



# REPORT

## September 2008

GLOBAL PROGRAMME FOR THE  
PREVENTION AND CONTROL OF  
HIGHLY PATHOGENIC AVIAN INFLUENZA



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*The HPAI situation has significantly improved in the past year, and the majority of infected countries have eliminated the infection or are currently controlling the disease. Only Indonesia and Egypt still remain of concern. However, the fight must continue, as the virus still has the potential to cause a pandemic. FAO has significantly contributed to the progress made to date and remains fully committed to the task at hand.*

**Joseph Domenech**  
**Chief Veterinary Officer**  
**Chief Animal Health Service - FAO**

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# Executive Summary

Since its emergence in late 2003 – early 2004, highly pathogenic avian influenza (HPAI) has caused global concern as an extremely infectious disease threatening animal and human health and the livelihoods of the most vulnerable. In response, the Food and Agriculture Organization of the United Nations (FAO), together with the World Organisation for Animal Health (OIE), has led international efforts to facilitate the prevention and control of HPAI at its source in animals. FAO has applied its technical expertise and operational capacity to respond to the HPAI emergency at all levels with an emphasis on providing direct assistance to Member Nations. This progress report: (i) reviews FAO activities implemented from January to September 2008 through the Organization's Global Programme for the Prevention and Control of HPAI revised in December 2007; and (ii) provides an overall assessment of country capacities for HPAI prevention and control.

Due in part to the significant efforts of governments and the international community with the support of FAO's Global Programme, affected and at-risk countries on the whole have improved their capacities to fight HPAI. These capacities have facilitated the progressive decrease of the disease pathological pressure worldwide. Since January 2008, fewer countries (i.e. 20 nations in September 2008) have reported infection or re-infection. Reported numbers of outbreaks and cases indicate the disease situation has been brought under control worldwide except in Indonesia and Egypt. The World Health Organization (WHO) has reported a downward trend in the number of human cases as a result of better control at the animal source. Moreover, the widespread creation of government preparedness plans dedicated to avian influenza show global awareness and transparency have improved.

Part 1 describes FAO's Global Programme in the context of: the FAO/OIE Global Strategy for the Prevention and Control of HPAI, the overall United Nations coordinated effort, and the current disease situation. Composed of 90 ongoing projects in 130 countries, FAO's current Global Programme focuses on a wide spectrum of initiatives. In particular FAO has emphasized preparedness, surveillance and laboratory activities. FAO has worked to generate a better understanding of disease epidemiology including virus dissemination by monitoring of wild bird migratory pathways. The Organization has provided technical assistance to build animal health communication capacities. In line with the December 2007 revision of the Programme promoting a holistic approach, FAO has placed increased emphasis on (i) biosecurity to assess the situation both at farm and market levels and (ii) socio-economics to shed light on economic impacts of HPAI and cost benefit analysis of surveillance and control programmes.

Part 2 provides an overall assessment of government capacities to prevent, detect and respond to HPAI in the 54 countries where FAO has been implementing HPAI initiatives. Data were analysed against nine key capacities, including: (i) planning and preparedness; (ii) surveillance; (iii) laboratory diagnostics; (iv) response; (v) vaccination; (vi) compensation;

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(vii) farm biosecurity; (viii) coordination (i.e. intersectoral and cross-border); and (ix) communication. Results have shown that overall capacities to prevent and control HPAI are improving in many countries surveyed. However, the assessment has revealed a number of persistent challenges to be addressed. In approximately 22 percent of infected or at-risk countries, FAO has found national animal health systems insufficient to mount effective prevention and control programmes. Under-reporting has also continued to reduce the reliability of animal and human health assessments.

Part 3 provides an overview of activities in Asia, Africa, Eastern Europe, Latin America and the Middle East. FAO activities in these regions have been critical to helping countries develop the critical assets necessary to promote HPAI prevention and control.

The current Programme completes its third and final year in 2008. FAO is working with donors and partners to mobilize funding to sustain and continue Programme activities in support of member countries. In this context, FAO plans to develop an updated Programme for 2009–2011 that is in line with the revised FAO/OIE Global Strategy and the expected conclusions from the International Ministerial Conference on Avian and Pandemic Influenza to be held in Sharm el Sheikh in October 2008.



## PART 1

# Background and update

## THE FAO'S GLOBAL PROGRAMME FOR THE PREVENTION AND CONTROL OF HPAI

### Overview of the Programme

Following the outbreak and spread of the H5N1 virus strain of highly pathogenic avian influenza (HPAI) in Southeast Asia in early 2004, the Food and Agriculture Organization of the United Nations (FAO) and the World Organisation for Animal Health (OIE), in consultation with the World Health Organization (WHO), developed joint FAO/OIE strategy known as the *Global Strategy for the Prevention and Control of Highly Pathogenic Avian Influenza*.

This strategy has been updated in March 2007<sup>1</sup> to reflect the increased understanding of the disease over the past years and better address the holistic dimension of the disease. An updated version with the latest developments on the disease has been scheduled for release in advance of the International Ministerial Conference on Avian and Pandemic Influenza to be held in Sharm el Sheikh, Egypt, 24–26 October 2008<sup>2</sup>.

To meet FAO's responsibilities under the *Global Strategy*, the Organization developed a *Global Programme for the Prevention and Control of Highly Pathogenic Avian Influenza*. This programme presents the Organization's approach to addressing the needs for control of the current epizootic of HPAI over a three-year period (i.e. 2006–2008). FAO has revised and updated the Programme regularly to reflect the changing disease situation and the evolving Global Strategy. FAO last updated the Global Programme in December 2007.

Consistent with the Global Strategy, the Global Programme was structured to operate simultaneously in three interlinked levels: global, regional and national. The implementation of the programme has entailed a multidisciplinary approach, integrating animal health, socio-economics, farming systems, wildlife and communication into coordinated approach for HPAI prevention and control. While the Programme has taken into account the emergency assistance required to respond to requests from countries recently infected or re-infected, it has also remained committed to the long-term control and eradication of the disease in line with the Global Strategy's ten-year vision. By focusing on both emergency response and longer-term actions, FAO has been implementing the Global Programme to facilitate HPAI prevention and control in animals while helping protect the livelihoods of affected human populations.

FAO has mobilized Global Programme funding for a range of operational and technical

<sup>1</sup> Available on the FAO Avian Influenza web site (<ftp://ftp.fao.org/docrep/fao/010/a1145e/a1145e00.pdf>)

<sup>2</sup> Available on the FAO Avian Influenza web site (<ftp://ftp.fao.org/docrep/fao/010/ai380e/ai380e00.pdf>)

activities, including: (i) the provision of technical expertise; (ii) training and capacity building; and (iii) veterinary infrastructure reinforcement. The Programme has also assisted Member Nations in the development of early warning, efficient detection and rapid response capacities for HPAI prevention and control. Since the start of the Global Programme, more than 130 countries have benefited from FAO assistance, either through specific interventions at the national level or through regional support.

FAO expertise within the Global Programme has involved a wide range of areas, including support for: (i) disease control strategy development; (ii) preparedness planning; (iii) surveillance and epidemiological investigations; (iv) laboratory diagnostics; (v) wild birds surveillance and monitoring; (vi) depopulation; (vii) movement control; (viii) farm biosecurity; (ix) vaccination; and (x) policy development for national compensation schemes and safer poultry production. Furthermore, FAO has focused its expertise on all aspects of the value chain, assessing socio-economic effects on the animal health sector and the people directly and indirectly affected. FAO has also made the communication of appropriate disease prevention and control strategies a cross-cutting component of the Global Programme.

### **Global and regional Coordination of the Programme**

FAO has established a number of specific mechanisms to promote a coordinated and efficient global response to HPAI.

#### **GLOBAL COORDINATION**

The Emergency Centre for Transboundary Animal Diseases Operations (ECTAD), established at FAO headquarters in 2004, is the umbrella body for the implementation of the Global Programme (see organigram in Annex 1). ECTAD has coordinated FAO's global effort to facilitate the ability of member countries to conform to internationally agreed plans for HPAI control. ECTAD has coordinated activities at the global level while facilitating improved synergies at the regional level and accommodating specific needs at the national level. ECTAD has facilitated the harmonization of regional approaches for early warning, efficient detection and timely response to HPAI, and ECTAD has provided countries with technical inputs through capacity building and technical support.

#### **JOINT GLOBAL INITIATIVES**

Global activities have also included technical support provided by joint initiatives such as the Global Early Warning and Response System for Transboundary Animal Diseases (GLEWS) of FAO, OIE and WHO, the OIE/FAO "Network of Reference Laboratories, Epidemiology Centres and Groups of Experts on Avian Influenza and the Crisis Management Centre – Animal Health (CMC-AH). The latter has deployed rapid assessment and response missions to help governments respond rapidly to HPAI outbreaks or critical epidemiological situations in countries newly infected or highly at-risk of infection.

#### **REGIONAL AND NATIONAL COORDINATION**

Regional and national activities have been coordinated through ECTAD's decentralized units and the joint FAO/OIE Regional Animal Health Centres (RAHCs) established in Africa and Middle East (see the geographical coverage of the currently established RAHCs in Annex 2).

Conducting activities at the regional level has complemented national support, facilitated the sharing of best practices and expertise, and enabled economies of scale. For those countries where HPAI has become endemic, FAO has established country ECTAD units to help manage the disease and minimize the secondary effects of HPAI throughout the animal health sector and for associated stakeholders.

### **COORDINATION WITH GLOBAL AND REGIONAL PARTNERS**

In implementing the Global Programme, FAO has worked closely with OIE and regional organizations involved in animal health. FAO has also collaborated with WHO in light of HPAI's threat to human health and with the United Nations Children's Fund (UNICEF) for grassroots communication. FAO and the other United Nations (UN) agencies work under the umbrella of the office of the United Nations System Influenza Coordinator (UNSIIC). FAO played a key role in the formulation and development of UNSIIC's Consolidated Action Plan, the objective of which has been to coordinate UN efforts in the global fight against avian and human pandemic influenza. The Consolidated Action Plan was last updated in September 2007. FAO has continued to contribute to UNSIIC/World Bank progress reports by providing significant inputs and case studies from the avian influenza field programme. UNSIIC has planned to release the fourth global progress report in advance of the above-mentioned International Ministerial Conference in October 2008.

In addition, FAO has collaborated closely with other international institutions involved in combating HPAI. These have included: the Asian Development Bank (ADB), the European Commission (EC); the United States Agency for International Development (USAID) and the World Bank, as well as strategic donors and regional bodies such as the Association of Southeast Asian Nations (ASEAN) and the African Union/Interafrican Bureau of Animal Resources (AU/IBAR)

## **Funding update**

### **CURRENT FUNDING STATUS**

In March 2006 FAO estimated the Global Programme's funding requirements at USD 308.5 million over a three-year period. As of September 2008, FAO has mobilized support for 144 donor- and/or FAO-funded projects worth an estimated USD 209.1 million. This has left an approximate funding gap of USD 99.4 million up to the end of 2008. However, FAO has been negotiating a further 33 donor-funded projects valued at over USD 72.4 million to cover some programme activities planned for 2008 and beyond (see Table 1).

TABLE 1  
**Current funding shortfall for Global Programme (as of 30 September 2008)**

<b>Totals</b>	<b>Total (USD )</b>
Funds requested	308,506,363
Funds received	209,138,486
Funding GAP up to end of 2008	99,367,877
Funds in pipeline	72,411,530

**GEOGRAPHIC ALLOCATION**

Donors frequently earmark funds for particular countries or regions according to their priorities and the emergency in question. The most substantial commitment of Programme funds has been to assist countries in Asia and to some extent Africa, although a significant portion of funding has been allocated to global projects (i.e. projects that support countries in various regions of the world).

**FAO'S TECHNICAL COOPERATION PROGRAMME**

FAO allocated USD 9.1million of its own funds to the Global Programme through 26 national and regional emergency projects under the Organization's Technical Cooperation Programme (TCP). These projects, developed for and implemented in Africa, Asia, Eastern Europe, Latin America and the Caribbean and the Middle East, formed the core of FAO's first reaction to the HPAI crisis during the early phase before donor funding became available. This financial commitment reflected the seriousness with which FAO viewed the HPAI crisis and provided a signal to donors of the scale of investment required to combat and eradicate the HPAI threat.

**DONORS**

FAO's Global Programme receives financial support from the Governments of: Australia, Canada, the Federal Republic of Germany, the French Republic, the Hashemite Kingdom of Jordan, the Hellenic Republic, Ireland, Japan, the Kingdom of Belgium, the Kingdom of the Netherlands, the Kingdom of Norway, the Kingdom of Saudi Arabia, the Kingdom of Spain, the Kingdom of Sweden, New Zealand, the People's Republic of China, the Republic of Italy, the Swiss Federation, the United Kingdom of Great Britain and Northern Ireland and the United States of America. The Global Programme is also supported by contributions from the: ADB, Common Humanitarian Fund (CHF) for Sudan, EC, Organization of the Petroleum Exporting Countries (OPEC) Fund for International Development, United Nations Assistance Programme (UNAP) to Afghanistan, United Nations Development Group Office (UNDGO), United Nations Development Programme (UNDP), UNDP Administered Donor Joint Trust Fund, and World Bank (see Table 2).

TABLE 2  
Global Programme funding (30 September 2008)

Donor	USD million
USA	68.38
Sweden	17.59
Australia	14.27
Japan	13.52
European Commission	10.47
United Kingdom	10.22
Canada	9.48
Germany	9.43
FAO	9.18
Asian Development Bank	7.99
UNDP (UNJ)	6.76
France	6.74
World Bank	4.45
Norway	3.70
Switzerland	3.70
Belgium	2.83
Nepal	2.39
Spain	1.68
Saudi Arabia	1.00
Vietnam	0.80
UNDG/EXECCOM	0.76
OPEC	0.70
Netherlands	0.63
China Peoples' Republic	0.50
UNDP	0.46
New Zealand	0.34
Ireland	0.32
CHF	0.30
Italy	0.29
Greece	0.19
Jordan	0.04
UNAP	0.02
<b>TOTAL</b>	<b>209.14</b>

### **SPECIAL FUND FOR EMERGENCY AND REHABILITATION ACTIVITIES**

When emergency situations require rapid FAO assistance, the Organization enhances its capacity to react rapidly by drawing on the Special Fund for Emergency and Rehabilitation Activities (SFERA).

Established in April 2004, SFERA provides funds that are not necessarily tied to specific programmes or geographic areas. In the context of HPAI prevention and control activities, many of which require a rapid start and resist pre-planning, SFERA has helped kick-start initiatives by providing funds that can be allocated in a timely fashion to meet the needs and priorities of the moment. The SFERA facility has played a pivotal role in shaping a strategic and programmatic FAO response that is more flexible and more efficient than solutions based solely on tied funding.

As of 30 September 2008, ten donors had contributed over USD 40.8 million to SFERA for HPAI operations, representing almost 20 percent of FAO's total funding portfolio for HPAI activities (see Table 3). SFERA funding has supported country-specific initiatives as well as regional and global coordination activities. The Fund has also supported a wide range of operational and technical activities, including the: (i) provision of laboratory supplies, veterinary equipment and other HPAI disease control essentials; (ii) recruitment of technical experts for country field missions; (iii) coverage of travel costs; (iv) organization of meetings and conferences; and (v) establishment of the CMC-AH at FAO headquarters.

**TABLE 3**  
**Donor funding for SFERA (30 September 2008)**

<b>Donor</b>	<b>Amount (USD)</b>
Sweden	17.59
United Kingdom	6.94
France	6.64
Switzerland	3.70
Norway	3.51
Saudi Arabia	1.00
OPEC Fund for International Development	0.70
China	0.50
Greece	0.19
Jordan	0.05
<b>TOTAL</b>	<b>40.81</b>

### **DISEASE SITUATION UPDATE (JANUARY – SEPTEMBER 2008)**

The avian influenza epidemic, caused by the H5N1 strain, started five years ago in Asia. Since that time, the disease has affected over 60 countries in Africa, Asia and Europe. The vast majority of countries have reported to have eliminated the virus in poultry, although

HPAI remains endemic in some countries (i.e. Egypt and Indonesia). Except for a few cases in wild birds in China (i.e. China, Hong Kong SAR), Europe and Japan, most of the confirmed outbreaks occurred in domestic poultry. The disease has affected diverse species of poultry, including: chickens, ducks, geese, guinea fowl, pheasants, pigeons and turkeys.

During 2008, WHO reported 36 human cases (28 fatal) in five countries: Bangladesh (1), China (3), Egypt (7), Indonesia (20) and Viet Nam (5). Since the beginning of the epidemic, WHO has reported a total of 387 cases of human infections, of which 245 have been fatal (September 2008).

The weekly incidence of HPAI (H5N1) outbreaks in poultry and cases of H5N1 infection in wild birds as reported from January and September 2008 are presented in Figures 1 and 2. HPAI (H5N1) outbreaks in poultry and cases in wild birds as reported during the period from January to September 2008 are shown in figure 3.

## Africa

HPAI is now considered endemic in **Egypt**, where the current epidemic was first confirmed on 17 February 2006. Since then the disease has been confirmed in 22 out of the 27 Governorates. The outbreaks – mainly in backyard poultry – were detected from north to south in the areas adjacent to the Nile river. WHO has reported seven human cases of H5N1 infection (three of them fatal) in 2008.

In **Nigeria**, after nearly ten months without a reported outbreak, new HPAI cases were confirmed in Kano and Katsina States on 24 July 2008. Earlier, during one of the regular surveillance and disease search exercises in the poultry production system and marketing chains across the country, positive cases were discovered in live bird markets in Gombe and Birin Kebbi. The virus in these markets was isolated from ducks and characterized genetically as belonging to sublineage EMA3 within clade 2.2. Never before reported in Africa, strains in the EMA3 sublineage genetically differ from the strains that circulated in Nigeria in 2006 and 2007. They are more related to the A/H5N1 strains that circulated in Europe (i.e. Italy), Asia (i.e. Afghanistan) and the Middle East (i.e. Iran) in 2006. It remains unknown how this strain was introduced to the continent, whether through wild bird or domestic poultry movement. Had migratory birds been the cause, they would have introduced the virus during the migratory period that commenced in September 2007 and ended with spill over into the poultry sector at a later date. There has been no indication that the EMA3 sublineage is more (or less) virulent than other viruses that cause HPAI of the H5N1 strain.

After no reported HPAI activity in **Togo** since December 2007, the Government notified OIE of an outbreak in three closely clustered poultry farms. The outbreak occurred in September in Agbata (i.e. the same location than the previous outbreak in December). Genetic analysis did not reveal known mutations related to mammalian host adaptation or to antiviral drug resistance in the Hemagglutination (HA) and Neuraminidase (NA) genetic segments of the isolate. Genetic characterization of the HA and NA genes linked the virus clusters to the H5N1 viruses isolated in Togo in June 2007. The similarity ranged from 99.2 to 99.3 percent for the HA gene and from 98.7 to 98.8 percent for the NA gene.

## Asia

HPAI is actively circulating in some hotspots in Asia. **Indonesia** has experienced a high number of cases of HPAI type H5N1 in poultry in the last three years. HPAI remains endemic in Bali, Java, South Sulawesi and Sumatra, with sporadic outbreaks also reported in other areas. HPAI is considered endemic throughout most of Indonesia, though with widely varying prevalence. Only two of the Government's 33 provinces are considered to be free from infection. The high figure of reported cases for Indonesia in 2007–2008 can be explained thanks to the participatory disease search (PDS) programme, which has been highly effective at detecting outbreaks. Outbreaks have been reported infrequently from the eastern provinces, where H5N1 HPAI prevalence likely to be is more sporadic in the smaller, more dispersed poultry populations. Twenty cases (17 fatal) were reported during 2008. Of the 135 human cases confirmed to date in Indonesia, 110 have been fatal.

After signalling outbreaks throughout **Bangladesh** for several months, the Government reported the epidemic under control after the last outbreak in May 2008. As of 30 June, a total of 287 outbreaks had been recorded in 47 out of 64 districts. These included 245 outbreaks in commercial farms and 42 outbreaks in backyard poultry production systems. The total number of depopulated birds was estimated to exceed 1.6 million animals. The first and only human case of H5N1 infection in Bangladesh occurred in January 2008.

The Government of the People's Republic of **China** last reported HPAI on 17 June 2008 in Yashan Village in the southern province of Guangdong. The outbreak was China's seventh in 2008 and Guangdong's second since 13 March. A total of 3 873 ducks died and an additional 17 127 ducks were depopulated. According to the local ministry, emergency measures were taken and the epidemic was brought under control. Guangdong Province also provides a significant amount of poultry to China, Hong Kong SAR, where HPAI was detected in live bird markets in early June for the first time in five years. Attempting to control the spread of the virus in China, Hong Kong SAR, the Government conducted mass depopulation activities and temporarily banned the movement of live poultry to and from the mainland. Outbreaks were also reported in 2008 in Tibet and in the southern province of Guizhou. In addition to the affected live bird markets, the Government has reported six cases of H5N1 infection in wild birds in China, Hong Kong SAR this year. In addition, three fatal human cases of H5N1 infection have been reported.

