

- 1 animals before the onset of disease or signs of the disease;
- 2 animals in the "disease-carrier" status; or
- 3 very low numbers in animals or populations of animals.

Training course on avian influenza diagnosis at FAO/IAEA, Vienna, Austria



MAMADOU LELENTA

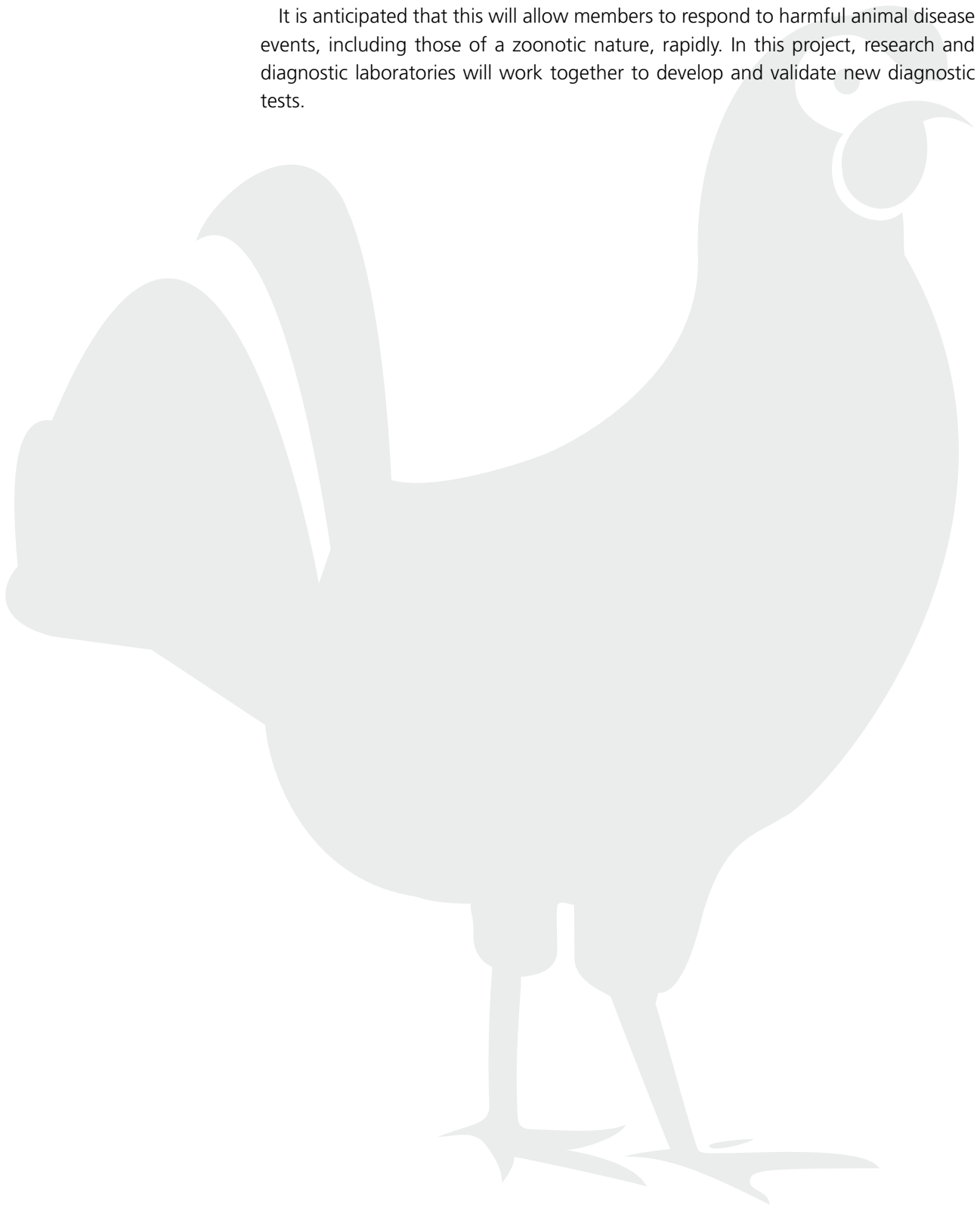


MAMADOU LELENTA

⁷ Enzyme Linked Immunosorbent Assay.



It is anticipated that this will allow members to respond to harmful animal disease events, including those of a zoonotic nature, rapidly. In this project, research and diagnostic laboratories will work together to develop and validate new diagnostic tests.



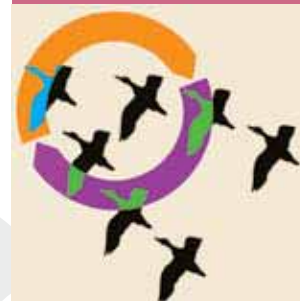
FAO/OIE International Scientific Conference on Avian Influenza and Wild Birds

The FAO/OIE International Scientific Conference on Avian Influenza and Wild Birds was held on 30–31 May 2006, at FAO Headquarters, Rome. During the two-day conference, more than 300 veterinarians, virologists and conservationists from around the world discussed issues such as migratory bird flyways, poultry-farming systems and global trade in terms of avian influenza virus ecology, virus introduction and disease spread. They concluded that the answer to the cycle of avian influenza outbreaks lies in a combination of all three. They also agreed that it is crucial to know whether wild birds can act as permanent reservoirs of H5N1 HPAI.

It was argued that only a concerted global effort to monitor the situation will throw light on many of the uncertainties surrounding the reasons for the appearance of the disease in some locations and not in others. It was further recognized that wild birds play a role (albeit unclear) and therefore must share some of the responsibility for the current concern surrounding outbreaks of the deadly H5N1 strain of HPAI. Participants were united in their conviction that the key to controlling the disease lies above all at the level of poultry.

In order to learn more about the issues behind the debate and the positions adopted by experts from many different fields, the conference website (www.fao.org/ag/AI-Conference) offers a rich collection of abstracts and presentations from the conference as well as the full recommendations.

Key recommendations from the FAO/OIE International Scientific Conference clearly state that “destruction of wild bird habitats or indiscriminate culling of wildlife is scientifically unjustified as a method to prevent disease transmission, as a response to an H5N1 HPAI outbreak, or as a control strategy”. These recommendations are also in concurrence with Resolution 3.18 of the African Eurasian



Logo of the Conference on AI and Wild Birds



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Joseph Domenech, Chief Veterinary Officer, FAO, speaking during a press conference held in connection with the two-day FAO and OIE International Scientific Conference on Avian Influenza and Wild Birds. FAO Headquarters, Rome, Italy

Controlling HPAI at poultry level

The FAO/OIE International Scientific Conference on Avian Influenza and Wild Birds, held in Rome in May 2006, concluded that both wild and domestic birds appear to be involved in the spread and persistence of H5N1, although it has been acknowledged that control of the disease should be affected at the level of poultry.



General view of delegates during the International Scientific Conference on Avian Influenza and Wild Birds, FAO Headquarters, Rome, Italy

Waterbird Agreement (UNEP⁸/AEWA), Resolution 8.27 of the UNEP Convention on the Conservation of Migratory Species (UNEP/CMS) and Resolution 9.23 of the Ramsar Convention on Wetlands, which have been endorsed by 119 countries from Europe, Asia, the Americas, Near East and Africa.

Furthermore, despite wild birds being blamed for many poultry outbreaks that have occurred since 2004, not a single poultry outbreak has been definitively linked to the disease being introduced via wildlife.

Wildlife-disease ecology studies

FAO has supported multiple wild bird disease ecology studies (an initial project began in July 2005 in Mongolia). In each project, FAO works with multiple partners (usually at least five) and to date, the United States Geological Survey (USGS) (WERC⁹ and AK Science Center¹⁰) has been one of FAO's most consistent partners. In total, FAO has deployed approximately 100 satellite transmitters since July 2006 in China (Poyang lake and Qinghai lake), Mali, Malawi, Mongolia and Nigeria on 14 species of migratory waterfowl. FAO has plans to start new projects in the Black Sea Basin, India and Siberia. Wild bird movement patterns can be seen for FAO collaborative projects at the following websites: http://www.fao.org/avianflu/en/sat_telemetry.html <http://wildbirds-ai.cirad.fr/birds-history.php> <http://www.werc.usgs.gov/sattrack/index.html>

As the global community continues to demand better information on wild bird movements and habitat use, and as FAO tries to gain better insight into the transmission patterns, spread, and drivers of disease emergence, these projects are becoming more important and valuable.

⁸ UNEP = United Nations Environment Programme.

⁹ WERC = Western Ecological Research Center.

¹⁰ AK Science Center = Alaska Science Center.



FAO in action in the field ...

FAO's response in Africa, Eastern Europe, the Near East, Latin America and the Caribbean

Following widespread H5N1 HPAI outbreaks in Asia, FAO has developed and implemented regional Technical Cooperation Programme (TCP) projects in Africa, Eastern Europe, Near East, Latin America and the Caribbean. These TCPs were developed to assist the countries at risk at that time (some have since reported infections of HPAI) in disease preparation, training for disease surveillance and in establishing subregional epidemiology and laboratory networks in order to build the countries' internal, as well as regional, capacity for HPAI detection and response.

In the context of FAO's global programme for AI control and eradication, ECTAD has provided immediate assistance through the Special Fund for Emergency and Rehabilitation Activities (SFERA) to countries and territories. A series of emergency kits was procured for countries to assist in disease surveillance and outbreak containment. This emergency assistance includes personal protective equipment, sample shipping boxes, necropsy kits, vaccine carriers (coolers), disinfectants, sprayers and avian influenza diagnostic reagents. Furthermore, support was also provided for addressing urgent training needs in disease surveillance and reporting, laboratory diagnostics, biosecurity practices and public awareness.

Additionally, in an ongoing effort to assist countries in their efforts to prevent and control HPAI, FAO has developed country-specific projects for interim emergency assistance in many at-risk countries to strengthen veterinary services and build human and infrastructure capacity to respond appropriately to HPAI outbreaks. These projects are being implemented within the framework of regional action plans that are consistent with the FAO/OIE Global Strategy for the Progressive Control of HPAI.

At the regional level, activities were also initiated to promote regional coordination and networking, support socio-economic and farming system studies, develop compensation strategies with country stakeholders, and conduct epidemiology and wild bird studies.

Technical Cooperation Programme (TCP) project "Emergency assistance for early detection and prevention of avian influenza"

Because of the possible spread of HPAI through trade and along migratory bird flyways to the Near East and Africa, TCP projects were launched to strengthen the capacity for generating and sharing HPAI disease information and for using this to mount emergency preparedness planning against the eventuality of HPAI being introduced into the region, or beyond.

Nine TCP projects on emergency preparedness and early detection of HPAI were approved for eastern and southern Africa, western and central Africa, northern Africa, Near East, central Europe and Caucasus and Latin America and the Caribbean (see Table 6 below). These TCP projects were launched in late 2005 and early 2006



SHABANI

Participants in the Laboratory Workshop on Avian Influenza held in April 2006 in Tehran, Islamic Republic of Iran

for 18 months as part of several FAO initiatives for dealing with transboundary animal diseases. Launching workshops to set up regional networks for disease prevention and surveillance were held in December 2005 (Budapest, Hungary), in January–February 2006 (Nairobi, Kenya, Bamako, Mali and Cairo, Egypt) and in August–September 2006 for the Americas.

The immediate objectives of the projects were to strengthen the capacity for generating and sharing HPAI disease information and use this to mount emergency preparedness planning against the eventuality of HPAI being introduced into the region, specifically in relation to migration of wild birds and trade. Specifically,

the aims were to:

- 1 Generate an understanding of migratory bird movement into and within the region and the potential for their contact with domestic poultry (see page 34 report on Wildlife, Avian Influenza and HPAI).
- 2 Build public awareness of the issues relating to the risks.
- 3 Strengthen HPAI field surveillance and laboratory support for diagnosis.
- 4 Establish information and technology network linkages with other regions (e.g. FAO/OIE/WHO Global Early Warning System [GLEWS] and OIE/FAO Network of Expertise on Avian Influenza [OFFLU]) in the global system for HPAI surveillance.

Table 6: FAO emergency TCP projects for the early detection, prevention, and control of HPAI

Region	Projects	Countries
Andean Region	TCP/RLA/3105 (E)	Bolivarian Republic of Venezuela, Colombia, Ecuador and Peru.
East and Southern Africa	TCP/RAF/3017 (E)	Botswana, Ethiopia, Kenya, Malawi, Swaziland, Madagascar, Mozambique, Sudan, Tanzania, Uganda, Zambia and Zimbabwe.
Eastern Europe and the Caucasus	TCP/RER/3004 (E)	Armenia, Azerbaijan, Bulgaria, Croatia, Georgia, Hungary, the Republic of Moldova, Romania, Republic of Serbia, The former Yugoslav Republic of Macedonia, Turkey and Ukraine.
Latin America and the Caribbean	TCP/RLA/3103 (E)	Antigua and Barbuda, Bahamas, Barbados, Cuba, Dominica, Dominican Republic, Grenada, Guyana, Haiti, Jamaica, Saint Kitts and Nevis, Saint Vincent and the Grenadines, Saint Lucia, Suriname and Trinidad and Tobago.
Middle America	TCP/RLA/3104 (E)	Belize, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua and Panama.
Near East	TCP/RAB/3005 (E)	Iraq, Islamic Republic of Iran, Jordan, Lebanon, Syria and Yemen.
North Africa	TCP/RAB/3006 (E)	Algeria, Egypt, Libyan Arab Jamahiriya, Mauritania, Morocco and Tunisia.
Southern Cone	TCP/RLA/3106 (E)	Argentina, Bolivia, Brazil, Chile, Paraguay and Uruguay.
West and central Africa	TCP/RAF/3016 (E)	Benin, Burkina Faso, Cameroon, Côte d'Ivoire, Gambia, Ghana, Guinea, Guinea-Bissau, Mali, Niger, Senegal, Chad and Togo.



Summary of common needs established during the workshops held in the eastern Europe and Caucasus, eastern and southern Africa, western and central Africa

Wild bird surveillance

Surveillance in wild birds is important for the regions.

- Set up risk-based surveillance and field research into the role of these birds in introduction, maintenance, and transmission of the virus.
- Establish priority zones of high-risk areas for targeted surveillance of wild birds' migratory patterns and define their potential role in the epidemiology of AI.
- Link wild bird and wetlands surveillance to national epidemiological surveillance systems and carry out research surveys that evaluate and map interaction between wild birds and domestic poultry.
- Define the extent of illegal trade in wild birds, its role in HPAI virus transmission and lobby the relevant authorities for controlling illegal wild bird trade.