In January 2008, **India** experienced its worst HPAI outbreak to date, which was reportedly controlled through an aggressive depopulation campaign. HPAI re-emerged in March in West Bengal, and in May a new state (i.e. Tripura) experienced three HPAI outbreaks. One of the outbreaks occurred just 500 metres from India's border with Bangladesh. No additional outbreaks have been reported since mid-May.

During April and May 2008, the Government of **Japan** reported that five wild swans had tested positive for H5N1 infection in the prefectures of Akita and Hokkaido. No outbreaks have been detected in poultry to date.

After no reported HPAI activity since March 2008, the Government of the **Lao People's Democratic Republic** detected an outbreak in ducklings on 27 August in Nambak, Luang Prabang. Located in a small commercial unit within a village with backyard poultry, the ducks had been purchased from the neighbouring province (i.e. Oudomxay), which also shares a border with China. A surveillance zone with a five-kilometre radius was drawn



around the suspected farm of origin. Although no animals on the farm in Oudomxay tested positive, on 1 September a second outbreak with very low daily mortality (i.e. 2 percent) was reported in one flock originating from the same farm. In February 2008 there were already some rumours of HPAI activity in southwestern China (i.e. Yunnan province) connected to an outbreak in Laung Namtha Province in the north of Lao People's Democratic Republic.

During April and May 2008, the **Republic of Korea** experienced its worst series of H5N1 HPAI outbreaks to date, with 34 outbreaks throughout the country. All but one of these outbreaks occurred in commercial poultry. Before May, the last reported outbreak had occurred in June 2006. More than five million chickens and ducks were depopulated.

The Government of the Islamic Republic of **Pakistan** reported seven HPAI outbreaks in 2008, the most recent on 19 June in a commercial poultry farm in the country's northwest. Since no further outbreaks have reportedly occurred, Pakistan declared itself free of HPAI with effect from 22 September.

In **Thailand**, after six months with no reported outbreaks, a new incursion of H5N1 in January affected native chickens in Pichit and a commercial farm in Nakhon Sawan. No additional outbreaks have been reported since that time.

HPAI is endemic in **Viet Nam**, and the Government has regularly reported outbreaks of H5N1 in poultry affecting mainly ducks. The veterinary authorities have been implementing a country-wide vaccination programme. Under-reporting remains a major issue; only a small percentage of outbreaks are actually detected and reported. Five fatal human cases of H5N1 infection have been reported since January 2008.

## The Middle East

No outbreaks have been reported in the Middle East for the last six months. The Government of the Kingdom of **Saudi Arabia** reported its last outbreaks in poultry in January 2008.

## Europe

The most recent HPAI outbreak in Europe was reported on 8 April 2008 in the **Russian Federation**. The **United Kingdom** experienced an outbreak between late December 2007 and 29 February 2008 in a swannery in Dorset, which affected several mute swans and one Canada goose. In **Switzerland**, a common pochard (*Aythya ferina*), which was sampled in the frame of the national programme for HPAI, tested positive in February. The Autonomous Republic of Crimea in **Ukraine** also reported outbreaks in poultry and cases in wild birds in January and February.

From January to March 2008, **Turkey** experienced seven outbreaks in backyard chickens at different locations along the Black Sea coast and inland in European Turkey. Most outbreaks were attributed to contact with infected wild birds (i.e. through hunting and subsequent exposure of backyard poultry to the wild bird carcasses). One H5N1 positive moribund buzzard (*Buteo buteo*), which was collected on 5 March 2008 from the wetlands adjacent to one of the outbreak sites, supported this theory. The buzzard demonstrated that the virus had persisted – most likely by circulating in one or more wild birds – for 3–4 weeks after the domestic poultry surrounding the outbreak site were depopulated.

## **Global situation**

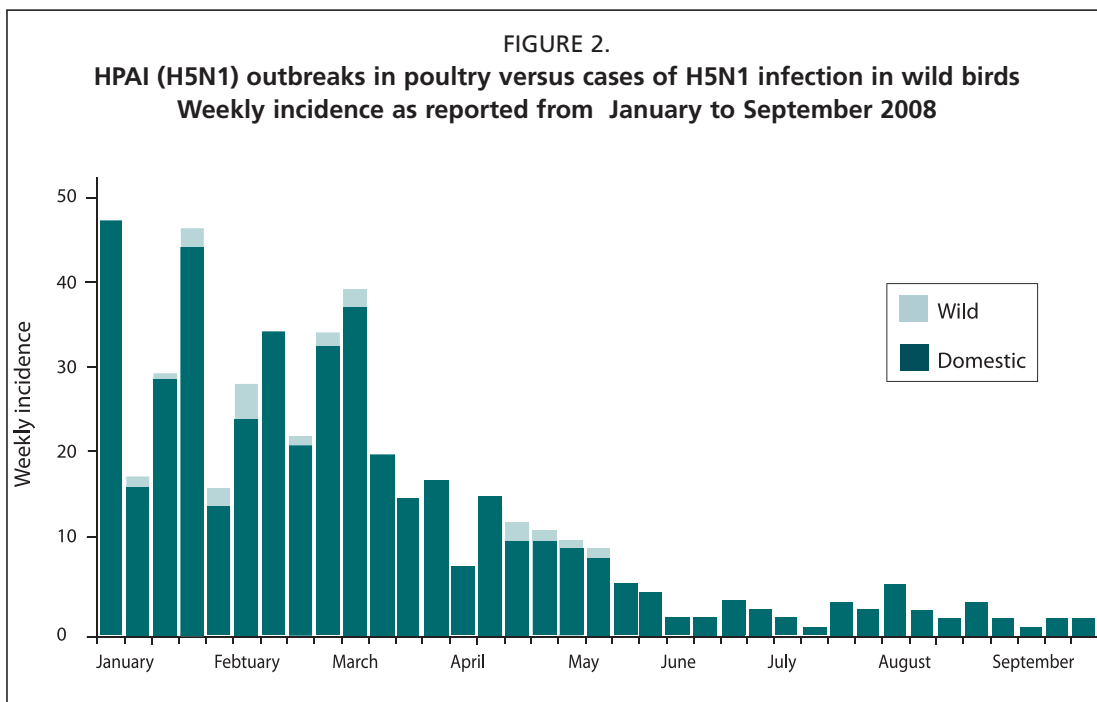
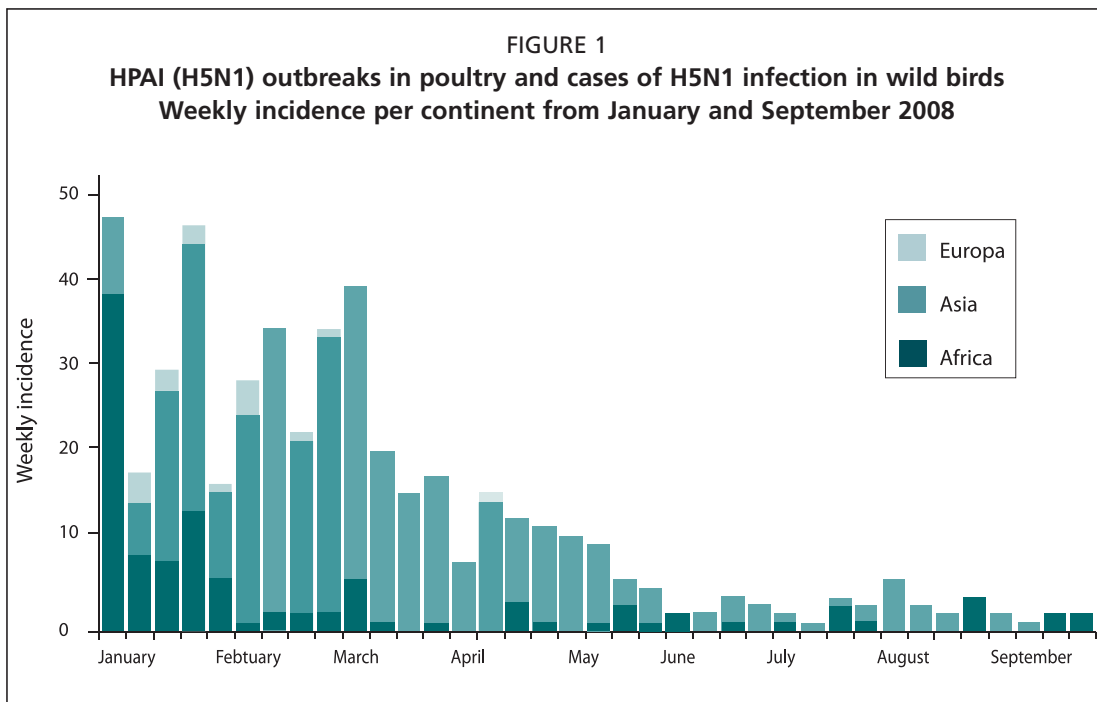
In light of the number of outbreaks reported worldwide, the overall, global HPAI situation can be considered to have improved substantially over the course of the first half of 2008. Nevertheless, H5N1 HPAI endemic countries continue to report outbreaks (i.e. Egypt, China, Indonesia and Viet Nam). Other areas (i.e. India, Nigeria, Pakistan, Lao People's Democratic Republic, and Togo) continue to experience reoccurring infection and a previously long-standing, HPAI-free area (i.e. China, Hong Kong SAR) has detected its first infection in five years. These events point to the need for continued international attention to the HPAI threat.

Although disease awareness has improved, HPAI outbreaks and cases are still underestimated and underreported in many countries because of limitations in national disease surveillance systems. These limitations may affect considerably the shape of the distribution of outbreaks by region. The variability and sensitivity in space and time of HPAI surveillance systems makes it difficult to draw accurate conclusions on the results and performance of countries affected in their fight against HPAI type H5N1.

## **THE "ONE WORLD, ONE HEALTH" STRATEGY**

Since the Government of the Socialist Republic of Viet Nam first reported HPAI in December 2003, FAO has taken a lead role together with OIE and WHO in providing international technical support to facilitate the coordination of global HPAI control. This coordinated effort has provided the platform for animal and public health sectors to work together in seeking common solutions to the avian influenza threat.

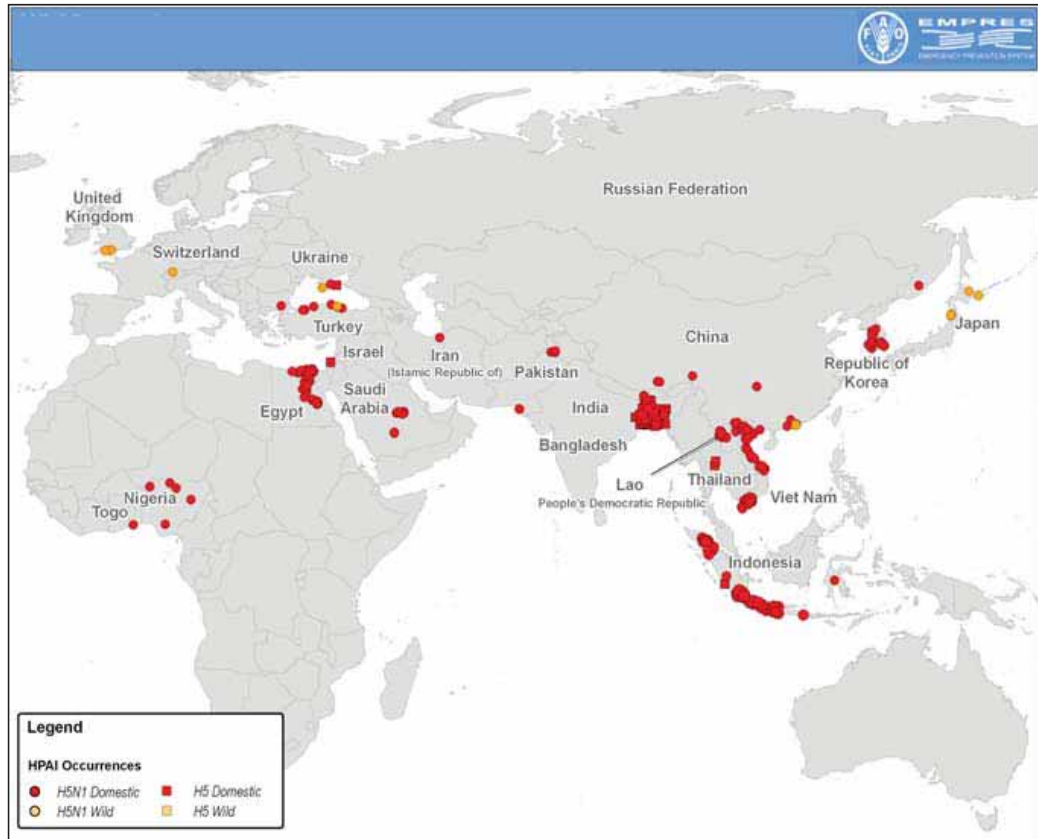
Within this context, a global strategy was developed in response to the recommendation of the December 2007 New Delhi International Ministerial Conference that Emerging Infectious Diseases (EIDs) be addressed while continuing the control of HPAI. FAO, OIE, WHO and UNICEF in collaboration with the World Bank developed this global strategy for managing risks of infectious diseases at the animal-human-ecosystems interface. The strategy: (i) identifies the major drivers for the emergence, spread and persistence of EIDs; (ii) defines coping options; and (iii) builds on the successes of and lessons from the H5N1 HPAI experience. This strategy and its implementation have been planned for discussion at the Sharm el Sheikh International Ministerial Conference in October 2008. In line with the principles of One World One Health, this global strategy demonstrates the enhancement and sustainability of the animal and human health collaboration that was initiated by the current avian and human influenza crisis.



<sup>3</sup> Data from the Participatory Disease Surveillance in Indonesia are not included

<sup>4</sup> Data from the Participatory Disease Surveillance in Indonesia are not included

**FIGURE 3**  
**HPAI update: outbreaks reported in poultry and cases in wild birds**  
**Situation from 26 March to 26 September 2008**



## PART 2

# Situation assessment and progress made

FAO technical expertise and operational capacity are being utilized to prevent and combat HPAI at all levels. This section provides an overview of the achievements in implementing the Global Programme with progress made in Government capacities during the reporting period from January - September 2008.

### SURVEY

To assess national capacities to prevent and control HPAI and monitor progress made, 54 representative countries, where FAO is implementing projects and programmes, were surveyed. Countries were selected according to their fluid epidemiological situations (mainly infected, newly infected or at risk countries) and/or to the importance of the FAO HPAI portfolio in the country. Latin America and Caribbean countries are therefore not included in the survey. The list of countries surveyed is in annex 3. Out of the 54 surveyed countries, 20 where outbreaks were reported, were assessed to specifically measure the improvement of their capacity during the reporting period from January to September. The survey was completed by FAO staffs positioned in the countries and regional offices using a questionnaire specifically designed for the survey. Data and information collected from the field were analysed against the following control capacities:

- Planning and Preparedness
- Surveillance in poultry and wildlife
- Laboratory capacities
- Response, including vaccination and compensation
- Biosecurity
- Coordination (intersectoral and cross border)

Communication of appropriate disease prevention and control strategies was assessed as a cross-cutting component of FAO's work.

The results of the survey were complemented with data and information obtained through project monitoring and regular reporting on HPAI activities under each component of the Global Programme. Also, case studies and illustrative examples contributed to highlight specific events and activities in infected and at high risk countries.

Results presented in the following section should be read as a preliminary assessment of overall government capacities to prevent and control HPAI. A more comprehensive assessment against the objectives and outputs set in the current Global Programme (2006-2008) is scheduled to take place in 2009.

## OPERATIONAL ASSISTANCE TO COUNTRIES

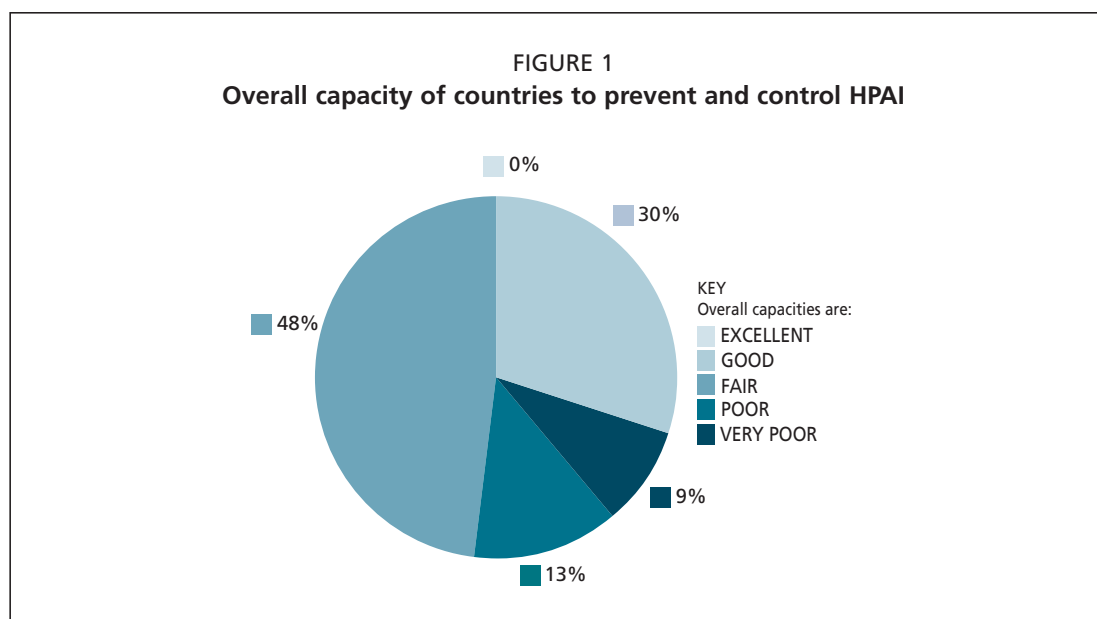
Since the beginning of the crisis in early 2004, FAO has been implementing a total of 145 projects benefiting more than 130 countries, with 90 projects still on-going of which 56 percent at country level, 34 percent at regional and 10 percent at global level (Table 1). While the earlier projects (2004) were planned over a maximum of eighteen months to respond to the emergency of the crisis in Asia, most of the on-going projects ensure a longer term assistance with funding up to 2011.

TABLE 1  
FAO on-going projects

	Sub-Saharan Africa	North Africa and Middle East	South, South-East and East Asia	Central Asia	Eastern Europe and the Caucasus	Latin America and Caribbean	Total
Global							9
Regional	11	4	8	3	1	4	31
National	15	4	23	5	3	0	50
<b>TOTAL</b>	<b>26</b>	<b>8</b>	<b>31</b>	<b>8</b>	<b>4</b>	<b>4</b>	<b>90</b>

## OVERALL CAPACITIES

Overall capacities to prevent and control HPAI in the 54 countries were ranked from very poor to excellent capacity with 78 percent of the countries surveyed were found either with fair or good capacity (Figure 1). Strong lobbying and guidance from the international technical agencies (FAO, OIE, WHO) have raised awareness in most countries which, in turn, have developed political willingness and dedicated resources to combat the disease. Data from the survey also show that the situation over the past 9 months (January to September) is evolving satisfactorily for 57 percent of the 20 countries where outbreaks were reported. For the others the situation remains unchanged during the reporting period.

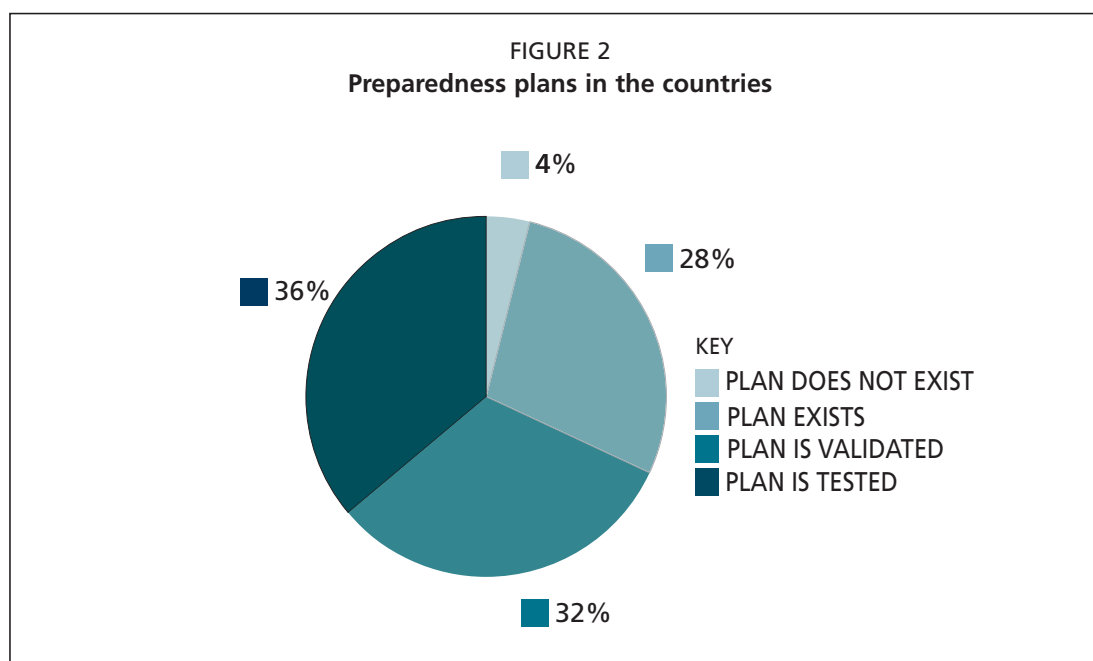


In spite of this progress, there are still significant gaps in knowledge of factors that are critical for the success of global HPAI control. In fact, about 22 percent of the countries infected or at-risk of infection still have inadequate animal health systems to mount effective prevention and control programmes. Lack of political willingness and resources are the main factors hampering the effective implementation of national plans against HPAI.