Emergency preparedness

Emergency preparedness plans should be evaluated and harmonized between countries in the regions.

Epidemiological surveillance and training

Surveillance capabilities for avian influenza must be enhanced with support from international organizations. The FAO guidelines provide a useful framework for countries to use in designing national and regional surveillance programmes.

- Advanced training in outbreak investigation methodologies, data analysis, and surveillance network design is needed.
- Risk-analysis training should incorporate aspects of risk-based (targeted) surveillance, risk communication and risk management, all of which will be specifically developed for the countries and regional networks.
- Advanced training of epidemiologists and other representatives of the veterinary services is required (surveillance protocol design, risk assessment, geographic information system [GIS] and statistical methods [such as sampling frames and design, data analysis and interpretation]).

Laboratory support and training

FAO should ensure provision of reference materials as well as laboratory equipment and enhance laboratory training.

- OIE/FAO reference laboratories should be supported to increase the production and supply of reference reagents.
- Additional laboratories in the region need to be identified for production and regional distribution of secondary diagnostic reagents of equal reactivity as reference standards.



T. TSEGGAI

Investigation team preparing to inspect suspect cases of HPAI in Juba, Sudan



ARNAUD LE MENACH

Practical training in epidemiology of avian influenza in Ouagadougou, Burkina Faso



ISMAIL LOKBANI

Laboratory training in AI diagnosis in Rabat, Morocco

- Training of laboratory staff should focus on virus isolation, virus typing, molecular detection techniques (especially of AI subtypes H5 and H7), serological assays, and quality assurance/quality control aspects in a veterinary diagnostic laboratory (i.e. ISO 17025).

At the eastern Africa workshop, capacity building in differentiating between avian influenza and Newcastle disease was also emphasized.

Information and technology network

Countries need to recognize the importance of information sharing, including unofficial information through the regional networks.

- Promote a regional network for collection, compilation and dissemination of the data in order to share epidemiological data and other information relevant to HPAI situation. Implement an electronic network system.
- Establish a laboratory network to increase sharing of information and exchange of material between the national reference laboratories of the region and OIE/FAO Reference Laboratories. Create a website with restricted access for participants. This could be set up by the FAO subregional office. Such regional sites could be linked to the OFFLU website (www.offlu.net). Make procedures (permits, documents, list of contacts) for material dispatch (reagents, samples, live viruses) available.

Socio-economic impact

FAO also intends to help limiting the socio-economic impacts associated with HPAI outbreaks or indirect market shocks. Establishing national and regional compensation policies so as to make funds readily available in the case of HPAI outbreaks in the African Region is therefore essential.

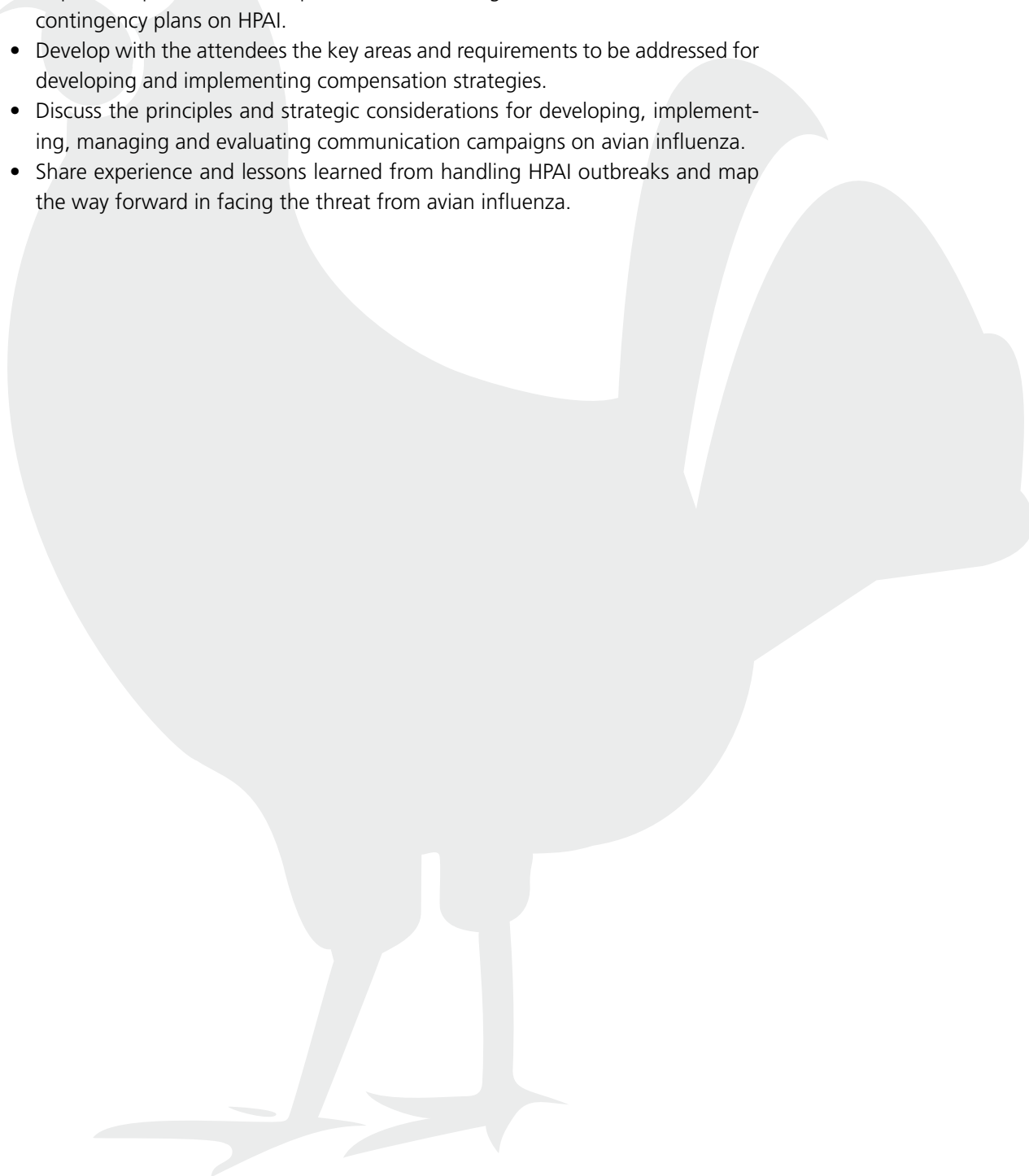
Workshops on avian influenza: contingency planning, compensation and communication

Aware of the importance of contingency planning to manage animal health emergencies, veterinary authorities in many countries have requested FAO's assistance to review their preparedness plans and assist them in developing concrete strategies for compensation of stock losses in the event of an outbreak of highly pathogenic avian influenza. Workshops were organized in 2006 in response to these requests and to act as a first step in developing the capacity required to respond rapidly to avian influenza emergency situations and to manage the threat from the disease properly. The workshops were held in the Near East and north Africa in order to discuss the basic requirements and the strategic considerations for developing and implementing contingency plans, developing compensation programmes, and improving avian influenza communication.

The aims of the workshops were to:



- Provide attendees with the tools for contingency planning for avian influenza, based on a practical and methodological approach to identifying critical issues for developing, reviewing and implementing these plans.
- Capture requirements and options for conducting simulation exercises to test contingency plans on HPAI.
- Develop with the attendees the key areas and requirements to be addressed for developing and implementing compensation strategies.
- Discuss the principles and strategic considerations for developing, implementing, managing and evaluating communication campaigns on avian influenza.
- Share experience and lessons learned from handling HPAI outbreaks and map the way forward in facing the threat from avian influenza.