## PLANNING AND PREPAREDNESS

Of the 54 countries surveyed, the large majority (96 percent) have a preparedness plan dedicated to avian influenza, demonstrating that high attention has been given to the issue and awareness-raising has been successful almost in all countries (both infected and at risk countries). Most of the plans have been drawn up in compliance with the FAO/OIE Global Strategy and 95 percent of these plans integrate animal and human aspects for the prevention and control of HPAI. Simulation exercises are practiced in 36 percent of the countries and the preparedness plans have been updated after desktop review.

Only a few plans have been developed in consultation with the private sector. One major obstacle in the formulation of preparedness plans is the lack of poultry censuses and farm registration. In the absence of such information, the surveillance or response strategies are difficult to plan precisely. The absence of official validation of plans (plans have been validated in 32 percent of the cases) has been reported as a major constraint to their enforcement and financing. Transborder simulation exercises were never reported, although it is important to test the reaction of and coordination with neighbouring countries in the case of outbreaks on bordering areas. Some regional organisations have developed sub-regional preparedness plans, but with limited country alignment.



### Main achievements

- **Simulation exercises** - A methodology has been developed for desktop simulation for avian influenza in human and animal populations especially addressing communi-

cation, coordination and chain of command between the different sectors involved. Following the joint FAO/WHO meeting held in April 2006 in Ankara, desktop simulation exercises for Eastern Europe and Central Asia were implemented (Armenia, Albania, Azerbaijan and the Balkan region) (see Text Box 1). Simulation exercises are also being organized in African countries (see Text Box 2).

- **Integrated National Action Plans (INAPs)** - Eight ALive INAPs have been completed by experts from FAO, OIE, WHO and IBAR (Burkina Faso, Eritrea, Guinea, Lesotho, Madagascar, Namibia, Niger and Senegal). This adds up to the 8 plans prepared in 2007 (Benin, Liberia, Mauritania, Mozambique, Sierra Leone, Sudan, Togo and Uganda). Also donors' workshops (final step of INAP process) have taken place in Uganda, Liberia, Lesotho and Madagascar to seek support and funding for country INAPs. This process has not yet been completed, but it has allowed countries to identify gaps in their capacity to respond to HPAI. Significant investments are needed to support and implement INAPs.

### Remaining gaps and the way forward

Preparedness remains a strategic priority at all levels for the next phase of the Global Programme. FAO will pursue its efforts to:

- help design or review national preparedness plans following the integrated approach defined during the Beijing conference in January 2006;
- help test and review the plans tested through the simulation exercises in the countries;
- intensify the assistance to implement preparedness transborder activities promoting integration of country plans with sub-regional preparedness plans.



## TEXT BOX 1

**FAO/WHO tabletop exercises in the Eurasian region**

FAO jointly with WHO and with the financial support of USAID has developed tabletop simulation exercises for avian influenza in animal and human populations. The exercises so far have been held in Armenia (2007), Albania (2008) and Azerbaijan (2008). The purpose of these exercises was to bring together the different sectors involved in the response to an outbreak of highly pathogenic avian influenza (HPAI) and specifically identify the interoperability of the national preparedness plans, the strength and weaknesses related to the coordination, cooperation and communication mechanisms described in their respective contingency plans or actually in place.

The exercises over a two day period brought together between 40-60 participants from the different sectors and mainly animal, human health, wildlife, finance, emergency, communication, private sector, etc. In each of the exercises there were also a number of observers originating from other organizations present in the country or observers from neighboring countries. The exercise was divided in a number of sessions. In the first session the scenario was generally introduced through the provision of a video footage and written material as well as a number of guiding questions. During the first session outbreaks were suspected and subsequently confirmed in poultry. Gradually the scenario also contained human cases which required especially the close cooperation between animal and human health services. Furthermore the scenario required inputs also from other sectors. The groups were composed of 10-13 participants and group sessions were followed by plenary presentations and discussions. The scenario in all cases had previously been adapted to the realities prevailing in the target country and participants had received the contingency plans beforehand. The exercise also contained mock press or donor conferences. The three exercises have been conducted in the national language with simultaneous translation into English during the plenary sessions.

Overall the participants were not familiar with this kind of simulation exercises but they expressed their appreciation and the opportunity to interact closely with the other sectors.

In the countries the need for field simulations were expressed. It could be looked into combining the tabletop and field exercises as besides enhancing the coordination and communication mechanisms also provide the opportunity for hands-on capacity building.

Each exercise was carefully evaluated and the lessons learned contributed to improving the exercise methodology. The outcome of the tabletop exercises, especially the identified gaps and recommendations were discussed with the authorities and integrated into an activity plan which in a follow-up meeting in each of the countries was presented to the donor community for their further support to enhance the countries' preparedness to face outbreaks of avian influenza in animal as well as in human populations

## TEXT BOX 2

**FAO's tabletop simulation exercise for highly pathogenic avian influenza in Zambia**

As part of USAID supported project (OSRO/RAF719/USA) FAO implemented a tabletop exercise on the 4-5 September in Lusaka, Zambia. The exercise was attended by 24 participants from the veterinary, human health and communication sectors. In addition, participants from the neighboring countries (Malawi, Mozambique and Zimbabwe) also attended. The purpose of the exercise was to simulate an outbreak of highly pathogenic avian influenza in a rural area in Zambia and to test the National Response Plan. Special attention was paid to the coordination mechanisms and the cooperation and communication between the human and animal health sectors. A session has also been dedicated to address cross border coordination and communication by simulating outbreaks in border areas. The exercise in Zambia introduced the scenario through the performance of a sketch by a theater group. Furthermore, the use of a model/maquette enabled the visualization of the outbreak area and permitted the participants to delimit the different zones on the model for the implementation of the respective control measures.

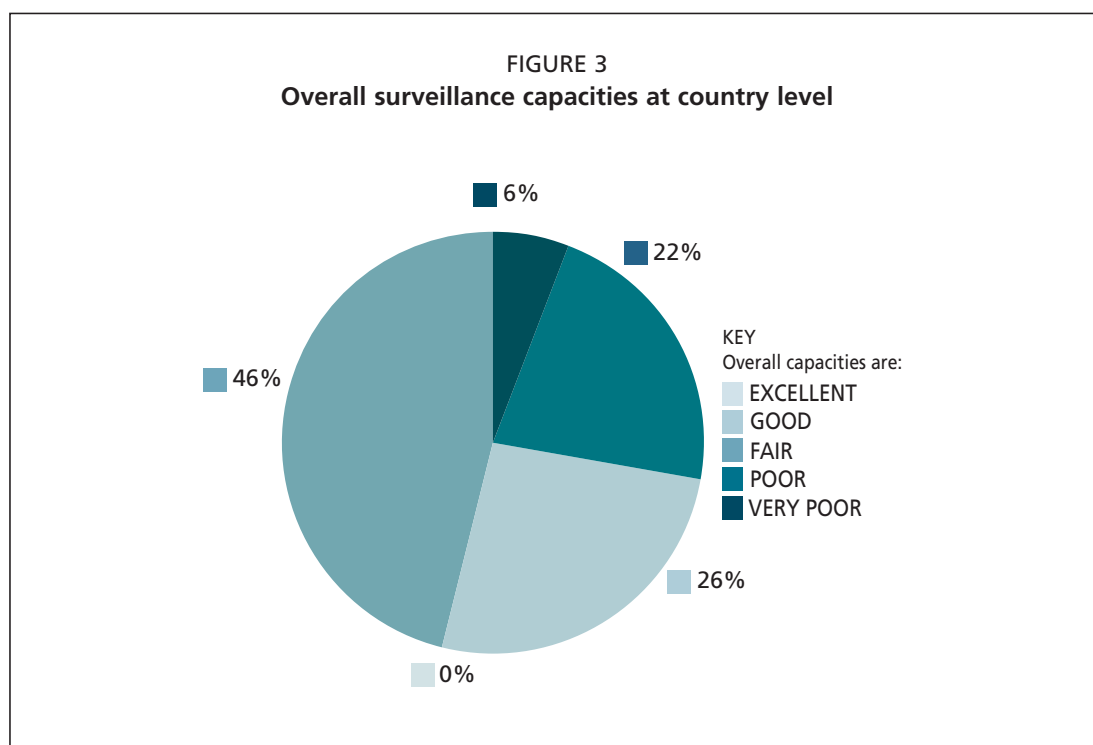
As there have so far been no outbreaks of highly pathogenic avian influenza in the Southern African Region it is difficult to maintain the interest of the authorities as well as of technical personnel for this disease. Nevertheless, the persons that participated in the exercise showed their commitment and interest. The outcome of the tabletop exercise clearly called for the revision of the National Response Plan as especially specific gaps in the operability of this plan were identified during the exercise. Overall there is a gap for the allocation of human and financial resources and a need to also involve the private sector in the development of the national plans. Prior to avian influenza most countries hardly had any National Response Plans for animal diseases in place. Moreover, addressing avian influenza in a multisectoral manner paves the way to address other zoonotic diseases. This is especially important in view of the emerging infectious diseases and the urgent need for countries to become prepared.

## SURVEILLANCE CAPACITIES

Country surveillance capacities have significantly improved in some countries. Of the total countries surveyed 72 percent were found with fair to good surveillance capacity with functioning systems in place. Situation remains unsatisfactory in 28 percent of the countries (Figure 3).

Surveillance is the area where progress achieved over the past 9 months has been most substantial.

In spite of this progress in surveillance capacities countries still lack well-defined surveillance plans combining passive and active surveillance both in domestic poultry and wildlife. Very few countries have elaborated risk-based surveillance plans. More epidemiological studies are needed to support such risk analyses. Surveillance at borders is one of the weakest points: quarantine measures are not implemented and food of poultry origin is not tested.



### Main achievements

- **Direct assistance to countries** - FAO is reinforcing HPAI surveillance capacities in more than 80 percent of the countries targeted by the Global Programme through training, procurement of data management, equipment and establishing field surveillance teams. FAO is also supporting countries implementing TADinfo, the FAO database which helps in the report and analysis of animal health national data. Surveillance in domestic poultry has been a key component of FAO Programme: 87 percent of national projects have domestic poultry surveillance activities. Surveillance in wild birds has been implemented only recently and results are still to come.

- **Reinforcement of countries epidemiological skills and disease surveillance** through training technical support to national surveillance teams to improve the quality of disease surveillance. GLEWS has provided technical assistance and training to Egypt on epidemiological data collection, analysis and management along with the local veterinary services and in collaboration with international research Institutes. The results of the epidemiological studies showed that the trade, the production chain, including abattoirs, and the agricultural practices (cultivated areas are more likely to harbour the virus) play a key role in the presence/spread of the virus. No evidence of the role of wild birds in HPAI outbreaks has been demonstrated in these studies.
- **The FAO subregional epidemiology networks** established in Asia, Africa and the Middle East continue to support activities at regional and country level through (i) developing surveillance tools for coordinated surveillance, (ii) developing evaluation and monitoring tools for national epidemiology systems, (iii) promoting information and knowledge sharing and (iv) support for epidemiological vigilance in the region.
- **Elaboration of regional and global epidemiological patterns for HPAI** through global and regional analysis of HPAI H5N1 outbreaks both spatial and temporal.
- **Risk factors assessment** in some of the affected countries (Burkina Faso, Cameroon, Cote D'Ivoire, Egypt, Nigeria and Sudan); and analytic and statistical studies to predict areas of high risk.
- **Guide for epidemiology risk-analysis and value chain** - The spread and maintenance of animal diseases is influenced by the movement of animals, livestock products and people within the livestock sector. The driving force of the movements relates to linking livestock systems with human populations that require livestock products through market systems. These livestock value chains involve the transfers of livestock and livestock products and money, and an understanding of how they operate and who controls, regulates and governs them is a method of assisting the epidemiological analysis of diseases and a tool to strategically intervene to prevent and control disease. FAO EMPRES and the ECTAD socio-economics unit are designing HPAI prevention and control measures. Studies have been completed in Egypt, East Africa, Indonesia and work is being finalized in West Africa, India, Bangladesh and SE Asia.
- **Determination of the spatial and temporal relationship between bird migration and HPAI** - Recommendations from the FAO/OIE International Scientific Conference on Avian Influenza and Wild Birds ([http://www.fao.org/avianflu/conferences/rome\\_avian/index\\_en.html](http://www.fao.org/avianflu/conferences/rome_avian/index_en.html)) hosted at FAO Rome (May 2006) included the need to improve the understanding of wild bird (both migratory and resident species) behaviour and migratory routes through the use of telemetry. To gain a better understanding of the potential for wild birds to spread virus, over 150 ARGOS or GPS transmitters were deployed on 15 species of birds categorized as high risk species for HPAI spread. These projects have been implemented in partnership with international, national and local partners at multiple sites in Mongolia, China, Kazakhstan, Malawi, Mali, and Nigeria and with additional projects to be implemented in India and Egypt. Data suggests that wild birds have been the source of disease spread and movement. However, the extent of their involvement in maintaining and translocating virus has yet to be determined, and understanding the spatial and temporal relationships between bird

migration and HPAI outbreaks has been one of the main objectives of a series of studies supported and implemented by the ECTAD Wildlife Disease Programme.

- **Role of Hunting in the Epidemiology of Highly Pathogenic Avian Influenza (H5N1) Outbreaks** - Turkey has experienced outbreaks of H5N1 HPAI in domestic poultry every year since October 2005 and six outbreaks occurred between January and February 2008, along the Black Sea coast. In response to these outbreaks, the CMC-AH and EMPRES fielded a rapid deployment team to conduct an epidemiological evaluation of the outbreaks in collaboration with the Chief Veterinary Officer (CVO) in Turkey and to determine the role that hunted or healthy wild birds may have played in the emergence of the virus. Results of the outbreak investigations closely link four of the six outbreaks to the introduction of infectious materials (feathers and viscera) from hunted wild birds (Coot and Mallard) introduced into back-yard poultry. At one outbreak site, national and international biologists captured and sampled 177 healthy free-ranging birds (mostly bridge species), collected samples from 43 dead birds (four hunted and 39 recovered by shoreline monitoring), and collected 75 fresh faecal samples for AI testing. Only a buzzard (*Buteo buteo*), found moribund and euthanized, was positive for H5N1 HPAI a month after the poultry outbreak had ended suggesting that virus most likely continued to be circulated in wild birds.
- **Surveillance costing and cost-effectiveness studies** are ongoing in Bangladesh, Viet Nam and Indonesia.

### Remaining gaps and the way forward

Support to surveillance activities has been strongly provided to the countries by FAO since the emergence of HPAI, with mostly satisfactory transfer of competencies at national level. However, additional assistance to countries should consist in building efficient animal health systems particularly through the identification of incentives for farmers to report diseases, reinforced public-private partnership, participatory approaches and veterinary services reinforcement.

Further support is still needed for:

- Capacity building at the national level, through targeted surveillance in specific risk areas (such as shared ecosystems between domestic and wild birds), species and at specific times, identified through risk analysis surveys;
- Better knowledge on the virus and the disease at the regional and global level, understanding the disease spread and dissemination mechanisms through migratory birds monitoring (telemetry), potential reservoir role of some species, and risk factors for virus exchange at the domestic / wild bird interface;
- Coordination and information sharing at the global level, through rumour tracking and disease intelligence to be continuously implemented (GLEWS).

## TEXT BOX 3

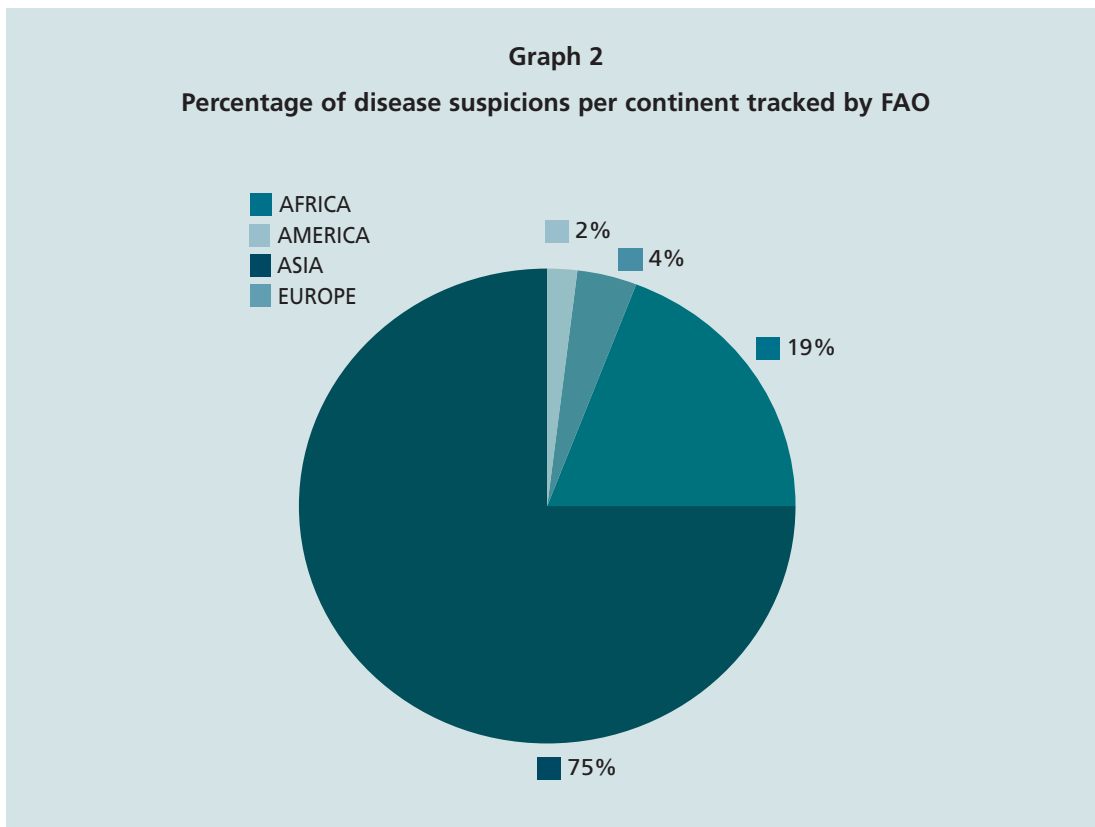
**GLEWS - HPAI Intelligence**

From September 2007 to August 2008, approximately 275 communications on HPAI have been shared among GLEWS partners, with an average of 26 per months (see graph 1 below). The highest number of suspicions were recorded in January and February. During the same period, 187 disease suspicions have been tracked by FAO with the majority of the suspicions tracked were events related to HPAI in Asia (see Graph 2). These suspicions were confirmed or denied through email exchanges between FAO officers and their country contacts, and through OIE reports and national government official communications published afterwards. In addition, staff involved in technical projects provides valuable information and data. In-countries networks with NGOs and media also largely contributed to capture rumours on disease occurrence.

GLEWS provides to the FAO OIE Crisis Management Centre Animal Health (CMC-AH) the information on main disease events and risk assessment, thus contributing to the FAO rapid response mechanism. WHO, OIE, and FAO encouraged the countries to be transparent in their reporting of significant events and to interact with WHO, FAO country representation and government counterparts (e.g. Ministries of Health and Agriculture, Veterinary Authorities, Food Safety Authorities).

**Graph 1**  
**Number of communications on HPAI From September 2007 to August**





TEXT BOX 4

**Working together**

**The Scientific Task Force on Avian Influenza and Wild Birds**

The Task Force was established by the UNEP Convention on Migratory Species (CMS) in close cooperation with the Agreement on the Conservation of African Eurasian Migratory Waterbirds (AEWA) in August 2005, following concerns about the role of migratory birds as potential vectors of highly pathogenic avian influenza (HPAI) virus subtype H5N1. The FAO, originally an observer of the Task Force, became a full member in March 2007, and in June 2007, the Emergency Centre for Transboundary Animal Diseases (ECTAD), Wildlife Disease Programme (FAO) was acknowledged for its commitment and dedication to understanding the role of wild birds in the spread of HPAI H5N1 and was invited to co-convene and co-coordinate the Task Force with UNEP/CMS.

The Task Force comprises representatives and observers from 14 international organisations, including four UN bodies, specialist non-governmental organisations, and individual experts and aims to obtain the best scientific advice on the conservation impact of the spread of HPAI H5N1, including assessing the potential role of migratory birds as vectors of the virus. It has issued advice on the root causes of the spread of this disease and has promoted the development of international early-warning systems.

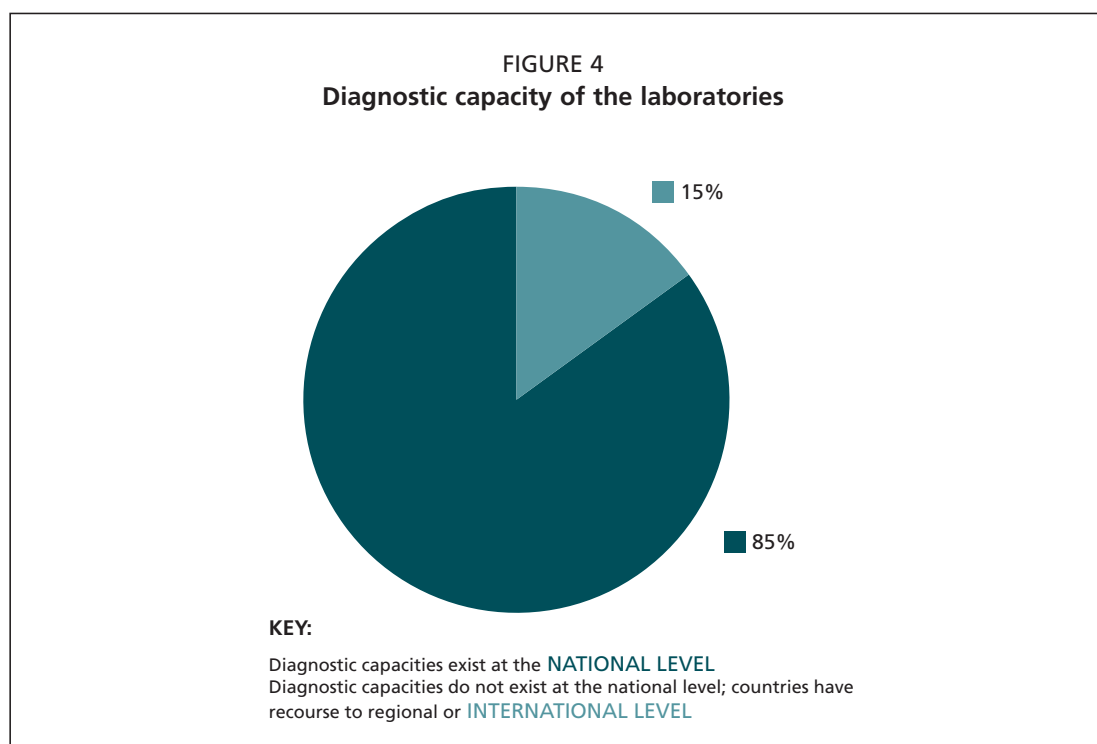


## LABORATORY CAPACITIES

Country laboratory capacity has been extensively reinforced and is currently satisfactory worldwide for basic HPAI identification. Results show that 85 percent of the countries interviewed have national diagnostic capacities and are able to perform rapid diagnostic tests to identify the influenza type A virus (Figure 4). Rapid diagnostic kits are available to conduct tests throughout the country and allow taking early measures by waiting confirmation tests. The majority of countries interviewed also have the capacities for serological testing for H5, H7 and H9 (through Hemagglutination inhibition and gel immunodiffusion tests). Many of them also have ELISA testing capabilities as well as are able to perform molecular tests (Real Time-Polymerase Chain Reaction RT-PCR) for identifying the H5 strain of influenza type A. Few countries (15 percent) still not have capacity at national level.

Analysis of data from 20 countries where outbreaks were reported shows that laboratory capacities have evolved satisfactorily only in 38 percent of the countries over the reporting period from January to September 2008.

In spite of progress made in this capacity there are remaining weaknesses. Many national laboratories that rely on external aid to function and are mostly unsustainable beyond the HPAI crisis. Few interviewed countries have the capacities to identify the virus by referenced labs, needed for official confirmation of the strain to the OIE. Additionally, countries experienced financial and technical difficulties to ship samples safely to reference laboratories.



### Main achievements

- **Direct assistance to countries** – The vast majority (83 percent) of HPAI national projects have activities aiming at strengthening laboratory capacities. Laboratory activities provided by FAO through OFFLU have also greatly improved the diagnostic capability



of national veterinary laboratories in many countries, significantly contributing to monitoring the course of HPAI and ensuring that the plans for disease control in infected countries, surveillance and preparedness in non-infected countries, are based on sound scientific knowledge. Laboratory support to laboratories has been achieved through:

**Training:** Most laboratories performing serological and molecular tests have received training and veterinary expertise through laboratory assessment missions. OFFLU assistance has been directed towards supporting key areas such as molecular epidemiological studies on virus isolates from infected countries; testing of samples from wild birds from non-infected countries with limited capacity for in-country testing; assisting with the training of personnel from national laboratories; assisting with the training of field staff for epidemiological surveillance and specimen collection; and providing advice for laboratory testing quality assurance. A Letter of Agreement has been signed with the Istituto Zooprofilattico Sperimentale delle Venezie (IZSve) (Padova, Italy) that includes testing of 400 specimens for confirmation from African and Middle Eastern countries, whole genome sequencing of 100 AI viruses and shipment, 22 weeks of training in IZSve for African laboratory staff, 35 days of expertise to African laboratories and proficiency tests for 26 countries.

**Functioning laboratory networks:** Countries also receive support from the regional laboratory networks. In Africa, the West and Central Africa network has organized training sessions in international reference or regional laboratories (5 sessions, 2 already covered), local training in many countries (not started), provision of reagents (3 tenders for 3 labs), proficiency tests, support to the two regional laboratories (Senegal and Nigeria), annual Network Coordination meeting (November 2008, RAHC, Bamako) to review network life and proficiency tests results.

**Provision of equipment and supplies:** Many central and provincial laboratories in countries covered by the Global programme have been provided with equipments and reagents through FAO projects and with the active assistance from several international reference laboratories of the OFFLU Network on HPAI. FAO has also storage of basic laboratory items, such as sampling kits, PCR reagents, serology reagents, IATA shipping boxes. During the reporting period, shipment of 2-3 laboratory items or kits have been shipped by pouch to about 25 countries, many of which in Africa.

**Logistical support for samples shipment:** To ensure accurate diagnosis of HPAI outbreaks and virus strain monitoring, FAO provides logistical assistance to Member Nations for shipping samples or isolates to OIE/FAO reference laboratories. FAO has contracted a shipping company to offer a door-to-door service, and coordinates the links among dispatching laboratories, the shipping company and receiving reference laboratories. A specific email address ([empres-shipping-service@fao.org](mailto:empres-shipping-service@fao.org)) has been set up to receive requests from member countries and support them. In the reporting period, six shipments have been covered by FAO between the following countries: Bangladesh to UK (1), Egypt to Italy (1), Turkey to Italy (2), USA to Australia (2) (reference material made from Indonesian viruses).

**Proficiency testing in Africa:** FAO has requested the OIE/FAO international reference laboratory in Italy (IZSVe) to organize proficiency tests for 24 African countries in 2008: Algeria, Morocco, Tunisia, , Saudi Arabia, Iran, Jordan, Egypt, Burkina Faso, Benin, Cameroon, Chad, Central Africa Republic, Cote d'Ivoire, Democratic Republic of Congo, Ghana, Guinea Conakry Ethiopia, Kenya, South Africa, Sudan, Mali, Niger, Nigeria, Senegal. These tests are aimed at assessing the capacity of laboratories to diagnose HPAI virus by virology and/or serology testing. Final results are expected will be presented at the Annual Meetings of the four African Laboratory Networks (North, West and Central, East, South).

- **Improved Knowledge on the virus and circulating strains** - OFFLU network has been key in the characterisation of virus isolates from infected countries and laboratory testing of samples from wild birds, particularly in the countries with limited capacity. A project aimed at evaluating the appropriateness of poultry vaccine antigens used in Indonesia is being implemented by FAO in collaboration with of OFFLU. This project allows the coordination of the international reference laboratories in the evaluation and development of a new technique (antigenic cartography) and capacity building on sequence analysis and antigenic cartography in Indonesia. It has also encouraged the cooperation with Indonesia by promoting information sharing experiences. Similar investigations are planned and will be soon carried out in Egypt. OFFLU is also promoting the use newly-developed Unified Nomenclature System for HPAI Viruses based on Hemagglutination (HA) gene phylogeny (posted on the WHO website) and the exchange of strains and information between WHO and OFFLU veterinary laboratories.

### Remaining gaps and the way forward

Provision of laboratory equipment and materials (rapid diagnostic tests, PCR, etc.) has been largely ensured through FAO projects. Efforts regarding capacity building at national level, including the provision of equipment, remain fully relevant and should continue during the next phase. FAO national activities should progressively shift from the provision of hard to soft investments.

At the regional level, development of laboratory regional networks and emergence of regional reference laboratories in line with OIE guidelines should constitute a priority. Establishment of functional regional laboratory networks should help harmonize practices within a region, implement capacity programs and provide country assistance as needed.

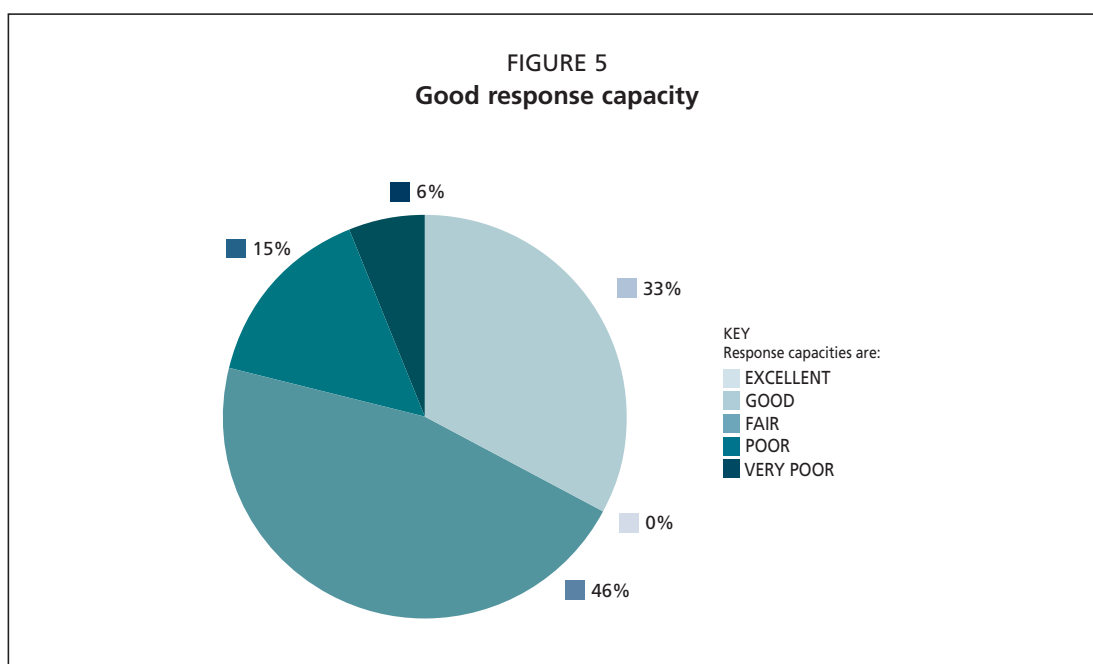
OFFLU will be the main tool to implement these activities and its sustainability should therefore be ensured financially.

### RESPONSE CAPACITIES

Country response capacities to quickly control the disease are continuously improving in the majority of the countries surveyed. In 79 percent of the countries, FAO recorded fair to good response capacity (Figure 5). Most country response plans have adopted the FAO/OIE Global Strategy for the Prevention and Control of HPAI as the basis for their own national strategy. The majority of the countries employ stamping out measures (i.e. movement restriction, depopulation, disinfection and disposal) more than vaccination. As part of their

rapid response, all countries implement conservative measures (i.e. quarantine, movement restriction and preventive depopulation with compensation) in cases of 'legitimate suspicion' (i.e. rapid diagnostic positive associated with clinical diagnostic).

FAO found the link between reporting to the veterinary services and triggered response acceptable. However, reporting from the field to competent authorities remains a constraint due to insufficient surveillance mechanisms.



## Main achievements

- Rapid deployment response in countries** - FAO response activities are provided primarily through rapid deployment missions deployed by the CMC-AH. In addition, the majority of national projects (i.e. 54 percent) implemented under the Global Programme also support response through components consisting generally of training and simulation exercises. During the reporting period, the CMC-AH deployed a total of six missions in support of countries responding to critical situations involving HPAI or other TADs. FAO has also placed the CMC-AH on alert on several occasions, during which time the CMC-AH has advised FAO in-country staff without deploying its own teams. This was the case during the most recent HPAI outbreaks in India, Iran and Pakistan. The results of all completed missions were shared in 'real time' with the wider FAO HPAI/EMPRES programme, as well as with the relevant FAO Representatives. Each step of these missions is monitored and tracked using four important reporting mechanisms: daily situation reports, handover reports, debriefings and mission reports. CMC-AH can also receive requests to assess the countries level of preparedness with regard to HPAI (or other TADs).
- Country response impact assessment studies** - Following large scale depopulation through culling measures, several countries have experienced supply constraints and increasing poultry product prices. These impacts have been particularly severe in the supply of eggs in Egypt and more recently in Bangladesh which create negative

impacts on urban-based consumers, most of which are poor people in mega-cities. Livelihoods impact studies finalized by the ECTAD socio-economics unit in Egypt, East Africa, Cambodia, the Lao People's Democratic Republic and Indonesia show that, when deciding on a response, depopulation has to be compared to the cost of vaccination. The socio-economic unit is developing a costing model for the depopulation, disposal and disinfection process, building on the standard operating procedures (SOPs) being developed in Asia and Africa.

#### CMC-AH rapid missions: January – September 2008

<i>Dates</i>	<i>Country</i>	<i>Disease</i>	<i>Focus</i>
18 February – 12 March	Turkey	HPAI	Investigation of the role of wild birds (Box 5)
19 February – 3 March	Nepal	HPAI	Assessment and outbreak preparedness
4 April – 10 June	Nepal	HPAI	Technical assistance and follow-up
29 April – 14 May	Madagascar	RVF	Assessment and response
2–19 June	Madagascar	RVF	Technical assistance and follow-up
12–21 August	Morocco	PPR	Assessment and response

#### Remaining gaps and the way forward

FAO is working to continue assisting countries through rapid deployment missions, which provide strategic advice on the best way to tackle outbreaks or suspicions to help stop diseases before they spread. In support of the CMC-AH as a lead facility for response, FAO is seeking a core donor base to maintain the CMC-AH's operational capacity for deployment whenever and wherever the need arises. In the long term and with the continued, significant commitment of member countries, FAO response activities should decrease in parallel with increased surveillance capacities at the national level, allowing early reporting and limited immediate response.

## TEXT BOX 5

**Role of Wild birds - Turkey**

When HPAI outbreaks in January 2008 were linked to wild water birds, the Government requested FAO's assistance for rapid sampling of wild birds in areas near the outbreaks. The CMC-AH deployed two wildlife experts and one epidemiologist to investigate the possible connection between wild birds and domestic outbreaks of HPAI.

Working in close collaboration with Turkish authorities and the Avian Influenza Preparedness and Response project team of the European Union, the mission team carried out simultaneous poultry outbreak investigations and wild bird census, capture and sampling activities.

Based on mission findings, the team recommended collaborative efforts to:

- develop literature on best practices for hunters and their families to prevent the spread of HPAI to poultry and wild birds and to safeguard human health;
- train ornithologists, hunters and hunting clubs and laboratory staff to increase their respective HPAI technical capacities and knowledge;
- work with national ornithologists, laboratories, hunting clubs and the Ministries of Agriculture and the Environment to review and modify the national contingency plan and ensure future outbreak responses including: (i) coordinated outbreak investigations; (ii) wild bird census and mortality monitoring activities; and (iii) wild bird sampling activities at outbreak sites or adjacent wetlands;
- facilitate a long-term wild bird monitoring and disease surveillance programme;
- implement census, monitoring, surveillance, habitat use and migration studies in multiple countries bordering the Black Sea to better understand the relationship between livestock and wildlife in the region as well as the role of ecology in wild bird movement along the Black Sea coast line.

## VACCINATION

Vaccination is used in a small number of countries and it is not always implemented and monitored appropriately. Few countries have opted for a vaccination strategy and 77% of the countries surveyed do not have a well defined vaccination strategy (Figure 6).

Experience shows that use of properly formulated vaccines and appropriate vaccination strategy can play a valuable role in HPAI control, particularly if the infection has become widespread in a country. Access to quality vaccines has improved through the recommendations from OIE and FAO. Diva vaccines are recommended to make the difference between infected and vaccinated animals; however such vaccines are rarely used.

Most countries are subsidizing 100 percent of the national vaccination campaigns (sectors 1 to 4)<sup>1</sup>. In some countries, only sector 4 vaccination is subsidized and commercial farmers (sectors 1 and 2) finance the vaccination of their flocks.

Vaccination strategies are not always well defined (duration of the campaign, targeted vaccination coverage, targeted species, etc.) and the exit vaccination strategy is rarely mentioned. The possibility that countries could face a deterioration of their epidemiological situation is rarely anticipated and therefore no countries are prepared to quickly shift to a vaccination strategy should it be needed. Extensive resources are needed to mount vaccination programs effectively, including post vaccination and virus circulation monitoring as well as development of an exit strategy. The availability of well-trained human resources is also a constraint to efficient vaccination implementation. The choice of the vaccination control strategy is generally not based on a risk analysis and cost-benefit analysis. Countries such as Viet Nam, willing to improve their vaccination control strategy are currently carrying out epidemiological and economical assessments.

### Main achievements

- **Direct assistance to countries** - FAO support to countries consists in the provision of technical advice to the governments (Box 6), the contribution to the implementation of vaccination campaigns particularly at the monitoring level, and the participation in vaccine efficacy trials or vaccination costing.
- **Vaccine efficacy trials** - FAO, through OFFLU, assists the countries in improving their vaccination strategies through the identification of circulating viruses (virus characterization and mapping of antigenic variants) and the selection of the fully adapted vaccines. Projects are implemented in Indonesia, Egypt and Viet Nam, where in particular, FAO also supports the country with efficacy trials.
- **Development of a vaccination costing model** – A vaccination costing model has been refined with a focus on Viet Nam, Indonesia and Egypt. In addition, a poultry

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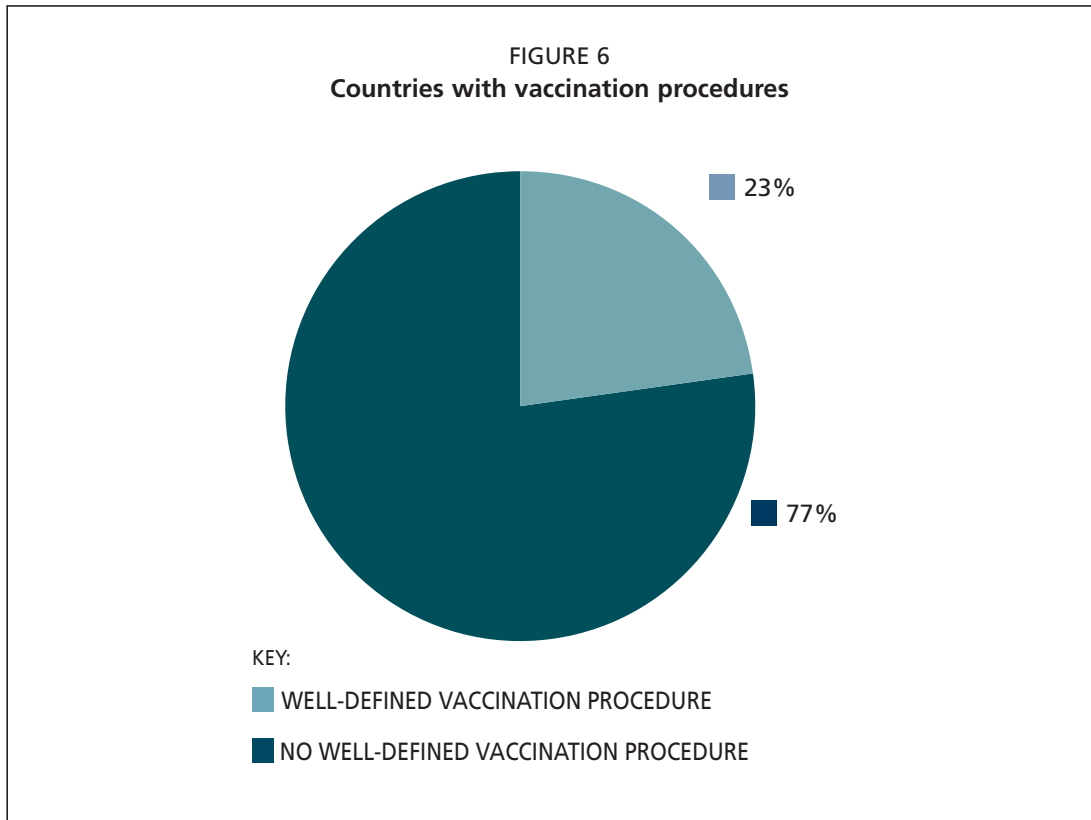
<sup>1</sup> **Sector 1** – Industrial integrated production with high level biosecurity and birds or products marketed commercially.