Whooper swans on a lake in eastern Mongolia



J. TAKEKAWA

Wildlife, avian influenza and HPAI

Introduction

In line with the FAO/OIE Global Strategy for the Progressive Control of HPAI, and evidence that wild birds might play a role in the spread of H5N1 HPAI virus along with poor biosecurity at poultry farms, FAO and particularly the EMPRES/Emergency Centre for Transboundary Animal Diseases (ECTAD), has developed a wildlife disease programme. The programme aims to facilitate partnerships, coordinate activities, and enhance training opportunities. A further objective of the programme is to support science that leads to greater understanding about multiple aspects of H5N1 viral ecology, including studies on:

- wild bird AI virus carriers, shedders, and transporters;
- epidemiological studies that evaluate linkages between agriculture and wildlife as possible modes of disease transmission and spread;
- wildlife ecology studies that look at key wildlife species, their migratory patterns, habitat use, and the timing of migration as it relates to H5N1 HPAI outbreaks in poultry and wildlife;
- risk analysis, including GIS mapping of historical and expected outbreaks using available FAO-OIE data; and
- remote sensing as a tool to better understand how environmental conditions may play a role in the introduction or emergence of this disease.

FAO is uniquely situated to be able to help increase the understanding of the role of wildlife in the emergence, introduction and/or spread of H5N1 HPAI virus and other pathogens as well as in coordinating many aspects of disease prevention, control, and impact minimization through collaborations with OIE, WHO, national governments, ministries, chief veterinary officers, wildlife veterinarians, epidemiologists, virologists, biologists, ecologists, and ornithologists. FAO, and specifically the Emergency Prevention System (EMPRES) for Transboundary Animal and Plant Pests and Diseases, recognize that to prevent, control, and minimize the effects of H5N1 HPAI virus, and other agricultural transboundary diseases, the interface between the agriculture and wildlife sectors must be addressed properly.

To these ends, FAO has made significant gains in facilitating and leading activities aimed at understanding the role of wild birds and the spread of H5N1 HPAI virus, including but not limited to:

- Hosting the FAO/OIE International Scientific Conference on Avian Influenza and Wild Birds, Rome, 30–31 May 2006 and publishing proceedings in a peer-reviewed journal, including official recommendations from the FAO-OIE International Scientific Conference.
- Coordinating and facilitating training of over 100 in-country nationals from over 80 countries on wildlife issues.



N. BATBAYAR

Marking whooper swans with GPS transmitters



B. CHUN

Release of a whooper swan marked with a GPS transmitter

- Writing and publishing the *Wild Bird AI Surveillance – A Manual for Sample Collection from Healthy, Sick and Dead Birds*.
- Coordinating and facilitating wildlife surveillance in 17 countries.
- Helping build and participate in an avian disease global data-sharing network, which includes information from EMPRES, Global Early Warning System (GLEWS), the Global Avian Influenza Network for Surveillance (GAINS), and other partner programmes.
- Participation in the United Nations Environment Programme (UNEP) Scientific Task Force on Avian Influenza.
- Collaborating with many scientists and researchers on understanding the epidemiology and ecology of H5N1 HPAI including, but not limited to, CIRAD,¹¹ University of New Hampshire, US Geological Survey (USGS), Royal Veterinary College, Wetlands International, Wildfowl & Wetlands Trust, Wildlife Conservation Society (WCS), and others.
- Developing field projects that examine carefully, through the use of satellite telemetry and remote sensing information, migratory patterns of key wildlife species thought to potentially play a role in the spread of H5N1 HPAI virus.

Lessons learned: wildlife and H5N1 HPAI virus

- Over 80 species from 14 Order of birds have been found to be positive for H5N1 virus which is highly pathogenic in chickens. Yet virtually all positive samples have been from moribund, sick or dead wild birds.
- Dead wild birds fall into three general categories: (i) migratory waterfowl species; (ii) bridge species (some non-migratory) who may play a role in transmitting disease from poultry to wildlife or visa versa; and (iii) predatory birds that most likely acquired the disease from scavenging dead birds (poultry or wild birds) or by depredating sick birds.
- Approximately 200 000 samples from healthy wild birds sampled in Europe, Asia, Africa, and in the Americas during 2005–2006 have been negative for the H5N1 AI virus.
- Only one study has reported healthy wild birds to be positive for H5N1 HPAI: consisting of six ducks (species not provided) sampled in China from an area also used to raise ducks agriculturally.
- Not found are the species of wild birds that may serve as the reservoir for AI H5N1 virus (i.e. healthy and shedding virus over a long duration).
- Surveillance conducted on wildlife (via cloacal swabs) thus far may have missed the disease as it is now know that respiratory excretions (tracheal swabs) should also be collected, in addition to cloacal swabs.
- There is no clear understanding of the role that wildlife play in the spread of disease, but it is recognized that wild birds have flown hundreds of kilometres

¹¹ Centre de coopération Internationale en recherche agronomique pour le développement.



probably carrying the H5N1 virus, although their potential to shed the virus as they move remains unknown.

- It is not known how disease transmission is taking place among the agriculture and wildlife sectors.
- More understanding is needed regarding wild bird migration routes, habitat use, and movements to carefully examine temporal and spatial aspects of outbreaks concurrent with wild bird movements.
- Additional training on wildlife capture and sampling methods is needed in wildlife surveillance strategies, and poultry outbreak investigation from the wildlife angle.
- To date, only one human case of AI H5N1 appears to be related to contact with wild birds, and this was through the plucking of feathers from an infected dead swan.

Looking to the future

In order to address the role of wildlife in the ecology, emergence, and spread of this agriculturally based disease, it is necessary to recognize the importance of integrating experts with training in the fields of ornithology, wildlife ecology, and biology into the transdisciplinary team that addresses the prevention and control of H5N1 occurrence, as well as the epidemiological aspects of transmission among the agriculture and wildlife sectors. Traditionally, ministries for agriculture or veterinary services have been responsible for managing response efforts associated with poultry diseases, but as scientists and other medical personnel come to acknowledge that

wildlife likely plays a role in the ecology of this disease, it is necessary that other ministries with jurisdiction over hunting, wildlife resources, and the environment become part of the solution. In particular, FAO encourages wildlife die-off investigations to be reported properly to the OIE by providing information on the exact geographic positioning system (GPS) location of mortality events (latitude and longitude), common names of birds, and the genus and species. If the species is unknown, a digital photograph can accompany the report to facilitate species identification.

To these ends, FAO encourages all regional and national plans to involve experts from the veterinary, agriculture, and wildlife fields. Programmes must be transdisciplinary, promote collaboration among these differing fields, enhance FAO wildlife surveillance capacity, and address the virus interaction among the agriculture and wildlife sectors.

Two important future needs that FAO is interested in supporting relate to understanding the role of wildlife as:

- 1 **potential carriers or reservoirs of disease**, which will require intensive surveillance activities (wildlife mortality sampling and active surveillance of healthy targeted species) in both wild migratory birds and farm-associated bridge species; and



FRANÇOIS CHIRON

Training on wild bird identification in Ouahigouya, Burkina Faso

- 2 the role of wildlife as **potential spreaders of disease** geospatially, internationally, and between continents which can be further evaluated through ecological studies using telemetry, bird-migration data, and remote sensing information.