**Sector 2** – Commercial poultry production with moderate to high biosecurity and birds or products sold through slaughterhouses or live poultry markets.

**Sector 3** – Smallholder commercial poultry production including water fowl, generally with low biosecurity and birds or products usually sold through live bird markets.

**Sector 4** – Village or backyard production with minimal biosecurity and birds or products consumed locally. It is recognized that there are gradations between sectors.

population model has been developed, which combined with the cost model, provides practical tools to estimate cost-effectiveness of vaccination strategies. These models are becoming an important component of the OFFLU coordinated virus monitoring and vaccination strategy development project. A working group has been formed and discussion papers written and circulated.



### Remaining gaps and the way forward

Vaccination guidelines and tools are already available (Proceedings from the international conference on "Vaccination: a tool for the control of avian influenza" in March 2007 in Verona, Italy). Further studies are however needed on how to shift from a 100 percent subsidized to a cost-shared mechanism with the private sector. FAO support to countries in terms of vaccination should therefore concentrate on overall guidance on the best vaccination strategy to implement, taking into account the epidemiological situation, the Veterinary Services capacities and the poultry industry. Provision of vaccines through the development of vaccine bank in cooperation with OIE (and regional organization) could also be envisaged.

## TEXT BOX 6

**New AI strategy for Viet Nam  
(Strategic Review Meeting, Hanoi, 13-14 August)**

The Ministry of Agriculture and Rural Development (MARD) and the Partnership on Avian and Human Influenza (PAHI) reviewed the Strategy for Control and Prevention of Highly Pathogenic Avian Influenza in the Agriculture Sector. The meeting focused on the strategy for mass poultry vaccination, management of hatcheries and waterfowl production, in order to make recommendations to revise the strategy for the coming period, in line with the current disease situation and animal husbandry practices in the agriculture sector. Vietnam has achieved some significant successes in the fight against AI.

The main experiences drawn from the fight are: strong commitment and leadership from the Government at all levels, mass and targeted vaccination, strict control of poultry movement and awareness raising campaigns. During the meeting, FAO experts supported the need for MARD to consider sharing the cost of avian flu vaccine with producers in order to bring government support to a level that is sustainable in the long term. Public-private cost sharing will not only enable the governments at the central, provincial and district levels to have some budgetary reserves for supporting other key disease prevention and control interventions, but is also likely to bring about a sense of ownership and therefore stronger participation in the vaccination policy by all those involved in the poultry business. FAO also recommended that MARD consider changing from twice yearly mass vaccination campaigns, to those carried out throughout the year in each flock at the optimum age of birds. This will provide better protection against the disease. Furthermore, a strict record of vaccinations should be developed for all flocks, with evidence of vaccination being a requirement for poultry to be taken to live bird markets for sale. In addition to vaccination recommendations, long term measures are encouraged, including improvements to biosecurity of poultry farms and improved regulation of live bird markets. The large commercial farms already have a high level of vaccination and they already pay for their own vaccination, so it is the small commercial farms that we believe needs to be the focus and the most appropriate financing mechanism for that level is cost sharing. The five human cases that have occurred this year have been associated with people handling sick or dead poultry, generally in the village situation.

**COMPENSATION**

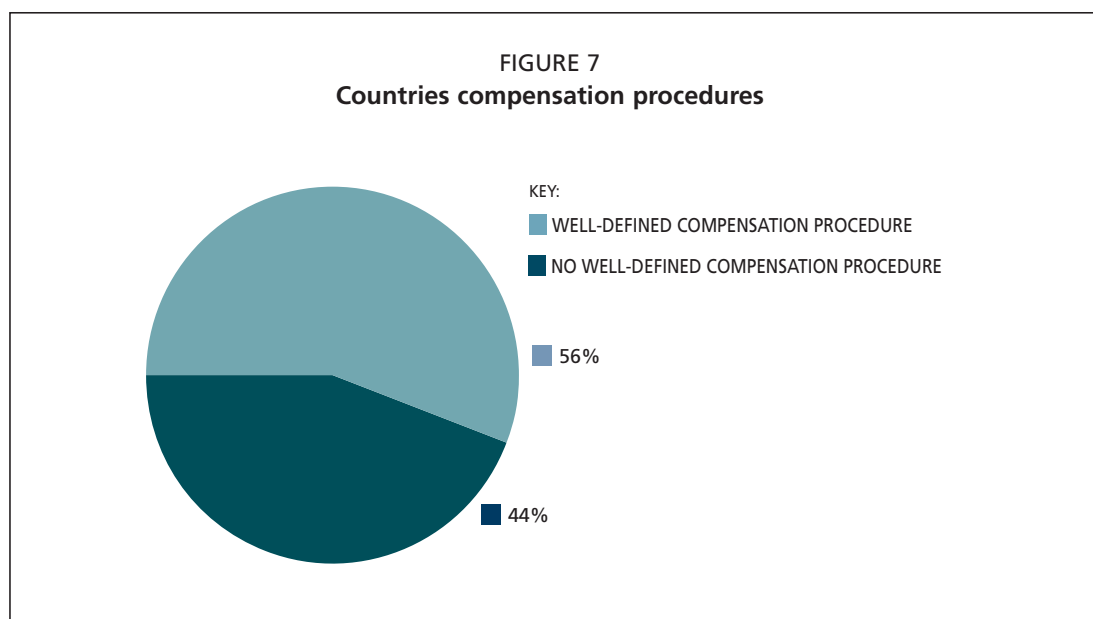
Compensation is widely implemented in the case of sanitary culling. 56 percent of the countries interviewed have a well-defined compensation strategy/scheme (Figure 7). Even in countries which have never experienced HPAI outbreaks, there is a well-defined compensation strategy to encourage early reporting from breeders and more easily accept culling measures when needed. The majority of backyard and small-scale production systems are compensated, while large-scale commercial farms may benefit in some cases, otherwise, they turn to their own insurance systems, which is not frequent but



encouraged. The compensation rate is generally based on the market price of the culled animal (estimated before the crisis) between 50 and 100 percent. However, reports in the last six months show that the compensation rate has usually increased and is sufficient. In all countries interviewed, compensation is provided in cases of preventive culling and suspicions are classified as positive results.

Only 14 percent of the 20 countries where outbreaks were reported have improved their situation in term of compensation over the reporting period. This is explained by the fact that compensation policies are already fairly good in a majority of countries (only Cambodia, Egypt and Sudan were declared unsatisfactory compensation wide) and also by the fact that compensation efforts have been previously produced (2005-2006), at the time when compensation guidelines were issued.

Many countries have reported a compensation delay of several months which is not sustainable for farmers, especially for small-scale / backyard farmers. Harmonized regional or sub-regional compensation rates were not reported. Compensation funds usually come from the national budget (emergency funds dedicated to all types of emergency); however, in some countries, compensation is paid through external aid which is not sustainable.



## Main achievements

- **Developing templates for compensation policy, legislation/ regulation and for an Operational Manual** - During the past 6 months, based on the experience accumulated in previous technical assistance missions, templates for Compensation Policy, Legislation/Regulation as well as a template for an Operational Manual on Compensation have been elaborated. Most countries do not have a legal framework to support compensation and therefore the government is not liable to pay compensation to farmers. Endorsed policy and decree or regulation can be implemented/enforced when needed. The operations manual is a step by step guide to implement compensation procedures. Policy decree and legislation as well as

operations manuals have been implemented in Armenia, are in process of elaboration in Palestine, they have been developed for Trinidad and Tobago as well as Peru and are awaiting government approval.

- **Elucidating the role of insurance schemes in HPAI** - Lately interest from countries has focused on the role of insurance schemes in HPAI and TADs control, especially in regions such as Latin America. Collaboration on this subject is ongoing with the Spanish Ministry of Agriculture's national agricultural insurance branch ENESA (Entidad Nacional de Seguros Agrarios). This is an area that has increasingly attracted attention especially in transition/middle income countries because their economic development allows for private insurance companies to offer their services in their national territories. Local insurers, as well as international re-insurers, are attracted because it is a new market. Technical assistance on risk modelling and setting up the policy scheme for poultry production, a highly specialized field, is therefore needed.
- **Developing communication on compensation** - The ECTAD socio-economics and communications teams are working closely to develop communication strategies on compensation and workshops have been organized (Tunis, Dakar and Ankara).
- **Support to national compensation policies design and implementation** - Culling has been one of the main HPAI control tools used for HPAI and can only be effectively implemented with consistent and fair compensation policies. The Socio-economics Unit has continued to support and develop the work on compensation policies with in-country activities in Egypt Gaza, West Bank Uganda, Togo, Armenia, Trinidad and Tobago, Peru and Panama.

### Remaining gaps and the way forward

Guidelines on compensation schemes and policies already exist. Additional guidelines and survey are needed to explore alternative options possibly involving the private sector in cost-sharing compensation schemes. In terms of assistance to countries, FAO will continue providing overall guidance on the best compensation scheme to implement. Compensation is a key activity to ensure and encourage early reporting. FAO should therefore continue assisting countries and working on evolving compensation options with a shift towards the private sector.

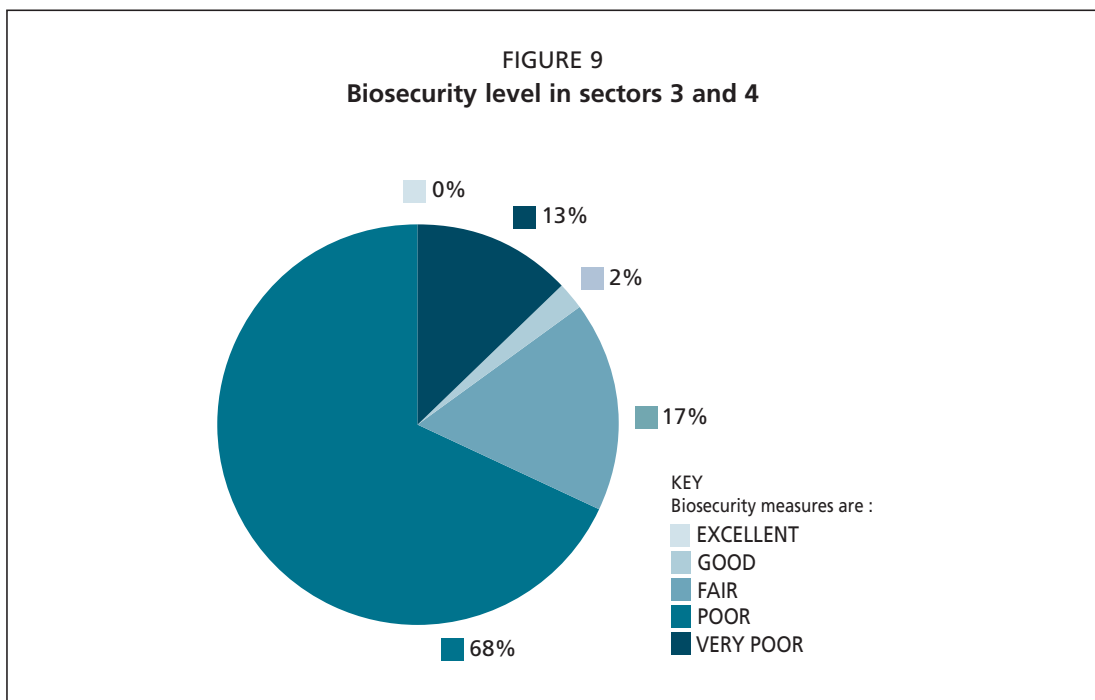
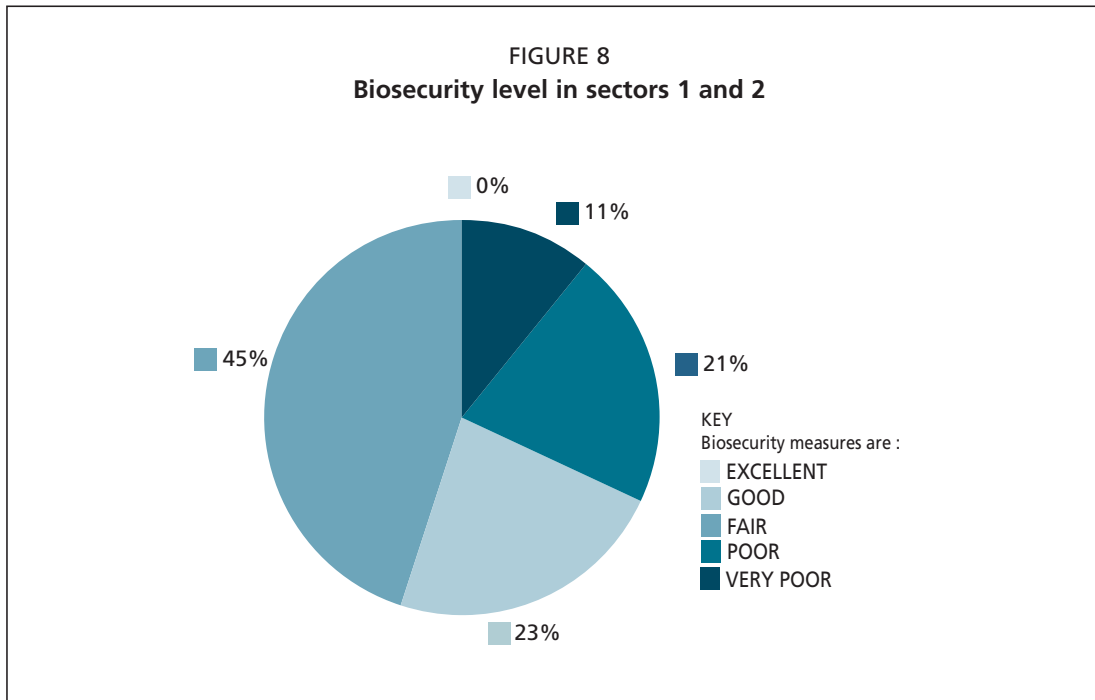
### BIOSECURITY LEVEL

Overall, country biosecurity measures in poultry production systems are poor with major discrepancy between Sector 1 (good) and Sector 4 (very poor). Biosecurity levels are generally fair to good in larger scale commercial production systems (Figures 8 and 9).

Out of the 20 countries where outbreaks were reported, 86 percent have seen an improvement of their biosecurity level (mainly in sectors 3 and 4), though it remains very low. This is due to the recent focus of technical agencies on poultry production factors and marketing systems as part of prevention and control of HPAI. Work has therefore focused on a better understanding of the functioning of the whole poultry sector at national levels, including poultry and poultry products value chains. This information is now available for many key countries and allows prioritization in implementation of biosecurity measures.

Small scale and backyard production systems have a very low biosecurity level (measures

largely non-existent) in all regions. In live-bird markets, slaughter houses and processing facilities, biosecurity levels are also poor and very few countries actually implement biosecurity measures. In most cases, such measures are not regulatory and therefore not enforceable. Most of the commercial sector is implementing biosecurity measures on a voluntary basis but farmers, especially small farmers, and small traders have limited incentives to implement them.



### Main achievements

- **Direct assistance to countries** - Over the past two years FAO has increased its assistance to improve farm biosecurity through awareness and targeted education. About 46% of FAO HPAI projects have a component specifically dedicated to farm biosecurity and related activities.
- **Elaboration of a policy document on biosecurity** - A task force was entrusted with the responsibility to develop a strategic document on biosecurity which will be presented at the Sharm el Seikh interministerial conference on HPAI in October 2008. This document builds on the conclusions and recommendations of the November 2007 international conference on "Poultry in the 21st Century". A work programme is being prepared for donor support to translate the strategic orientations in the biosecurity document into concrete actions and guidelines for improving biosecurity at all levels of the market chain.
- **Production of technical guidelines on husbandry methods for smallholders** - Technical guidelines on practical and affordable husbandry methods for smallholders, specific for the Eastern Africa context have been developed.
- **Development of smallholder friendly disease control policies** - A survey of all major live bird markets and with selected traders of poultry has been completed in Cambodia and a database established with the collected information. Characterization of poultry production systems is being carried out in Cambodia, Egypt and Uganda as a preparation for the development of smallholder friendly disease control policies.
- **Assessment of national biosecurity systems in place** - Within the last six months, four new national poultry sector reviews have been made available (Morocco, Burkina Faso, Kenya, Uganda) and detailed reviews of the poultry sector are in completion for Bangladesh, Tunisia, Middle East, North Africa and South East Asia.

### Remaining gaps and the way forward

Biosecurity is a key activity in terms of preparedness and response, and gaps at the country level are immense, especially in sectors 3 and 4. There are currently very few examples of behavioural change on a large scale, that can be related to better incentives for poultry small scale producers and traders. A lot more work is still needed in this area, requiring a multisectoral approach involving animal health and production specialists as well as communication and socio-economic specialists. New incentives for producers and traders to invest in biosecurity measures remain to be explored, such as linking compensation rates to level of biosecurity implemented (currently being tested). Development of adequate communication tools focusing on behaviour change rather than awareness only, are also needed.

Support for the implementation of biosecurity measures is a medium- to long-term objective and FAO should therefore allocate an important budget for these activities at national level, to continue assessing national measures in place and support this implementation (including compartmentalization if ever needed), in line with the guidelines on biosecurity and OIE recommendations on compartmentalization, both recently issued.

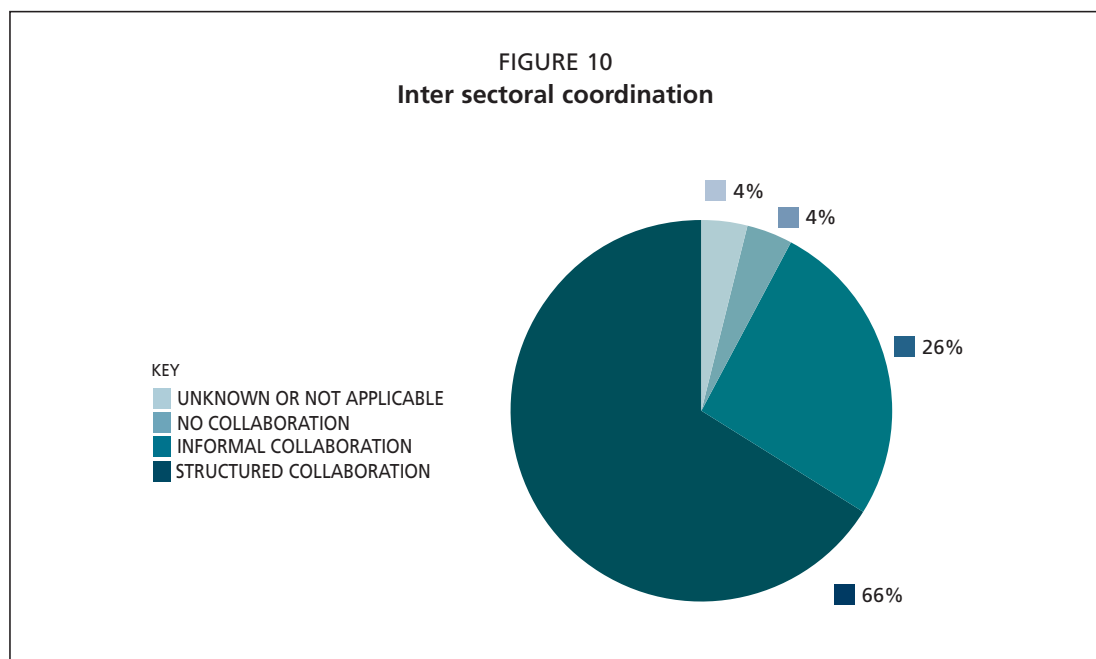
## COORDINATION

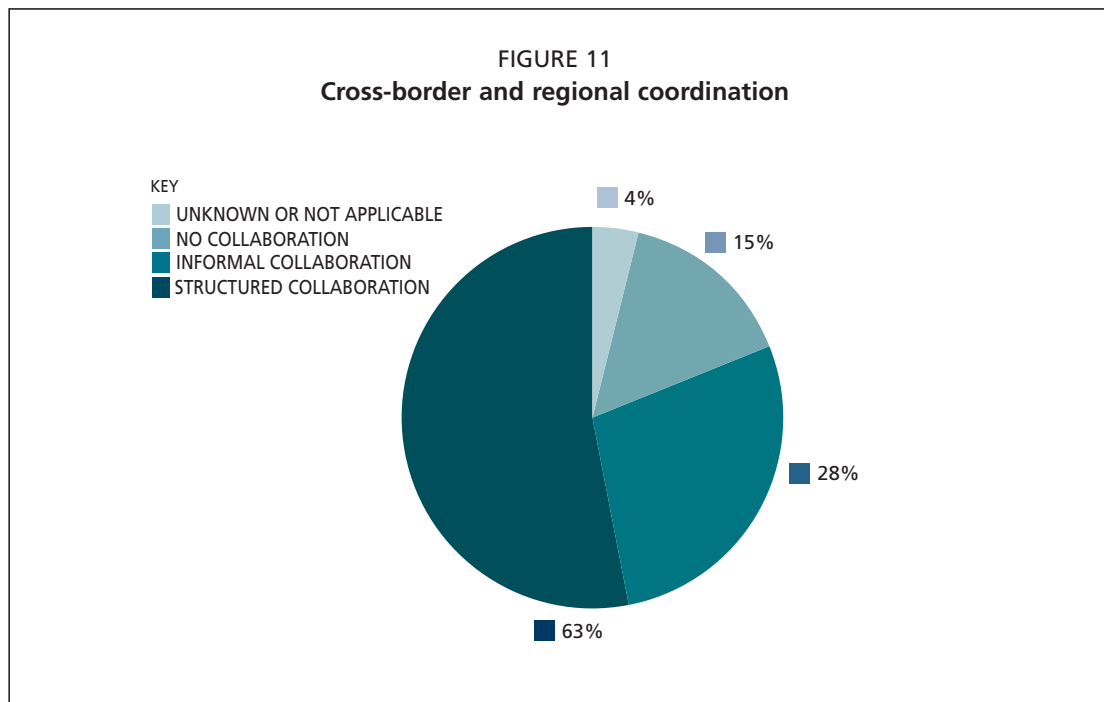
The animal-human health coordination is overall satisfactory. Regional coordination is insufficient, except in Africa. Inter-sector coordination exists in 92 percent of countries, in a structured or informal manner (Figure 10), in line with the Beijing international conference recommendations for an integrated approach (January 2006). Coordination is carried out through a national Avian and Human Influenza (AHI) task force or steering committee composed mostly of members from the public sector (from Ministries of agriculture / livestock, of health, of environment). In some countries, representatives from professional organizations (poultry sector) and NGOs are also part of the Task-force. This operates at an early stage when drafting the preparedness plan (integrated in most cases), testing the plan (desktop or field simulation) and also sometimes when implementing response (multi-sectoral response teams comprising not only animal health officers but also human health specialists, communication specialists, ornithologists, etc.).

Regional/cross-country coordination exists in 53 percent of the countries interviewed but remains generally insufficient except in Africa where 87 percent of the countries surveyed are involved in cross-border activities (Figure 11). Coordination operates via bilateral relations mostly or regional economic communities for regional or sub-regional coordination. In Africa, the regional economic communities as well as the Regional Animal Health Centres play a significant coordination role. Regional projects are also to be credited for their important coordination role (organization of regional meetings, training, workshops, etc.).

Country situation remains the same from the previous report. No specific improvement has been noted in terms of intersectoral or cross-border/regional coordination.

For inter-sectoral coordination, the depth of the real collaboration at the country level is not always optimal. It is usually much stronger at the central than at the local level. For cross-border or regional coordination, exchange of information or joint participation in simulation exercises at the border has never been mentioned.





### Main achievements

- **Strengthening of intersectoral coordination at the global level** - A tripartite technical consultation (FAO, OIE, WHO), in collaboration with IZSve and OFFLU, was organised in Verona (7- 9 October) on Influenza at the Human-animal Interface. This joint technical consultation is a milestone towards better global understanding of avian influenza risks at the human-animal interface. It is a forum for sharing the benefits of research and surveillance efforts in both fields, and will provide a valuable opportunity to discuss how tools and systems might be developed and further adapted for broader application at this interface.
- **Strengthening Cross border coordination** through meetings and workshops around infected countries and in Asia and Africa (see Text Box 7)

### Remaining gaps and the way forward

Cross-country and regional coordination is key in the case of TADs such as HPAI. This coordination is still insufficient and further efforts should be deployed to foster coordination at the regional level.

There is an opportunity for joint Regional Animal Health Centres and Regional ECTAD Units to play a greater role in coordinating regional activities for HPAI prevention and control, in close collaboration with technical regional organisations with an animal health mandate. Continuous support to these coordination centres is essential in order to ensure continuity of activity and enable countries to efficiently implement their HPAI control and prevention programmes.

As for the intersectoral coordination, the conclusions of the Sharm el Sheikh conference where the One World One Health strategy will be discussed will set the frame for future reinforced animal and public health coordination when addressing all priority Infectious Emerging Diseases including Avian and Human Influenza (AHI).

## TEXT BOX 7

**Example of cross-border collaboration on HPAI: 'strengthening cross-border activities among Bangladesh, India, Nepal and Myanmar to control possible cross-border spread of HPAI'.**

As a result of the concerning HPAI epidemiological situation in South Asia (largest HPAI outbreak in India in January 2008 and continual reporting of outbreaks in Bangladesh since March 2007), a FAO project funded by USAID was initiated in March 2008 in complement of other national HPAI projects in the region. This new project is specifically targeting cross-border issues regarding surveillance, communication and analysis of poultry trade and market information. The expected outcomes of this project are:

The outcomes of this project will be:

- The development of a platform for dialogue and information exchange between countries in the region on issue related to potential cross border spread of HPAI;
- Institutional strengthening to deal with the threat of transboundary spread of HPAI; and
- An increased understanding of ways to manage cross border trade to reduce risk of HPAI outbreaks.

A first concrete activity (survey) was launched in July 2008, aiming at selecting 'high risk' border areas (between Nepal-India and India-Bangladesh) where to specifically implement epidemiological and socio-economic research.

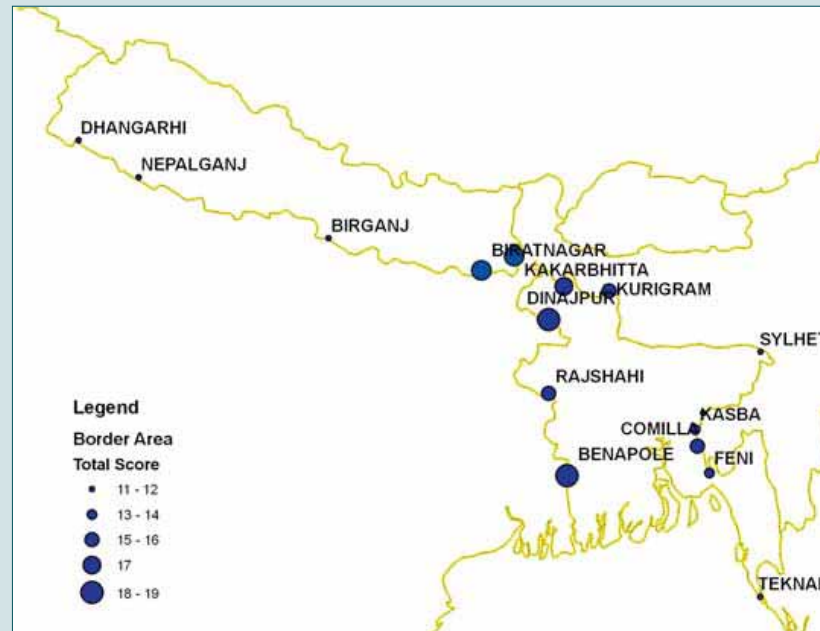
To select such areas, the main following demographic, epidemiologic and economic criteria were used:

- Human population densities, especially at the borders
- Poultry populations and densities, especially at the borders (poultry densities were calculated adding district duck and chicken populations divided by the district area)
- Outbreaks at the borders, matched spatially and temporally
- Cross-border and along the borders trade and traffic

All criteria were given a score of 1, 2 or 3. The score of 1 being "negative" or "low", a score of 3 being "positive" or "high", while a score of 2 was "medium" or "average"

All scores were given equal weight and were added. High scoring places were selected to implement epidemiological and socio-economic research.

The map below shows the results of the scoring and locates the targeted areas for research.



## COMMUNICATION

### Main achievements

- Strategic Information for Policy Development and Advocacy** - Along with its key communication partners including WHO, UNICEF, OIE, the World Bank, and others, the ECTAD Communication Unit has carried out reviews of numerous knowledge, attitude and practice (KAP) research studies in HPAI affected or at-risk countries to better understand the underlying dynamics of community and individual beliefs and behaviour, and incorporate this knowledge into its community-based approach to strategic communication for the prevention and control of HPAI. One innovative anthropological research study on rural beliefs and practices related to HPAI prevention and control commissioned by ECTAD Cambodia stands out in particular. The results of the study were written up in an exhaustive report entitled *Bridging the Gap: Between HPAI Awareness and Practice in Cambodia*, but also presented in a 20-minute documentary film entitled *Bridging the Gap* and a shorter eight-minute version entitled *Are We Listening*. The study explores pre-existing practices and perceptions of rural Cambodians with regard to poultry and poultry diseases in general and avian influenza in particular, and calls for a new wave of communication messages and strategies, based on emerging evidence from the study. The report and the films have been used at several important policy forums to advocate for re-thinking communication approaches to HPAI prevention and control. In Indonesia too, a social anthropologist has conducted a series of focus group discussions and in-depth interviews with poultry producers, poultry



traders and market managers in several geographical locations to better inform communication interventions. Elsewhere, innovative participatory communication activities have been developed and carried out in Lao People's Democratic Republic, Indonesia and Viet Nam, as well as Cambodia. These activities range from the training of village animal health workers as communicators at the community level, to community forums enabling community members to increase their capacity for decision-making to combat avian influenza. Community awareness activities have been conducted in hundreds of villages and reached tens of thousands of farmers, to inform and educate backyard poultry raisers and villagers on HPAI, means of transmission, and prevention and control measures. To reinforce these messages promoted through community forums, FAO along with other partners have produced a wide range of in-country communication materials including posters, leaflets, flip-charts, and newsletters. FAO has provided technical inputs for and helped develop avian influenza training packages in several countries, and has been involved in 'training of trainers' programmes at national and sub-national levels. Many of these training packages have been joint initiatives with partners such as UNICEF, WHO, CARE, CBAIC, and the Academy for Educational Development (AED), to name a few. FAO has also trained provincial and district staff in communication outbreak response and organized outbreak simulation exercises to improve communication preparedness and response.

- **Partnership-Building and Coordination** - Over the past year, the ECTAD Communication Unit, at headquarters as well as regional/national levels, has been proactively strengthening relations with all its key partners towards improving coordination, harmonisation of approaches, and guidance to countries on communication issues. This has taken the form of joint planning meetings, the conduct of joint review/assessment missions in several countries, conduct of joint training workshops, partnering in development and refinement of national communication strategies, and participation in key global and national processes. Of particular relevance is the inter-agency review of global guidance on HPAI communication, participation at the New Delhi Ministerial Conference, and the consensus-building process in the development of the *One World, One Health* strategy which is to be released at the Ministerial Conference in Sharm el Sheikh, in October 2008.
- **ECTAD Public Information Products and Initiatives** - In close cooperation with ECTAD veterinary, epidemiological and socioeconomic staff, the Unit is working on the development and production of key policy statements, documents, information and messages to promote and ensure understanding of strategic issues and recognition of FAO's role in HPAI prevention/control among partners and donors, and in cooperation with the FAO media division, among the media and public. The Unit has provided strategic input for ECTAD's key policy documents and reports, and has prepared the final texts and production for these products, which include the *FAO/OIE Global Strategy*, *FAO's Global Programme*, and the *FAO Report on the Global Programme*. Additionally, two key documents are being prepared by FAO for the October 2008 inter-ministerial meeting on avian influenza to be held in Sharm el Sheikh, Egypt an inter-agency strategy document on the *One World, One Health* initiative, and *Biosecurity for Highly Pathogenic Avian Influenza: Issues and Options*.

The FAO avian influenza website continues to offer updated news on the HPAI situation worldwide, through two monthly online newsletters – *AIDEnews* (aimed at a target audience comprising technical specialists in the veterinary and epidemiological sectors) and *FAO in Action* (aimed at the donor community and public at large). Basic research has also been completed and production started on a series of six strategic policy briefs covering HPAI communication, compensation, poultry vaccination, biosecurity and backyard poultry, wildlife and HPAI, and restructuring and rehabilitation. A media fellowship project has been launched in Indonesia and Viet Nam, and will start shortly in Egypt and Nigeria, involving journalists from print, film and photo, radio and online media. A total of 40 journalists from the four countries will participate in the project, which will be run in close cooperation with the agriculture/livestock ministries of the respective countries. The fellowship scheme, which is designed for promoting the best in community-based HPAI journalism through audio-visual media practitioners “embedded” with FAO regional and/or country teams, is an innovative break with traditional journalists’ training programs. In several countries of Asia, FAO has contributed to the development and broadcast of TV and radio spots on prevention and control of avian influenza, developed story lines for village fora, printed posters, booklets, brochures, calendars, T-shirts, and produced newsletters and bulletins.

- **Technical Assistance and Capacity Building in Communication Planning** - The Unit has been very active in technical assistance and capacity building for communication planning, where the emphasis has been on strengthening the technical capacities and competencies of Ministries of Agriculture/Livestock in a number of at-risk countries in outbreak, risk and behaviour change communication. It has taken a multidisciplinary approach, working closely with epidemiological, biosecurity, socioeconomic and compensation experts. Four major regional multi-disciplinary workshops in communication planning and skill-building for HPAI prevention and control have been held for North Africa, West and Central Africa, Central Asia, and East Africa, involving 40 countries and over 100 participants and partners. The Unit is also well on target for carrying out Integrated National Action Plan (INAP) assessments in countries of sub-Saharan Africa. FAO/ECTAD Communication Unit’s responsibility within the inter-agency INAP process is to evaluate the communication component of INAPs in individual African countries, assessing capacities and preparedness, and formulating planning assistance for HPAI communication strategies.

### **Remaining gaps and the way forward**

The ECTAD Communication Unit will continue to advocate at the highest policy levels for strengthening the animal health communication constituency, and at the same provide need-based technical support at the country level. Responding to the demand from member-states and Ministries of Agriculture/Livestock in particular, a strong focus in the coming year will be to create a critical mass of animal health communication specialists across the globe, to work at the animal-human-ecological health interface. Towards this, the ECTAD Communication Unit will concentrate on developing and implementing a robust program for rapidly building in-country capacities, competencies, and leadership in strategic communication for the prevention and control of HPAI and other trans-boundary animal diseases (TADs).

## PART 3

# Regional and country programmes

The following sections present an overview of programme activities in Asia and the Pacific, Central Asia, Africa, the Middle East, Eastern Europe and Latin America. FAO has devoted particular attention to the countries where the disease has become entrenched. by strengthening its support to these areas to help manage HPAI outbreaks and limit the disease implications for animal and human populations. FAO has continued to provide support to countries possibly at risk of infection and especially to those experiencing new HPAI outbreaks. Within the context of the Global Programme, FAO has mobilized funds to implement regional and country programmes for the prevention and control of HPAI in more than 130 countries through ECTAD sub-regional and country units as well as RAHCs. In assisted countries, FAO has supported the governments to develop and implement national strategic plans for HPAI control and enhance the capacity of the veterinary services. Efforts have been made also to contain HPAI outbreaks and virus dissemination in countries where sporadic outbreaks have occurred. Also, increased capacity building for early detection, rapid diagnosis and rapid response to contain and eliminate any outbreaks are key actions for at-risk, unaffected countries.

In line with the Global Programme's objectives and activities, projects implemented in the regions and countries have encompassed a wide spectrum of activities. Projects have:

- provided technical and policy advice, strategy design and assistance in line with FAO/OIE recommended guidelines for HPAI control;
- continued to carry out a continental epidemiological study to better understand disease behaviour and to identify risk factors
- strengthened the epidemio-surveillance networks to deal with the HPAI threat;
- drafted and reviewed HPAI emergency, preparedness and contingency plans and Standard Operating Procedures (SOPs) for HPAI outbreak management;
- strengthened field surveillance and developed a disease reporting system, particularly for wildlife through missions in which wild birds are captured and fitted with radio-transmitters for monitoring their movements;
- upgraded laboratory diagnosis capacities by providing technical training to regional and national laboratory staff and supplying the necessary equipment, vaccines, chemicals, reagents, disinfectants, protective gear and other items;
- established rapid response and deployed expert missions to analyse the disease situation in the field and prepare emergency plans/projects;
- assessed the capacity of veterinary services and provided training for emergency response;
- developed policies for influenza vaccine and vaccination campaigns;

- designed a funding matrix for emergency action to be used by the local FAO Representatives in discussions with donors, including socio-economics components, compensation policy and guidelines;
- increased public awareness on biosecurity hygiene in market chains and on the dangers posed by HPAI to animal health by communicating key messages about the disease and producing information tools, including audio and video recordings, textual aids, posters, training guidelines and presentation material.

## ASIA AND THE PACIFIC

The regional programme in Asia benefited over 17 countries in the region covered by FAO's Regional Office for Asia and the Pacific (RAP). Within the framework of this programme, the RAP ECTAD team and the ECTAD Coordination Unit in Kathmandu organized numerous stakeholders meetings in collaboration with OIE, USAID, the Government of Japan, DFID, SEAFMD, CIRAD, RVC (Royal Veterinary College) and ADB.

FAO has continued providing technical support to governments in the development and implementation of national strategic plans for HPAI control and to strengthen the capacity of veterinary services. Specialized international and regional experts have been employed addressing poultry disease, epidemiology, biosecurity, laboratory diagnosis, socioeconomic, virology and communication. Also, projects in Asia and the Pacific have provided equipment and supplies to participating countries through regional and country-level projects to upgrade national laboratories. Training of national staff is one of the main activities of FAO's projects in Asia that includes participatory surveillance and response training for the communities, training of trainers (TOT) at the provincial and regional level, laboratory training on equipment use, analysis and SOPs and table-top simulation exercises. These activities benefited all countries in the region and, in particular, the **Philippines, Sri Lanka** and **Timor-Leste**.

During the most recent outbreaks in **Bangladesh, Lao People's Democratic Republic, Thailand** and **Viet Nam**, the veterinary services in each country organized emergency surveillance teams and confirmed the outbreaks in various locations rapidly demonstrating the improvement in country response time compared to the last year.

In the countries at risk, projects activities gave special attention to the role of wildlife for virus incursions through migratory birds, the importation of infected poultry products and cross-border trading of live birds that is risky due to the open and porous borders (e.g. **Bhutan** and **Mongolia**). Cooperation has continued also with the Wildlife Conservation Society (WCS), who will continue to support wild bird surveillance activities through the capture, marking and sampling of live wild birds, and other UN partners, such as UNICEF, WHO and UNDP.

## Country Highlights

### **BANGLADESH**

#### *Activities*

Bangladesh has about 125 000 small and large poultry farms producing 250 million broilers, 6 billion eggs per annum and 33 million ducks. Approximately four million Bangladeshis are directly or indirectly associated with poultry farming. Since the detection of the H5N1 virus in February 2007, a significant number of outbreaks have been reported from 47 out of 64 districts and more than 1.6 million chickens have been depopulated. With the onset of summer the number of outbreaks is now on the decline.

Project activities have continued with the aim of building capacity and strengthen the central and regional veterinary services to deal effectively and efficiently with outbreaks of avian influenza, including surveillance, virus elimination, poultry market survey, biosecurity, emergency response and communication. Active surveillance was initiated in affected districts using Community Animal Health Workers in February 2008 with support from FAO and since then the situation is improved. Biosecurity has somewhat improved on farmers' own initiatives and also through training provided by FAO. FAO is also currently implementing a pilot advocacy programme through an non governmental organization (NGO) for improving biosecurity in wet markets. FAO experts have also carried out a rapid assessment mission to investigate outbreaks of avian influenza in poultry and recommended measures to contain the disease.

Until recently, the government used to: (i) declare a one-kilometre infected area; (ii) depopulate all birds; and (iii) ban rearing all types of chickens, ducks and pigeons in targeted areas following the detection of the avian influenza virus. Now depopulation is restricted to the infected farms and in-contact birds only and in case of infection in village chickens all birds within 0.5 km area are depopulated. All farmers (irrespective of farm size) are now compensated for depopulated birds.

The enhancement of laboratory capacity is also supported by FAO and other agencies. In particular, laboratory facilities and procured equipment for testing have been provided to the Epidemiology Unit, Central AI Management Centre in the Department of Livestock Services (DLS). This FAO ECTAD Technical Unit is currently staffed by national and international consultants (i.e. surveillance, laboratory services and diagnosis, emergency response and training, wet market and data analysis, outbreak response and epidemiology experts). This Unit provides continuing technical advice to the DLS and ensures coordination of material and training inputs from other donors. Training programmes have been provided to staff epidemiology on the use of TADInfo and GIS software, the use of PPE and rapid antigen detection kits. There are presently one central and six field disease investigation laboratories in Bangladesh and one national reference laboratory performing rapid antigen test and PCR respectively.

#### *Critical assets*

- The National Plan exists and the disease is diagnosed locally and control measures instituted. However, laboratory conditions need to be improved, as well as the

Government's response capacity to outbreaks.

- Active surveillance has been initiated and proves to be rewarding. Submission of isolates to reference laboratories of new outbreaks should be commonplace.
- Vaccination has not been implemented in Bangladesh and the Government was seriously opposed to vaccination. Recently, the Government has constituted a committee to examine the issue of vaccination as an additional tool and different possible options will be envisaged.
- The country has requested the OIE evaluation of the Performance of Veterinary Services (PVS), which will help reinforce the capacities of its veterinary services.
- Overall, Bangladesh has improved its capacities to prevent and control HPAI, but these capacities still need strengthening.