The reporting of results from future wildlife surveillance activities should be coordinated through the Emergency Prevention System (EMPRES) for Transboundary Animal and Plant Pests and Diseases programme. FAO encourages results to be shared openly with the scientific community through appropriate channels such the Global Avian Influenza Network for Surveillance (GAINS).

The potential for AI H5N1 virus transmission to humans through hunting, integrated farming practices, and wildlife trade is low, but it does warrant closer examination – especially in terms of disease transmission and spread through live bird markets.

However, based on the best information currently available, wildlife appear to play a relatively minor role in the maintenance and propagation of this disease. As a result, control measures should be focally oriented towards the agricultural sector. Furthermore, FAO maintains a strong position against killing wildlife or altering wildlife habitats in order to prevent or control the spread of the H5N1 HPAI virus. This is a message that FAO encourages all ministries, regional and national programmes to adopt and enforce.

Specific approaches at the regional and national level

- 1 Encourage coordination and collaboration among ministries (ministries of agriculture, environment, and forestry, or others) at a national level to include personnel responsible for (i) disease control and prevention, (ii) agriculture and production, and (iii) wildlife resource management which may include permitting agencies for wildlife sampling, management of hunting organizations, and national park management in addressing the prevention, control, and response activities to H5N1 HPAI virus and other transboundary diseases.
- 2 Provide guidance, encourage training, and facilitate **waterfowl monitoring programmes** in which daily, weekly, and monthly (all year long, and repeated annually into the future) monitoring occurs at important ecological habitats where large densities of birds either roost, congregate, nest, forage, or over-winter. Monitoring should include identification of species present, numbers of individuals, with special attention to tracking numbers of dead birds (species, dates of mortalities, exact location, etc.), maintaining a database of this information, and providing updates to appropriate ministries and the Chief Veterinary Officer (CVO) who can facilitate full investigations and sample collection from sick and dead birds. Reporting of wild bird samples testing positive for AI H5N1 virus findings should be reported to the OIE.

Ducks raised in an open farming system, Viet Nam



AHALUCK BHATIASEVI



- 3 Provide guidance, encourage training, and facilitate establishment of a **wildlife disease surveillance programme** that targets sampling activities focused on identifying potential disease carriers: (i) samples collected from sick or dead birds that are reported by the above described waterfowl monitoring programme; (ii) samples collected through officially sanctioned, routine subsistence or pleasure hunting programmes; (iii) samples collected by capture of free-ranging, apparently healthy wild birds consisting of species most likely to be carriers of H5N1 HPAI virus and other diseases of concern to both agricultural production and human health; and finally, (iv) samples collected from wildlife that are brought into urban or remote trade markets for use as pets or food and that are maintained in markets in close proximity with chicken, duck, goose, or other captive reared birds.
- 4 Establish **wildlife outbreak investigation teams** consisting of trained personnel who can assist in a wildlife capacity in investigating an outbreak at a poultry facility.
- 5 Identify, contribute to, facilitate, and support **wild bird ecology studies** that provide greater insight into detailed migratory bird patterns with the intention of understanding whether wild bird movements coincide geospatially, and chronologically with outbreaks in poultry and other wild birds. Linking ecological data with remote sensing data, and epidemiological information about the poultry and wildlife outbreaks is of the greatest importance in understanding the ecology of the H5N1 HPAI virus and other emerging infectious diseases of agriculture, wildlife, and humans.
- 6 Studies in wild bird ecology and acquisition of samples for testing (other than those linked to avian influenza viruses) can be helpful in understanding the circulation of other pathogens such as: Japanese encephalitis virus, equine encephalomyelitis virus, West Nile virus, or Crimean-Congo haemorrhagic fever.

Socio-economic activities

When planning and executing a comprehensive HPAI control programme in a country or region, the social and economic dimensions of the entire process need to be taken into account. Estimates of global HPAI loss from outbreaks since 2003 run in to billions¹² of US dollars. Decisions made at each stage of an HPAI programme – from prevention of the disease through the entire control and eradication response – have the potential to affect livelihoods significantly, from the poorest to the richest members of society and to have an impact on the long-term sustainability of the poultry sector. These socio-economic issues fall into four broad categories:

- 1 Social and economic impacts of HPAI outbreaks and control measures at all levels.
- 2 Strategies, costs and financing of avian influenza control.
- 3 Trade impacts and market shocks.
- 4 Strategies and technical guidelines for safe poultry production.

In 2005, the Emergency Centre for Transboundary Animal Diseases (ECTAD) convened a Rome-based working group on socio-economics, policy and farming systems. This multidisciplinary team is made up of a core group from FAO, World Food Programme (WFP) and International Fund for Agriculture and Development (IFAD) experts in livestock economics, policy, and markets and trade; poultry production; livelihoods and food security; and communication and knowledge management. The team works in collaboration with others in the UN system, the donor community, NGOs, the private sector, national counterparts and expert consultants to address the socio-economic and policy issues relating to HPAI.

The mandate of the working group is to assess the human dimensions of the HPAI impact on markets, households, livelihoods (with particular attention to the small-poultry producer), food security, and the related institutional challenges of delivering sustainable and cost-effective disease control within poultry production and marketing systems that are evolving and, in some cases, being restructured systematically.

While the immediate focus has been on emergency response, the working group increasingly aims to assess and anticipate the longer-term implications of HPAI disease-control measures. Responding to specific needs that are raised from member countries and other partners, this working group undertakes various studies and reviews as well as preparing technical guidelines and recommendations. This is all with the goal in mind of assessing information that affects everyone in the event of HPAI, from the small producer to the community, country or region, and then all

Disinfection process in a small commercial farm, Indonesia



MOHINDER OBEROI

¹² Commission of the European Communities: "Impact Assessment Avian Influenza" (COM [2005] 171).



stakeholders, including the global community. It also aims to use that information to mitigate and minimize the socio-economic impacts on current and future HPAI-affected areas. Four clusters of activities on socio-economics, policy and farming systems are defined:

1 Addressing the social and economic impacts of HPAI outbreaks and control measures at all levels

The main activities of this cluster are:

- reports on livelihoods and equity impacts, particularly for small-scale producers and those dependent on the poultry sector;
- analysis of food security and nutrition impacts;
- advice on approaches to rehabilitation;
- analysis of impacts of possible changes in the structure of the sector.

Socio-economic impact studies are available under these links:

<http://www.fao.org/avianflu/en/compensation.html>

<ftp://ftp.fao.org/docrep/fao/meeting/011/j8096e.pdf>

<http://www.fao.org/avianflu/en/reviews.html>

A report exploring the food-security impacts of HPAI and its control was used in the preparation of a paper for the Committee on World Food Security (32nd Session) Rome, 30 October–4 November 2006. This can be found at the following link: <ftp://ftp.fao.org/docrep/fao/meeting/011/j8096e.pdf>

2 Analysing strategies, costs and financing of avian influenza control

The main activities of this cluster are:

- advice on compensation strategies appropriate to national situations;
- advice on alternative livelihoods support when compensation programmes alone are insufficient;
- costs and funding mechanisms for HPAI control strategies using alternative approaches to control, and with a range of assumptions about disease epidemiology.

The consultation's aim was to gather practical and operational experience on compensation processes, and to develop guidelines for designing a compensation strategy (see <http://www.fao.org/avianflu/en/compensation.html>). Multiple presentations were made on compensation in the context of regional discussions on good practice. Country reports were produced that advised on design and revision of compensation strategies. These were based on missions to individual countries/regions that have requested FAO assistance – Armenia, Bosnia and Herzegovina, Côte d'Ivoire, Indonesia, Kosovo, Mauritania, Nigeria, Republic of Serbia, Senegal, West Bank and Gaza Strip and an e-consultation was organized on compensation. The results will be published shortly on the FAO website.

The output of the e-consultation contributed to the elaboration of a joint FAO/World Bank/IFPRI/OIE paper on issues and good practices in HPAI control for the use of

Paraveterinarians disposing of dead ducks in a farm with suspect cases of HPAI, Viet Nam



APHALUCK BHATIASEVI



animal health planners and decision makers. The paper "Enhancing control of HPAI in developing countries through compensation: issues and good practice" can be found at: http://www.fao.org/docs/eims/upload/217132/gui_hpai_compensation.pdf

An international conference on the area of compensation is being prepared as a follow-up activity to the HPAI Conference (Bamako meeting, December 2006). The conference is likely to take place during the last week of September or the first week of October 2007. It is anticipated that outputs of the conference will include:

- 1 establishment of operational plans for compensation;
- 2 elaboration of a decision-support tool for policy makers to guide the implementation process of compensation schemes; and
- 3 development of an economic decision-support tool for policy makers to help them decide the most adequate moment for changing the disease-control strategy.

In addition, the socio-economics group has been working on the assessment of costs of vaccination strategies in Côte d'Ivoire, Indonesia and Viet Nam. The team aims to create a tool that can be used by individual countries to evaluate the costs of a given vaccination strategy.

3 Assessing the trade impacts and market shocks of HPAI and other joint activities

This includes:

- a review of national and local shocks in a variety of markets, in terms of price changes and demand fluctuation;
- suggestions for measures that could be taken to mitigate local and national shocks;
- an assessment of economic implications of international market shocks, in terms of trade flows and price fluctuations

Two case studies on market shocks in Egypt and in Turkey were completed by November 2006. In addition, the 21st Inter-Governmental Group (IGG) meeting on meat and dairy products took place in Rome on 13–16 November 2006. The IGG includes a wide range of industry representatives and the symposium explored the extent to which market shocks from disease outbreaks can, or cannot, be mitigated by market practices and government policies.

The IGG session was followed by two symposia entitled "Market and trade dimensions of avian influenza prevention and control" and "Dairy value chains and comparative marketing systems". The information can be found in: http://www.fao.org/es/ESC/en/20953/20999/21495/event_109547en.html

4 Reviewing the poultry sector in targeted countries and formulating strategies and technical guidelines for safe poultry production

The main activities of this cluster are to:

- review poultry sector structures, poultry farming systems, the functioning of the predominant poultry market chains and their importance to producers and different stakeholders (including rural communities);



- identify risks and linkages along the poultry market chain (including the production, distribution and marketing of live poultry and poultry products) that may be critical for HPAI infection of poultry and humans;
- assess the socio-economic impacts of poultry sector restructuring on small-poultry producers and provide guidance in formulating appropriate policy recommendations for HPAI control that respect the needs and conditions of producers;
- investigate and develop strategies for arranging the conservation and protection from unnecessary culling measures of valuable indigenous poultry genetic resources;
- identify opportunities and promote community involvement in the improvement of biosecurity for avian influenza control and prevention strategies, and raise awareness about the disease through community structures, taking into account the technical specificities of the virus (virus shedding in geese and ducks);
- develop technical guidelines on measures to reduce health risks from smallholders' poultry production and provide technical guidance for safe poultry production across various farming systems, marketing and processing facilities.

The main outputs of the cluster so far are:

- practical and affordable husbandry methods for smallholders. Information on the subject can be found at: [http://www.fao.org/ag/againfo/subjects/documents/ai/AIManual_VN2005\(en\).pdf](http://www.fao.org/ag/againfo/subjects/documents/ai/AIManual_VN2005(en).pdf)
- safe and affordable poultry handling for traders and market operators; national poultry sector reviews in seven countries (Benin, Cameroon, Ghana, Mali, Nigeria, Senegal, Togo). Information on the subject can be found at: <http://www.fao.org/avianflu/en/reviews.html>
- regional poultry review for Western Africa and Southeast Asia. More information can be found at: <http://www.fao.org/ag/againfo/subjects/documents/ai/rehabdolberg.pdf>
- duck farming systems reviews in Vietnam and Indonesia.

The results of most of these studies can be found at: <http://www.fao.org/avianflu/en/index.html>

While much has been learned about socio-economic issues, more work is needed in this area. Some specifics are:

- continue to work on the issue of compensation strategies with more countries;
- continue to refine the economic decision support tools elaborated to evaluate the costs of vaccination;
- develop more tools to help the small-poultry producer, especially in the areas of helping them understand HPAI, and how to best reach and communicate with them;
- explore gender issues at the household level in order to provide better access to services, information and training;



- assess the socio-economic impacts of poultry-sector restructuring on small-poultry producers and provide guidance in formulating appropriate policy recommendations for HPAI control that respect the needs and conditions of these producers;
- gain a clearer picture of poultry biosecurity in affected countries with the goal of helping producers upgrade and improve their facilities;
- identify opportunities and promote community involvement in the improvement of biosecurity for avian influenza control and prevention strategies and raise awareness about the disease through community structures;
- develop technical guidelines on measures to reduce health risks from smallholders' poultry production and provide technical guidance for safe poultry production across various farming systems, marketing and processing facilities; and
- work with countries moving into endemic HPAI in order to help them plan their investment and mitigate some of the impact on all stakeholders.





AU-IBAR Strategy for the Prevention and Control of HPAI in Africa

Introduction

The Inter-African Bureau of Animal Resources (IBAR) is a technical specialized office of the African Union (AU) with a mandate to:

- 1 coordinate the control and eventual eradication of epizootics;
- 2 promote livestock development; and
- 3 coordinate and harmonize national livestock policies aimed at creating an enabling environment for a healthy livestock population and therefore an expanded export market.

Accordingly, IBAR has given top priority to the control of the major animal diseases such as rinderpest, contagious bovine pleuropneumonia (CBPP), foot-and-mouth disease (FMD), African swine fever (ASF), *peste des petits ruminants* (PPR) and Newcastle disease. These diseases have been highlighted by the majority of the African countries as the main diseases that constrain livestock development and hence restrict incomes for both small- and large-scale producers. Therefore, strategies for controlling these diseases have been developed and are being implemented at a national level with coordination support from IBAR.

Among animal diseases threatening the African continent, due attention should be paid to HPAI since it causes high mortality in poultry – the primary source of income and protein, especially in rural areas. The manner in which the disease spreads rapidly at national and regional levels is not yet clearly understood. After analysing the threat to Africa from this disease and its potential impact on poverty alleviation on the continent, AU-IBAR in partnership with the FAO, OIE and other stakeholders, has taken the necessary steps in preparing the continent to combat HPAI.

Why a strategy for Africa?

In Africa, systems for effective disease-surveillance systems for both animal and human health are weak, and the capacity of veterinary services to ensure early detection and rapid response to outbreaks in livestock is limited. Moreover, public health systems are inadequately prepared to cope with outbreaks of human cases in many African countries.