## **CAMBODIA**

### **Activities**

The Government of the Kingdom of Cambodia declared its first HPAI outbreak in January 2004. Since then, several HPAI outbreaks have occurred, affecting both domestic poultry and wild bird populations. Cambodia remains at high risk of re-infection from its neighbouring countries (i.e. the Lao People's Democratic Republic, Thailand and Viet Nam), which all have declared outbreaks in 2008. FAO has been providing technical assistance to Cambodia in the Government's efforts to control HPAI through an emergency programme that has played an active role in the provision of technical advice to the Government for the development and adoption of the National Strategy against Highly Pathogenic Avian Influenza.

The present programme, which is being implemented in collaboration with the Ministry of Agriculture, Fisheries and Forests (MAFF), covers seven fields of activity such as: (i) surveillance; (ii) laboratory diagnosis; (iii) reporting and response; (iv) biosecurity; (v) public awareness and education; (vi) socio-economics and livelihood strategies related to HPAI; and (vii) supportive and protective legislative environment.

To strengthen disease surveillance capacity, training for village animal health workers (VAHWs) and village chiefs (VCs) has been continued in the provinces that never received training before with the aim of making an urgent report when they suspect avian influenza. A total of 176 calls were received during the first quarter of 2008. A total of 714 VAHWs and 627 VCs were trained during the reporting period. TOT was also provided to provincial and district AI animal health trainers. Surveillance programme on wild bird was also initiated in collaboration with the WCS. Field activities were carried out in 14 provinces throughout Cambodia, with samples collected in eight of these provinces. As of the end of May 2008, 1 475 samples were collected from 738 birds of 58 species. The duck market surveillance programme was also expected to cover additional five provinces to those of 2007.

FAO through the programme has expanded the capacity of the laboratory at the National Veterinary and Research Institute (NAVRI) to carry out serology and virus isolation on an increased number of samples. The programme has also continuously reinforced the capacity of concerned authorities to contain HPAI with facilities for urgent diagnostic



investigation and a rapid response outbreak fund has been established to cover in time unexpected outbreak response.

Financial support was given to the Academy for Educational Development (AED) to produce a video to be used for the training of district veterinarians, VAHWs and farmers on biosecurity in poultry and duck production at the farm level.

With more than 90 percent of the total poultry being owned by small-scale and subsistence farmers where biosecurity and other required husbandry and hygiene measures that would minimise or reduce the risk do not exist, the programme has placed greater emphasis on improving public awareness and information dissemination, in collaboration with UN agencies and NGOs. FAO jointly organized a communication workshop with UNICEF at the end of 2007 to take stock of lessons learned and discuss results of knowledge, attitude and practice surveys, anthropological study of rural beliefs and rapid rural appraisal of gender and social aspects of livelihood impacts of HPAI. Results of these were used to revise the training course and manual for VAHW to include a section on communication. The programme has also fully supported three community forums on AI organized in remote districts that have no or limited access to mass media and mainstream source of information, to improve understanding of important key prevention messages. To reinforce the messages promoted by the community forum's, story line, two posters on quarantine and reporting of sick and dead birds were produced and distributed to farmers through VAHWs and VCs together with T-shirts and leaflets carrying messages from the storyline. Other communications and information dissemination materials and activities such as drama performances (79) and films (25) have also been continuously produced and shown to nine provinces as part of the second round of Community Theatre Project also financed by UNICEF.

The twenty-minute documentary, entitled Bridging the gap between awareness and practice: participatory learning of rural beliefs and practices on HPAI prevention and response in Cambodia, and the eight-minute version, entitled Are we listening: Community Perceptions and Avian Influenza have been translated into French and Khmer. These films have been shown at various international gatherings and workshops in Asian countries and abroad and considered as an important contribution to the development of communication strategies. Several TVs and radio spots on avian influenza were aired in provincial radio stations to warn people of the risks of contracting and spreading the disease.

### ***Critical assets***

- Cambodia's overall capacities to prevent and control HPAI remain fair: all outbreaks have been rather properly handled and since the first outbreak in 2004, capacities have slowly improved.
- The veterinary services need to be reinforced, in particular at the local level. One critical aspect is the lack of legislation regarding veterinary services. The chain of command is also very weak among the central level and the provinces, and among the provinces and districts.
- The Preparedness Plan exists and has been validated by national authorities in 2007. However, it has never been tested in real situation (no field simulation exercises and no outbreaks since 2007). Though with poor capacity, surveillance is in place, target-

ing in particular duck markets and wild bird populations. On the field, surveillance is carried out by the Village Animal Health Workers (VAHWs). The TADinfo system has recently been put in place in the whole country and should help improve the exchange of sanitary information from the field to the central level.

- The National Veterinary Research Institute in Phnom Penh is able to carry out molecular diagnosis. However, laboratory capacities are only at the central level and lacking at the provincial level.
- Vaccination is not allowed in the country and there is no vaccination strategy ready.
- There is no compensation policy in the case of sanitary depopulation. Also, there is no legislation or regulation regarding biosecurity, therefore it is difficult to enforce.

## **INDIA**

### **Activities**

India experienced a third wave of HPAI outbreaks in several districts of West Bengal state bordering Bangladesh on the western side. The disease jumped to the eastern side of Bangladesh affecting Tripura state of India and several outbreaks have been notified. More than 4.5 million poultry were depopulated to stop the spread of the disease with some degree of success. The virus from West Bengal clusters with clade 2.2 of H5N1 viruses as was earlier found in 2006 outbreaks. The HPAI epidemiological situation in India is most probably enzootic (regional) and the primary source of virus remains unknown. Regular clinical and laboratory based surveillance activities are continuing across the country.

FAO has started implementing two projects that will focus on strengthening the capacity of veterinarians and wildlife staff to collect samples for avian influenza surveillance and to monitor the cross border spread of the disease through poultry value chains.

### **Critical assets**

- Capacities of the veterinary services are rather good in the country. Activities related to strengthening of VS are directed towards trainings in disease response (staff receives regularly training) and development of lab infrastructure.
- The Preparedness Plan exists, has been validated and regularly tested through outbreak response. Prevention capacities for HPAI are good.
- The Government has implemented an active and passive surveillance since 2004. A large number of samples is regularly collected and analysed in laboratories. Control at borders, however, required reinforcement, as do surveillance activities in wild bird populations. All HPAI analyses can be performed at the national level. BSL-4 fully equipped laboratories with modern facilities exist. Repeated incursions of the disease have been controlled since 2006, through stamping out and appropriate disinfection process.
- Although the national action plan includes option of using vaccination as one of the tools, it has not been used in any of the three outbreak incursions of 2006, 2007 or 2008. The national operation plan describes the procedure to draw vaccine from the national strategic reserve but a detailed strategy does not exist.
- Compensation has been decided through discussions with stakeholders and is gener-



ally considered adequate. This is paid to both commercial and village poultry producers through cost sharing between central and state governments.

- Biosecurity is high only for large commercial farms (GP, parent farms). No biosecurity exists in small commercial and backyard farms. FAO efforts have facilitated the improvement of biosecurity in large and small commercial farms involved in export of poultry products and few metropolitan live bird markets.
- The country has good prevention and control capacities overall; therefore, the Government declared the country free from HPAI in 2006 and 2007, while effectively containing the disease in 2008. As India shares borders with infected countries (i.e. Pakistan, Bangladesh, Myanmar and China), a targeted surveillance programme is required and border control measures need to be reinforced. Similarly, wildlife surveillance needs strengthening.

## **INDONESIA**

### **Activities**

Thirty-one of thirty-three provinces have reported HPAI outbreaks since February 2004. Indonesia has become the global hotspot for the HPAI epizootic for human H5N1 infections. Due to the high levels of H5N1 virus circulating in poultry and the frequent contact between poultry and humans, Indonesia is potentially the most likely origin of a human influenza pandemic. To date, several human cases were reported, most of which were fatal. HPAI remains endemic in Java, Sumatra, Bali and South Sulawesi with sporadic outbreaks reported from other areas.

FAO provides technical assistance to the Ministry of Agriculture by implementing projects aiming at enhancing the understanding of HPAI, early detection, reporting, epidemiology, control of the disease and strengthening the laboratory diagnostic services.

Good progress has been made in disease detection and outbreak control through the FAO-initiated Participatory Disease Surveillance and Response (PDSR) programme that empower communication and strengthen veterinary services to plan and implement HPAI prevention and control activities in villages across endemic areas of Indonesia. PDSR capacity has been established in 27 provinces of the country and has also provided training to local government animal health officials that are now working in the field.

FAO also supports the Ministry of Agriculture to further engage commercial poultry producers to improve their control and prevention of HPAI and to better characterize Indonesian poultry production systems. A series of socio-economic studies have been undertaken in Bali, Medan and Jakarta including a) market chain and poultry industry restructuring measures, currently being developed and implemented in major cities, and b) a livelihood survey, to assess the impacts of the effectiveness of present and future control measures. FAO has also advised National AI Committee (KOMNAS) on the design of two project proposals related to industry restructuring and strengthening the compensation system. These will include the cost effectiveness analysis of the PDSR programme as a means to promote long term sustainability and the cost analysis of the OFFLU- led vaccination strategy.

FAO participated in a series of regional live bird market (LBM) workshops conducted by

USDA with the aim of mapping poultry movements in selected live bird/traditional markets and identify high-risk practices. A number of recommendations resulted from these workshops to improve sanitary standards and management practices at traditional and live bird markets. In addition, the joint WHO/FAO project aim to develop an environmental sampling tool in live bird markets, with initial results indicating a high level of environmental contamination (West Java). Also, it strengthens biosecurity among small-scale commercial poultry farmers in Bali and increases awareness and willingness to implement appropriate biosecurity practices by small-scale poultry farmers. A four-year project has been designed by the Australian Centre for International Agriculture Research (ACIAR) to build on this work, and strengthen biosecurity in the non-industrial commercial sector.

FAO's Information, Education and Communications (IEC) team has made significant progress in enhancing the quality of communication working with media agency campaigns in Bali and Tangerang using commercial and community radio stations to raise community awareness of HPAI and disease mitigation measures for controlling also other diseases and to increase productivity. Risk Communication workshops were held in Sumatra and Jakarta. Additionally, the IEC team developed a community vaccinator training manual, vaccinator instruction sheets, posters and a vaccination flip chart.

Through OFFLU, FAO assessed the efficacy of current vaccines, to monitor changes in the virus and identify new seed strains as necessary and define an appropriate vaccination strategy. Field isolates, representative of geographic areas and production systems, have been collected and are being characterised by national and international referenced laboratories.

### ***Critical assets***

- The capacity of the veterinary services in the country remains poor and there is no proper chain of command. Due to the governmental decree for decentralisation, all animal health services are at the discretion of the local elected District Administrator and most of the districts do not have a veterinarian available.
- The National Preparedness plan was endorsed by the Ministry of Agriculture in 2006. While the Plan is quite comprehensive and has been tested, there are still weaknesses such as: (a) the lack of ability of the Ministry of Agriculture to fully engage with the commercial poultry industry and promote public-private partnerships; (b) the poor capability of the National AI Committee (KOMNAS) to coordinate across the government stakeholders with the international partners; and (c) the decentralisation and the lack of a line of command from the Ministry of Agriculture to district livestock services that is a severe challenge for to implementation of HPAI control programs.
- Surveillance capacities are good. The FAO-led Participatory Disease Surveillance (PDS) programme is operating in about 60 percent of the districts of the country and is present in all highly endemic areas (Java, Bali, Sumatra and South Sulawesi). A new PDSR (PDS and Response) information system has been installed and better epidemiological data will be available over the next six months. Sampling in domestic poultry and wild birds occurs via the PDSR system and international projects when cases are detected, the Ministry of Forestry or NGO programmes.
- The laboratory capacity is still limited. There is a central veterinary research laboratory which is also designated as the national reference laboratory. In addition, there are

seven Disease Investigation Centres in the country and an eighth under construction in Java. Indonesia has access to the OIE/FAO Australian Animal Health Laboratory (AAHL-CSIRO) as a reference laboratory in Geelong. A total of 234 Indonesian isolates have been sent to AAHL for characterisation in the past two months. The problem is not access to labs, but the willingness of the Director of Animal Health to issue an export certificate for the despatch of field isolates to AAHL and FAO is facilitating this process.

- Control capacities remain insufficient despite the efforts deployed. Rigorous response is limited since the disease is endemic in large parts of Indonesia and local authorities have many other priorities. Stamping out does not occur. Immediate focal depopulation may occur through the Participatory Disease Response component of the PDSR system. It is difficult to enforce depopulation due to the slow nature of the compensation system, which is also poorly known to exist at the local level. Movement control is considered to be extremely difficult. The Quarantine Agency is responsible for external and inter-island movement control but local government administrations are responsible for inter-Province and inter-District movement control. Disinfection is practiced liberally by local government administrations but often in isolation and therefore of limited value.
- The implementation of the vaccination strategy is not effective, though improved through OFFLU that will assist in revising it and recommendations on HPAI vaccination in poultry will be issued in due course. Barriers to the efficient application of the tool in control of H5N1 AI virus in Indonesia include the lack of clear technical direction as to which vaccines are effective against currently circulating field strains and a defined vaccination strategy. A number of problems have been encountered including the inability to adequately monitor vaccine use and variable vaccine efficacy. Further problems have been met with small-scale producers in sectors 3 and 4 with insufficient vaccine or logistics to provide adequate coverage, inadequate cold chain, poor biosecurity and biosafety and weak programme management. There are three (two private and one small public) Indonesian vaccine production plants. Other vaccines are imported from China, Mexico, USA and the Netherlands.
- The mechanism for administering the compensation is cumbersome; payments are usually late and sometimes does not materialise at all. Confidence in the system is low. A WB project is funding a study to review the current system and develop an improved operational system to deliver compensation in the field. Compensation is available only for sector 4. There is a Ministerial Decree on compensation which is revised every year and a well defined procedure.
- In sector 1 and 2, biosecurity measures are fair, while in sectors 3 and 4, measures are almost non-existent. Biosecurity at live bird markets (LBM) is very poor and markets are rarely rested and almost never properly cleaned and disinfected. Collector yards are also a major problem with totally deficient biosecurity. Slaughter facilities at LBMs are unhygienic. Less than 10 percent of poultry are slaughtered in a proper slaughterhouse. FAO has implemented a project to provide training in biosecurity improvement for Sector 3 poultry producers in Bali. The Coordination Management Unit would like to see such activities replicated in other locations.

- Indonesia receives strong support from the international community and in particular from FAO which has deployed three national projects in the country and one regional project. While the situation remains enzootic with the HPAI virus circulating in the domestic poultry and the wild bird populations, there is concern with regard to a potential risk of a pandemic. Capacities to prevent and control the diseases have proven to be increasing over the past six months, both in terms of vaccination strategy and laboratory capacities. Sustainable international support remains instrumental but financial absorption capacities are slow.

## **LAO PEOPLE'S DEMOCRATIC REPUBLIC**

### **Activities**

The outbreaks in the country were reported by veterinary workers and subsequently reported directly by the Department of Agriculture and Forestry Office (DAFO) and Provincial and Agriculture and Forestry office staff. The first outbreak was initially detected in backyard poultry and not in a commercial farm. This indicated that the passive surveillance network through veterinary workers in combination with adequate disease investigation sampling by well trained district and provincial livestock officers, is functioning.

Over 4 500 poultry were depopulated in six villages diagnosed with HPAI. Stamping out was conducted within one kilometre radius of the infected points. Diseases investigation including sampling was carried out in all villages and poultry were closely monitored for four weeks. Movement of trade of poultry was banned in all three concerned districts. Compensation is implemented, framed by a well-defined compensation procedure enacted through ministerial decree/order. Compensation rate is based on 60 percent of the provincial market value by weight and 1 to 17 days is the average delay targeted to compensate the farmers. However, in some cases the farmers were compensated within the day the depopulation has taken place. As regrettable as it might seem, the new outbreaks have shown that the improved farmers' awareness, the success of veterinary workers training in reporting suspicious events, the fast response of the trained district and provincial livestock officers have led to early detection and implementation of control measures.

FAO has continuously supported the government of the Lao People's Democratic Republic in its fight against HPAI by developing the capacity of the concerned government counterparts, from the national down to the community level. FAO has assisted the government in drafting a number of diseases as well as veterinary law which is currently being submitted to the National Assembly. Furthermore, FAO is supporting the strengthening of regional cooperation by facilitating the holding of and participation to regional meetings and workshops. It is also upgrading the National Animal Health Center Laboratory and developing a national veterinary curriculum in collaboration with the World Bank.

Since January 2006, more than 4 800 veterinary workers have been trained throughout the country, more than 1 500 farmers trained on biosecurity issues, and 260 provincial and staff trained twice on technical avian influenza surveillance and response issues. Furthermore, for the first time, two simulation exercises to test and improve rapid response capacity have been conducted, and have shown to be an adequate way to enable the transfer of theoretical knowledge into rapid response. FAO has supported laboratory systems to

strengthen disease surveillance. Training and equipment have been provided to staff at border checkpoints. Also, FAO assists the country in enhancing biosecurity measures, assessing socio-economic factors and their impacts on livelihoods to review the contingency plans.

In collaboration with UN agencies and international organizations (WHO and UNICEF, the Academy for Educational Development and CARE), FAO has developed and distributed IEC materials to raise awareness on HPAI. Material targeting smallholder poultry farmers has been distributed in all 17 provinces using a combination of public awareness activities (i.e. posters, calendars, low-literacy booklets, CDs, T-Shirts and jackets), World Food Programme food distributions, the Lao Women's Union and local administrations. These messages were also distributed using public announcements in markets, radio and television. These activities were conducted in more than 800 villages in which more than 50 percent were women.

### ***Critical assets***

- There is no contingency plan document in the Lao People's Democratic Republic but provincial and district Rapid Response Teams are designed, including surveillance programmes, control activities and a compensation scheme. Response capacities are good. Table-top exercises have been carried out and one field simulation exercise was recently completed, but these have been conducted only at the Provincial level. There is a need for a comprehensive plan document which would clearly lay out the roles and responsibilities at all levels and harmonize practices within the country.
- Surveillance capacities are weak but surveillance plans are in place. Active reporting is slightly improving but still a major constraint for non-commercial sector. There is no or limited wild bird surveillance. One main limitation to surveillance is the country laboratory capacity. All diagnosis is done at the central laboratory. The staff is well trained and a full range of diagnostic techniques is available. However, there is limited capacity due to space considerations, biosafety level, and limited inputs for virus isolation (SPF egg inoculation) and RT-PCR reagents/supplies.
- The veterinary services need to be reinforced. The chain of command is broken between Province and Central government and much devolution of decision making is given to the Provincial level.
- Vaccination is not practiced in the country and was not given serious consideration to date, although a trial involving 5 000 ducks and 5 000 chickens was initiated and terminated by outbreak depopulation. There is no vaccination strategy ready.
- Biosecurity level in the Lao People's Democratic Republic is generally poor, with some exceptions: it is minimal at commercial layer units and non-existent in backyard production systems. Some activities have been implemented in small-scale commercial and backyards system over the past six months.
- The overall capacities of the Government of the Lao People's Democratic Republic to prevent and control HPAI are fair: targeted active surveillance is in place and has not detected disease to date. Response and control measures appear to be effective when the disease is identified. However, the disease will be picked up quickly from commercial sector but may circulate unbeknown to the animal health authorities in rural areas and in backyard production systems. Overall, the country epidemiological situation needs to be better known through additional epidemiological surveys

and enhanced surveillance programme including wild birds and need to improve laboratory capacity and infrastructure. Depending on the results, a possible shift to a vaccination strategy could be envisaged. The Lao People's Democratic Republic is criss-crossed by trade routes from Viet Nam, China and Thailand (in particular) with insufficient border control and thus the country is at risk of the level of control in those neighboring countries.

## **MYANMAR**

### **Activities**

Unlike the first two waves, the latest wave of outbreaks occurred among native (village chickens) and the first human case was also recorded during this wave. The country has been declared HPAI free since April 2008 and farmers in affected areas are now allowed to restock.

FAO has been supporting the Government of Myanmar's National Strategic Plan through the AI integrated programme (consisting of three projects). FAO has provided the concerned government agency, the Livestock Veterinary and Breeding Department (LVBD), with transportation facilities, field containment, laboratory equipment and other field supplies for surveillance and response activities. Technical assistance has been provided to LVBD in preparing and updating the Contingency Plan for Emergency Control of HPAI. The integrated programme has also supported trainings, both in-country and abroad, on surveillance and response, biosecurity and disease diagnosis for LVBD veterinarians and animal health volunteers (AHV). Officer from concerned government agencies, NGOs and private sectors working on wild birds were also provided training on wild bird surveillance, capturing and sampling techniques. Public awareness raising campaigns were also conducted among villagers living near-by or along wild bird sanctuaries.