This epidemiological situation led AU-IBAR, OIE and FAO to reconsider the proposed strategy for prevention and control of HPAI in Africa. The first step was the convening of a conference on HPAI in Nairobi, Kenya, in September 2005 to review the disease situation and assess the risk factors underlying possible introduction of the disease into the continent. Among others, the meeting recommended the formulation of an AU-IBAR strategy for the prevention and control of the disease. The strategy that was subsequently devel-

Workshop participants,
Nairobi, Kenya



BIDJEH KEBKIBA

oped in line with the FAO/OIE Global Strategy for the Progressive Control of Highly Pathogenic Avian Influenza was adopted by the Conference of Ministers responsible for Animal Resources in Africa at Kigali in October 2005. The strategy aims at preventing the introduction of avian influenza into unaffected regions of Africa or minimizing the socio-economic and public health impacts in those countries that are already infected.

AU-IBAR short, medium and long-term Pan-African Action plan for the prevention and control of HPAI

Short-term action

1 Investigation

- Organize a seminar to sensitize national veterinary services on the epidemiology, surveillance, diagnosis, prevention and control of avian influenza, in particular HPAI.
- Undertake targeted surveys (clinical, serological and virological) to assess the current status with regard to HPAI, according to the epidemiological situation, particularly with regard to trade exposure and migration of wild birds.
- Liaise with international organizations e.g. FAO, OIE and other organizations to promote HPAI investigations in order to:
 - Assess the status of the continent with regard to HPAI.
 - Undertake research on assessment of the potential role of wildlife (birds, warthogs, bush pigs) and aberrant species in the epidemiology of HPAI in Africa.

The protocol for the full disease investigation to follow up will be in accordance with AU-IBAR established guidelines.

2 Emergency preparedness

- Create awareness among all stakeholders.
- Update the HPAI epidemiological situation in Africa.
- Elaborate national and regional emergency preparedness plans.
- Prepare African experts in rapid containment of HPAI outbreaks.
- Establish vaccine stocks and emergency funds at AU-IBAR level.
- Assist countries in developing national strategies and plans in coherence with FAO/OIE global strategy according to epidemiological conditions and production systems.

Emergency training ("train the trainer" approach) in monitoring and surveillance of HPAI in wild birds.

- Develop strategy for monitoring and surveillance of HPAI in Africa (localization, sampling sites, reporting).
- Provide laboratory training (molecular biology techniques).
- Offer epidemiology training (sampling strategy, tracking of infection).
- Train infectious disease specialists (prevention of virus spread, vaccination strategy including delivery and post-vaccination monitoring).

Laboratory training workshop session, Nairobi, Kenya



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Medium-term action

Disease surveillance (passive and active) in domestic and wild birds

- Establish epidemio-surveillance systems (ESS) where these are not in place.
- Strengthen the established ESS under the Pan African Programme for the Control of Epizootics (PACE) and expand to HPAI.
- Revitalize the existing formal ESS.
- Establish ESS in countries with complex emergency situation (Liberia, Sierra Leone and Somalia).
- Assist countries in the effort to strengthen their veterinary services.

Long-term action

- Maintain the “free from HPAI” status of member states.
- Organize a regional conference to finalize the preparation of a continental strategy for the prevention and control of HPAI.
- Liaise with research institutes to contribute to the definition of a research agenda with regard to HPAI, and promote its implementation.
- Reinforce and expand the geographical coverage of the surveillance networks under PACE, and include HPAI beyond EU-funded PACE.
- In collaboration with FAO, OIE, cooperating partners and donor agencies, raise the necessary funds to support:
 - the National Veterinary Services of AU member states to strengthen their HPAI surveillance and diagnostic capacities;
 - prevention and control measures, capacity, institutional building and epidemiological networking to ensure that an early detection, early warning and early response systems are in place.
- Liaise with research institutes (such as Onderstepoort Veterinary Institute [OVI], Centers for Disease Control and Prevention [CDC] and the International Livestock Research Institute [ILRI]) to undertake activities in the fields of:
 - development of vaccines using local virus strains;
 - development of diagnostic tools and their field validation, especially for differentiating between avian influenza and Newcastle disease.
- In close collaboration with national agricultural research institutes, undertake socio-economic impact assessment and risk analysis of HPAI in selected member states.
- Using GIS, define density, locality of wild birds and migratory routes in Africa (in collaboration with ILRI).

Strategic communication in support of the FAO-OIE Global Strategy for the progressive control and elimination of avian influenza

The world has now experienced, and witnessed, several waves of H5N1 HPAI and its implications, for both animals as well as humans. From a communication perspective, at least four major categories of “audiences” now exist across the globe:

- 1 The millions of rural families/households who directly experienced their entire poultry flocks being culled, and with it, at least temporarily, perhaps their source of livelihood and food security.
- 2 The millions who “experienced” the effect of H5N1 HPAI outbreak prevention/containment operations through the media and information channels, without necessarily developing a full understanding of the reasoning and science behind the control response.
- 3 The thousands of commercial and semi-commercial poultry farmers, as well as allied sectors (animal-feed suppliers, transporters, traders), who directly experienced the impact of market shocks because of a sudden and large-scale drop in consumer demand, following announcements of the H5N1 HPAI outbreaks, but who still do not have a clear understanding of the disease.
- 4 A vast and unknown number of people who have neither experienced an outbreak response directly, nor witnessed it through the media.

Again, from a communication perspective, the current and future behavioural intent of all these “audiences” and their participation and compliance in future outbreak responses is unknown. This unknown element constitutes a significant weakness in global “preparedness” in responding to HPAI outbreaks, and redressing this weakness falls squarely in the communication domain.

There is an urgent need to rethink and expand upon the current HPAI communication discourse, based on a deeper understanding of the impact and nature of the interaction between the current disease-control measures, geopolitics, livelihoods, markets, and socio-cultural practices. Communication for Development approaches – including stakeholder dialogue, public participation, and community empowerment – need to be brought to bear on the current prevention and control measures used for avian influenza, to stop the disease “at source”, and to prevent the emergence of a human pandemic.

There is an urgent need to bring together a highly experienced, multidisciplinary panel of experts to conduct a meta-analysis of disease data, opinions and lessons from a multitude of country-assessment missions, prospective and retrospective studies, grassroots-level participatory action research, and policy/media advocacy, from institutional, private sector as well as community perspectives. This will provide policy direction and guidance for strategic communication interventions to stop HPAI.

Broadly, the strategic advocacy and communication goals for the global, regional, national or subnational levels can be articulated as:

Public service posters promote good hygiene as a way to prevent avian influenza transmission



FAO/H.D. NAM



- Catalyzing greater societal ownership and public participation in regional/national avian influenza responses, **including the wide-scale adoption of safe poultry practices and preventive behaviours**, to reduce the risk of virus transmission and spread.
- Instilling a sense of urgency within policy domains to ensure **full preparedness and strengthened communication capacities at all levels** for the rapid roll-out of response interventions in the short as well as longer term, including the mobilization of adequate resources.
- **Protecting livelihoods and mitigating poultry market shocks and negative consumer reactions** as well as minimizing market-recovery time, following any announcements of avian influenza outbreaks in poultry in a region or individual countries.

Towards achieving these goals, the following recommendations are proposed, as expected outcomes from this special session:

- 1 A comprehensive and systematic, multidisciplinary analysis of the AI communication interventions to date and their effectiveness should be conducted on a priority basis. Findings from this analysis should form an authoritative basis for the design of future communication strategies and interventions.
- 2 A mechanism, with adequate resources and agreed procedures, for the systematic sharing/management of knowledge and information being generated on communication interventions needs to be established.
- 3 A unified approach, backed up by the establishment of decentralized resource centres, needs to be developed for providing technical assistance in rapidly building/strengthening HPAI communication capacities within countries and across institutions.
- 4 Establishing indicators, baselines and benchmarks, to assess progress and the contribution of communication in the prevention and control of HPAI. Additionally, there is also a strong need for developing guidance for adequate resource allocations for communication activities. The communication constituency, including communication experts and practitioners, needs to take leadership in engaging with donors through a common platform, for agreement on measures of progress and the filling of resource gaps, through a unified approach.
- 5 Practical mechanisms for greater policy engagement and dialogue, between national authorities, the private poultry sector, and community poultry keepers/producers, needs to be advocated for and established, to ensure a common understanding and vision, with regard to rural livelihoods, nutritional and food security, biosecurity, and poultry-sector organization.
- 6 Multisectoral and multistakeholder partnerships, at global and national levels, along the lines of other successful models (e.g., the Stop TB¹³ Partnership, the Polio Eradication Initiative, the Global Environment Facility, etc.) should be encouraged, to ensure wider participation from civil society, community networks, the media, and the private sector.

FAO is playing a key role in helping advocate for, and achieving the goal of stopping HPAI at its source.

¹³ TB: tuberculosis.



Meetings and publications

Meetings and events

2005

2nd FAO/OIE Regional Meeting on Avian Influenza control in Asia, Ho Chi Minh City, Vietnam 23–25 February 2005. More information available at:

http://www.fao.org/ag/againfo/subjects/documents/ai/AI_2nd_RegMtg_HoChiMinhCity_Rep.pdf

OIE/FAO International Scientific Conference on Avian Influenza, 7–8 April 2005, Paris, France. More information available at:

http://www.fao.org/ag/againfo/subjects/documents/ai/OIE_FAO_Recom_05.pdf

FAO/WHO/OIE/World Bank Conference on Avian Influenza and Human Pandemic Influenza, 7–9 November 2005, Geneva, Switzerland. More information available at:

http://www.fao.org/ag/againfo/subjects/en/health/diseases-cards/speech_geneva.html

2006

International Pledging Conference on Avian Influenza and Human Pandemic Influenza, 17–18 January 2006, Beijing, China. More information available at:

<http://web.worldbank.org/WBSITE/EXTERNAL/PROJECTS/0,,contentMDK:20765526~menuPK:2077305~pagePK:41367~piPK:51533~theSitePK:40941,00.html>

6th International Symposium on Avian Influenza, 3–6 April 2006, St John's College Cambridge, United Kingdom. More information available at:

<http://www.defra.gov.uk/corporate/vla/aboutus/aboutus-ai-p1.htm>

FAO/OIE International Scientific Conference on Avian Influenza and Wild Birds, 30–31 May, 2006, Rome, Italy. More information available at:

http://www.fao.org/ag/againfo/subjects/en/health/diseases-cards/conference/index_en.html

Senior Official Meeting on Avian and Human. Pandemic Influenza, 6–7 June 2006, Vienna, Austria. More information available at:

http://ec.europa.eu/health/ph_threats/com/Influenza/SOM_Vienna.pdf

Symposium on: Market and Trade Dimensions of Avian Influenza Prevention and Control, 14 November 2006, Rome, Italy. More information available at:

http://www.fao.org/es/ESC/en/20953/21014/21574/event_109566en.html

4th International Conference on Avian Influenza, 6–8 December 2006, Bamako, Mali. More information available at: <http://www.avianinfluenzaconference4.org>



2007

Vaccination: A Tool for the Control of Avian Influenza, 20–22 March 2007, Verona, Italy.

More information available at:

<http://www.avianfluvaccine2007.org>

International Animal Health Communicators' Roundtable in Support of the FAO/OIE Global Strategy for the Prevention and Control of Highly Pathogenic Avian Influenza, 16–19 April 2007, Rome, Italy. More information available at:

http://www.fao.org/docs/eims/upload/226712/agenda_HPAI_comtable.pdf

2nd International Symposium on Animal Disease Control in the 21st Century, 23–25 April 2007, Greifswal-Insel Reims, Germany. More information available at:

http://www.oie.int/download/ANNOUNCEMENT_MEETING/Animal_Disease.pdf

Technical Meeting on Highly Pathogenic Avian Influenza on Human H5N1 Infection, 27–29 June 2007, Rome, Italy. More information available at:

<http://www.fao.org/avianflu/en/conferences/june2007/index.html>

Association of Institutions for Tropical Veterinary Medicine (AITVM), 12th International Conference, 20–23 August 2007, Montpellier, France. More information available at: <http://aitvm2007.cirad.fr/>

International Conference on Avian and Pandemic Influenza, 4–6 December 2007, New Delhi, India.

FAO Animal Production and Health publications

New publications available on FAO Animal Production and Health publications list for HPAI:



FAO Animal Production and Health manual: *Wild Bird HPAI Surveillance. Sample collection from healthy, sick and dead birds (2006)* (available at http://www.fao.org/docs/eims/upload/218650/manual_wildbird_en.pdf)

FAO Animal Production and Health manual: *Preparing for Highly Pathogenic Avian Influenza (2006)* (available at http://www.fao.org/docs/eims/upload/200354/HPAI_manual_en.pdf)

These and other FAO documents can be purchased through FAO sales agents.

A complete list of publications and prices is available at: <http://www.fao.org/catalog/inter-e.htm>



June 2007

Stop the press

Information presented in this bulletin concerns occurrences of HPAI reported up to December 2006

In December 2006, a “new wave” of HPAI outbreak occurred in a number of countries; and from January to June 2007 H5N1 HPAI outbreaks were reported to the World Organisation for Animal Health (OIE) and the Food and Agriculture Organization (FAO) in poultry and/or wild birds in Africa (Egypt, Nigeria and recently in Ghana and Togo); Asia (Afghanistan, Bangladesh, Cambodia, China, Japan, Lao People’s Democratic Republic, Myanmar, Pakistan, Republic of Korea, Thailand and Viet Nam); Europe (Hungary, Turkey, United Kingdom and Russian Federation); and the Near East (Kuwait [wild and domestic birds] and Saudi Arabia [ostriches]).

New cases have recently been reported in countries that had previously been unaffected by the disease since 2003, the beginning of the avian influenza crisis. In March 2007, Bangladesh reported its first case. Since then, despite culling and the banning of the movement of poultry in areas with confirmed outbreaks, the virus has been spreading in poultry flocks across the country’s farms. Since the detection of the virus on 5 February 2007 in Bangladesh, and up to 28 May 2007, more than 140 000 chickens have been culled on more than 50 farms in 11 districts. In March 2007, Saudi Arabia reported its first H5N1 HPAI case in ostriches. Ghana reported the disease in commercial poultry layers in May 2007.

From 1 January to 31 May 2007, human cases of avian influenza A(H5N1) were reported to the World Health Organization (WHO) by Cambodia, China, Egypt, Indonesia, Lao People’s Democratic Republic and Nigeria with a total of 29 deaths out of 46 cases. Most of the cases were found in Egypt (16 cases/4 deaths) and Indonesia (23 cases/20 deaths).

For more information see: <http://www.fao.org/ag/againfo/programmes/en/empres/home.asp>



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