### **Critical assets**

- The Preparedness Plan has been approved by the national authority and printed, to be adopted as operational manual. It contains zoning relevant for disease control, outbreak investigation, disease reporting and chain of command, stamping out and destruction of carcasses, sample collection and submission to national and international laboratories, information related to HPAI, forms needed during the process such as outbreak investigation form, etc. Technical staff related to disease control activities have been trained on the details of the Plan. The Plan was used for the actual outbreak containment and then revised in March 2008 at the points recommended by field staff (the Plan was drafted based on the guidelines recommended by international organizations and the local experience in dealing with the first wave of outbreaks). The Plan was not fully applicable to the second and third waves of the outbreaks when epidemiological features were different. Thus, review and improvement of the Plan is foreseen.
- Surveillance capacities are fair and are currently being strengthened. Plan for active surveillance includes technique for sampling and sample collection, laboratory procedures and interpretation of laboratory results with consultations between FAO



and LBVD. Active surveillance has been conducted in the population identified as high risk group including, poultry being raised in the previously reported areas with HPAI outbreaks with the results of sero-positive ducks (even though no clinical signs and no virus isolated), wetland areas and live bird markets. In the wetland areas, samples not only the domestic poultry but also wild birds were collected. Passive surveillance has been strengthened through improvement of awareness by farmers and clear reporting line.

- The central laboratory in Yangon can perform confirmation by both virus isolation and PCR while the laboratory in Mandalay performs only PCR, as bio-safety of laboratory facilities do not allow for virus isolation. LBVD also regularly seeks assistance to reconfirm and perform sequencing from National Institute of Animal Health in Thailand.
- Control capacities are good and stamping out, disinfection and carcass disposal are conducted appropriately. Actions to respond to any positive results in ducks have been discussed and become clearer during the past six months.
- Vaccination is not implemented and is not included in the Plan as a potential control tool.
- There is no well-defined compensation strategy and no direct compensation scheme for HPAI control programme in Myanmar. However, there is an indirect non-monetary compensation scheme called relief programme for the farmers who were affected by HPAI. This relief programme is indeed a compensation strategy since it provides day-old-chicks to replace breeding stock, poultry feed and vitamins. It also provides slow interest loan to the affected farmers.
- Biosecurity measures are in general poor, except for the large scale commercial flocks, particularly the breeders. Some activities have been implemented over the past six month to upgrade biosecurity measures through provision of training and experts.
- Myanmar overall capacities to prevent and control HPAI are fair and continuously improving, with the support of FAO-led projects notably. While the country is currently officially free of HPAI, surveillance and laboratory diagnostic capacities remain of paramount importance to ensure early detection, since the Myanmar is surrounded by infected countries.

## **NEPAL**

### **Activities**

Nepal is still one of the few countries in Asia that has to date escaped the devastating effect of HPAI. However, the threat of the disease to Nepal's poultry sector, which includes a well developed and regionally concentrated commercial sector was already apparent following outbreaks in Bangladesh and India in 2007 but has intensified with the outbreaks right on Nepal's border with West Bengal.

FAO has started activities under a new project through an agreement with the Government of Nepal to provide immediate technical assistance to strengthen emergency preparedness for HPAI. This project focuses mainly on strengthening the capacity of HPAI disease surveillance and diagnostic laboratories, containing any eventual outbreaks of HPAI and improving biosecurity measures. Additionally, a socio-economic assessment will be car-

ried out along with a communication and public awareness campaign. Complementarily, a regional project focuses on AI training for government personnel and strengthening of coordination between related AI projects. A sub-regional project, managed by FAO and dealing with the cross border issues surrounding transboundary diseases, including HPAI is also based in Kathmandu.

### *Critical assets*

- Nepal remains at risk of infection in light of serious HPAI disease activity in nearby Bangladesh and sporadic outbreaks in neighbouring West Bengal state of India.
- The veterinary services (VS) need to be strongly reinforced. Currently, activities related to strengthening VS are limited to trainings on awareness about the disease, epidemiology and outbreak response. Not many resources have been mobilised to improve the infrastructure.
- The National Avian Influenza and Human Pandemic Influenza Plan 2006–2008 exist but have not been validated by national authorities or tested so far. Details on surveillance strategy, response and other activities to be undertaken are lacking.
- Surveillance capacities in the country are poor. The National laboratory has only facilities to conduct rapid antigen tests for Influenza A virus and counts on the collaboration with an OIE/FAO Reference lab in Geelong, Australia.
- There is poor capacity to mobilise the existing resources and manpower should an outbreak happen. A CMC-AH mission was fielded to advise the government to mobilise the existing resources in country to prepare for response activities. SOPs are being developed.
- Vaccination has not been implemented so far since the country is currently uninfected. Vaccination is not envisaged as a control tool and no vaccination strategy has been prepared.
- Compensation has not been implemented. Nonetheless, a compensation plan has been developed.
- Except in few large commercial farms, the overall biosecurity is poor in other sectors. Farm biosecurity is of concern with the large commercial farmers only at their own initiative.
- There is currently poor capacity to prevent and control HPAI in Nepal and existing human and financial resources are not mobilized to prepare for crisis. As a result, critical documentation on surveillance and outbreak response does not exist. This level of unpreparedness is of serious concern since the neighbouring West Bengal state of India is infected, and introduction could occur at any time. There is an urgent need to reinforce Nepal's capacities in all fields. Developing outbreak response capacity is a priority.

## **THE PEOPLE'S REPUBLIC OF CHINA**

### *Activities*

China officially reported the first outbreak of H5N1 HPAI on January 2004, though it was first isolated in 1996. Since then, many outbreaks occurred in domestic poultry and wild



birds and the situation can be considered as enzootic. Several human cases have been diagnosed to date, out of which many persons died. The cold weather is incriminated to explain the current re-emergence of cases.

FAO assists China to prevent and control avian influenza through the enhancement of the capacity of the veterinary services, increased surveillance, emergency preparedness, detection and early response to outbreaks. Assistance has been provided also to laboratories in Tibet, Qinghai and Xingjiang provinces where outbreaks in domestic poultry and in wild birds occurred. Project activities have supported HPAI outbreak investigation techniques, risk analysis and disease information analysis capacity within the Animal Health and Epidemiology Centre of the Ministry of Agriculture. Diagnostic equipment and materials have also been provided to appropriately set-up provincial laboratories and furnished transport containers to enable the submission of samples to National Reference Laboratory for diagnosis. The Provincial and national laboratory capacity is good and the national veterinary research laboratory (and national diagnostic reference) located in Harbin is recognised internationally. Training courses in the use of Geographical Information System (GIS) and Spatial analysis applied to disease epidemiology have been organized for local staff. A national policy meeting was also held in Beijing to review the national surveillance and control policy that resulted in the formulation of practical recommendations to modify the current strategy. Market chain studies have been conducted in the country to refine compensation strategies.

### ***Critical assets***

- New regulations are being established to better structure the veterinary services and strengthen emergency preparedness. The chain of command remains a concern in a highly decentralized country.
- The Preparedness Plan exists, it has been validated by the national authorities and has been tested during real outbreaks handling. While the Plan is quite comprehensive, epidemiological investigation remains weak as well as tracing back and forward activities.
- Surveillance should be strengthened at local and provincial levels. Surveillance efforts in live bird markets and backyard farms should be intensified and the results of the campaigns made available in a timely manner. Some basic epidemiological understanding is still lacking. Disease investigation stations have been established at the provincial level to increase the collection of sound epidemiological baseline data. Post vaccination surveillance activities and virus monitoring have been maintained at the same level comparing to the previous year.
- Responses to disease outbreaks are prompt and coordinated; however some variations exist among provinces (remote areas are difficult to access in some poor provinces and therefore limit the surveillance and response capacity).
- Vaccination remains the main tool for control. Vaccine research into novel vaccines (biotechnology, principally) is highly promoted. Preventive and emergency ring vaccination is used according to the national plan; the vaccination strategy is well defined and updated on an annual basis. Vaccine is provided free to all but the largest farms and vaccination is carried out by government veterinarians, private veterinarians, ani-

mal health workers or farmers under the supervision of veterinarians. The vaccination strategy needs however to be better focused and studies should be carried out to assess the potential impact if the level of vaccination was to be reduced in the future. New vaccines are being developed. Novel vaccines have undergone several pilots testing in the field but results require further analysis.

- There is a well defined compensation strategy and this has been implemented during the last outbreaks.
- A Biosecurity level remains fair and depends on the production sector.
- The overall country capacities to prevent and control HPAI are fair. China's strategy for HPAI control, backed up by strong field operations, has been effective in limiting the number of outbreaks and controlling their spread. However, it requires a high level of human and financial resources particularly for vaccination. There would be merit in reviewing some aspects of the strategy from an epidemiological and economic perspective. Additional efforts still need to be brought into progressively control H5N1, especially in terms of surveillance and epidemiological knowledge of virus circulation. This would allow better targeted surveillance and vaccination control strategies. However, the immensity of the country, the vast poultry census, as well as the existence of remote hilly areas are major constraints to implement a systematic and efficient surveillance.

## **VIET NAM**

### **Activities**

Avian Influenza is enzootic in Viet Nam since 2004. Since then, a number of waves of infection have hit the country affecting domestic poultry and wild birds, with decreasing magnitude but with fatal cases in humans. The outbreaks are occurring more in the North of the country, affected mostly unvaccinated ducks. Viet Nam continues to apply mass vaccination campaigns (March-April & October-November), though there are a number of provinces where more regular vaccination is being implemented. The Avian Influenza Strategy for Animal Health sector is being reviewed with FAO providing technical assistance.

A Preparedness Plan exists and has been officially validated by the government. It has not been tested during a proper simulation exercise, but it is regularly tested in real situation during the HPAI outbreaks control. The Integrated National Operational Programme for Avian & Human Influenza, the Green book, still provides overarching guidance for work plans and all FAO projects conform to this work plan. The OIE evaluation of the Performance of Veterinary Services (PVS) report also provides useful guidance for needs in further upgrading the Vietnamese veterinary services that are still weak.

Project activities included operational support for quarantine services at the border with PR China where 112 tonnes of poultry and products were confiscated and destroyed. Additionally, some of these consignments were Influenza A (not H5N1) positive. Further operational assistance was provided to support post-vaccination surveillance through 65 000 blood samples and 959 swabs. The biosecurity activities were completed with training of the control farms and provision of the same equipment as given to the 'biosecure' farms at the start of the pilot with encouraging results. Training for district veterinary staff in disease outbreak investigation has also been undertaken in three regions. The passive

and active surveillance (CADS) in the four provinces are currently being evaluated in two provinces and in two "control" provinces.

Activities continued also for the completion of animal isolation unit at National Centre for Veterinary Diagnosis, including vaccine efficacy trials, the completion of "Paravet as Communicators" by AI programme communications team, wild bird surveillance via Letter of Agreement (LoA) with WCS in the Mekong delta, and the LoA with the University of California (Berkeley) to undertake surveys in certified market chain.

Also upgrading is underway for the Laboratory Network system to Laboratory Information System (LIM) and a LoA has been signed to support post-vaccination surveillance following the first campaign of 2008.

Consultancies were completed on upgrading Veterinary Ordinance to Veterinary Law and in appraisal of rapid response capacity. Upgrade of cold-chain for AI vaccine storage in 27 provinces was completed.

With respect to restructuring of the poultry sector, the Government of Viet Nam policy aims at industrializing the poultry sector. FAO is strengthening evidence-based decision making and stakeholder processes to operationally restructuring policy and in particular seeking to mitigate detrimental socio-economic impact. FAO's approach operates at two levels; firstly policy advisory and advocacy, leveraging influence within government and with other partners. Over the last 6–12 months, the perception of the value of biosecurity and restructuring as a strategic approach operating alongside targeted vaccination and modified stamping out has increased significantly. This needs to be matched with increased resource allocation. The GoVN has agreed to the establishment of a biosecurity technical working group to provide a knowledge management tool and to inform policy development. M and E indicators for restructuring have been developed. These will help to drive implementation of activities, in particular to review the Province level Poultry Restructuring Plans. FAO has signed a LoA engaging the Department of Livestock Production (DLP) in a series of activities, providing internal evidence for policy development and legislative review. The second approach involves support to implementing poultry sector restructuring at field level. This was developed through a participatory planning process with DLP and the four pilot Provinces. A preliminary survey and mapping of the poultry value chain has been completed providing a spatial database of 7 200 premises including hatcheries, producers, traders, feed retailers and slaughter points. A more detailed survey of a sub-set of commercial farmers is underway focusing on biosecurity and production practices. Consultants have been recruited to develop biosecurity and hatchery best practice and good practice guidelines for restructuring, leading to a decision support tool kit for Province level poultry restructuring planners. A significant challenge ahead is to develop a stakeholder process, linking Central and Provincial policy development with the private sector that will be the key in funding and implementing the restructuring plans.

### ***Critical assets***

- The veterinary services and the Chain of Command are weak.
- Most of the surveillance is performed by sero-monitoring, for evidence of viral activity and post-vaccination surveillance, following the mass vaccine campaign. Small pilot Community Active Disease Surveillance experiences have also been conducted in four

pilot provinces but the insufficient information from the field makes rather difficult to fully understand the situation from an epidemiological perspective.

- The laboratory capacity needs to be strengthened in the country. Seven laboratories routinely carry out Haemagglutination inhibition and Real-Time PCR testing; two laboratories (National Centre of Veterinary Diagnosis – NCVD in Hanoi and the National Institute of Veterinary Research - NIVR in Saigon) also carry out virus isolation; however there is a poor coordination between NCVD and the NIVR.
- Since 2005, vaccination of poultry is used to control H5N1 HPAI, framed by a well-defined strategy, through bi-annual mass vaccination campaigns; however, in many provinces the twice yearly mass campaigns have become more continuous throughout the year, especially in southern provinces with a high share of ducks in the poultry stock. Special attention is being paid to the hatching of waterfowl, particularly ducks, in order to ensure that new-born birds are immediately vaccinated as part of the national campaign. It is currently very costly and entirely subsidized by the government. Vaccines come 99 percent from China. Today the main issue is to support the government in its willingness to move from a mass vaccination, fully subsidized, to a more targeted strategy with cost sharing with the private sector, and without increasing the risk of outbreaks and especially human cases. However, more research is needed to obtain sound, longer term strategies particularly in the field of duck vaccine efficacy, targeted vaccination strategies related to surveillance and local response capabilities, cost sharing, socio-economic impacts of control programmes including depopulation, bio-security at farm and market levels and control of movements and communication.
- Compensation is implemented since late 2004, following a well-defined compensation scheme; the compensation rate is usually at the rate of 30–50 percent of the market price with depopulation losses that have been compensated up to 70 percent for HPAI and other TADs.
- Biosecurity measures are very poor in the country. Some minimal investments have been done on sector 3 farms but there is no incentive for farmers to implement such measures. Veterinary ordinances recommending biosecurity measures for farming, marketing and slaughtering are not fully enforceable. Bio-security pilot experiences have been tested in some provinces and in sectors 3 and 4 but so far, up-scaling at the country level is not currently achievable.
- HPAI epidemiological situation in Viet Nam is complex, involving multiples species and all systems of production, especially backyard production systems. The majority of the recently reported outbreaks have been in unvaccinated duck flocks. Overall national capacities to prevent and control HPAI are fair. The main strengths are the government's strong commitment and leadership since the beginning of the crisis. While the choice for mass vaccination is not technically discussed, the 100 percent subsidized implementation process is a burden for the national treasury and as a result, difficult to sustain. A partial shift of cost to the private sector is an option that needs to be discussed.

## SUB-SAHARAN AFRICA

The three FAO Regional Animal Health Centres (RAHCs) represent the specificity of this region. These RAHCs are located in: Bamako for West Africa, Nairobi for Eastern Africa, Gaborone for Southern Africa and the Indian Ocean islands. Much activity has been dedicated to consolidate technical services coordinated from these sub-regional hubs. Donors funded projects have complemented HPAI activities carried out under FAO TCP projects for Eastern and Southern Africa. The FAO HPAI programmes in Africa are implemented in close collaboration with the African Union-Interafrican Bureau for Animal Resources (AU-IBAR), OIE and WHO, OFFLU and Wetlands International and Birdlife International.

Several countries received FAO technical assistance among which **Angola, Chad, Côte d'Ivoire, Eritrea, Ethiopia, Kenya, Malawi, Niger, Sudan, and Zambia**. RAHC Nairobi provided technical backstopping and project coordination in **Eastern Africa**. A regional operation to address transboundary animal diseases (TADs) was undertaken in the **Great Lakes of Africa (Burundi, Democratic Republic of the Congo, Rwanda)** recently launched in a sub-regional context characterized by past conflicts. Additionally, a sub-regional project supported laboratory capacity to conduct animal disease surveillance and diagnosis by carrying out respective national laboratory assessment in **Burundi, Djibouti, Somalia and South Sudan**. Biosecurity guidelines for safe poultry production, as entry point prevention of HPAI disease spread between poultry and poultry to human in Eastern Africa, have been prepared and workshops took place in **Kenya and Tanzania** to validate these guidelines. Work progressed also to investigate on the role of poultry within the livelihoods and examine the role of vaccination in HPAI to identify effective and sustainable strategies for disease control (**Uganda**).

The Regional Animal Health Centre for **Southern Africa** provided support to the **Southern African Development Community (SADC)** Secretariat in their effort to keep the SADC region free from the infection and coordinated the technical activities under the SADC Avian and Human Preparedness and Response Plan. In close collaboration with the United Nations Office for the Coordination of Humanitarian Affairs (OCHA), the RAHC Gaborone supported the Avian and Human Influenza Platform for Southern Africa and several projects are being put in place to respond to this request. Since the SADC region is still free from the infection, these activities are primarily targeted at prevention and preparedness, but also at strengthening surveillance and diagnostic capacity. Eleven countries will benefit from this approach among which **Malawi, Zambia, Mozambique and Zimbabwe**. Four countries received a Rapid Assessment Mission to prepare the Integrated National Action Plan (INAP) (**Madagascar, Mozambique, Lesotho and Namibia**) and **Malawi and Zambia** had similar assessments done prior to this ALive Initiative.

In West Africa, RAHC Bamako coordinated activities on preparedness and networking complementing a new regional communication strategy designed through a series of workshops, benefiting several countries in the region (**Cape Verde, Guinea Bissau, São Tome & Príncipe, Angola and Mozambique**). This strategy emphasizes on the need to refocus the messages on animal health as the source of potential danger for public health and the launch of a regional communications network (RESOCOM), which would provide the ideal framework for the implementation of communications activities in West and Central Africa. Surveillance is strengthened through the regional networks (West and Central

Africa Epidemic surveillance Network for Avian Influenza and other transboundary animal diseases - RESEPI, the Epidemiology of avian influenza in Africa - EPIAAF, and the West and Central Africa Veterinary Laboratory Network for avian influenza and other transboundary animal diseases - RESOLAB) that actively improve countries early warning and response mechanisms by providing training for technicians of the national veterinary laboratories, exchanging information on the disease control, and rehabilitating veterinary laboratories (**Sierra Leone and Liberia**). The veterinary services' capacity is also enhanced to address the avian influenza threat and other transboundary animal diseases (**Chad, Gabon**).

Additionally, in West Africa socio-economics, production and biodiversity activities have been carried out to assist affected and at-risk countries in the region to develop and implement effective plans for the prevention and control of HPAI that minimize the negative social and economic impacts of disease and control.

Pilot work is being conducted in four countries (**Burkina Faso, Côte d'Ivoire, Ghana and Togo**) focusing on the relation between risks and the structure/organization of the poultry sector, poultry movement and biosecurity at production and market levels as key factors for the control disease spread and the implications of cross-border trade for the benefit of the countries in the region (**Guinea, Gabon, Benin, Chad, Nigeria**).

## Country highlights

### **NIGERIA**

#### *Activities*

Efforts concentrated on the launching of a countrywide active surveillance programme implemented by the ECTAD country team that assist national authorities in the identification of country needs to control HPAI. In particular, field activities are under way to cover all country areas, live-bird markets, and target surveillance on commercial farms. Studies on socioeconomics and wildlife are implemented jointly with UNDP and the World Bank. Procurement of equipment, laboratory consumables and biosafety material has continued to be provided by FAO.

#### *Critical assets*

- The epidemiological origin of the HPAI outbreaks occurred in Nigeria since 2006 remain unknown. Three different viruses were characterised during the outbreaks course that were declared in 14 out of a total of 37 states in the country. Domestic poultry and wild birds were affected.
- The veterinary services capacities are satisfactory and there is a chain of command at federal and state levels for HPAI activities. Reporting methods from the remote rural areas to the centralized offices of National Disease Investigation and Surveillance need to be improved.
- The Preparedness plan is well prepared and covers the components for the prevention and control of the current avian epizootic and potential human pandemic. The plan is principally applied by the Animal Health Sector.
- Passive and active surveillance is conducted routinely through appropriate networks



in the field. Since October 2007, the FAO ECTAD Unit has conducted two live bird market surveillance studies in all 37 states of the country. Continued surveillance of live bird markets and in wild bird nesting areas is planned in order to know the spread and maintenance of the virus in the country.

- The laboratory capacity is good with a well staffed and equipped National Veterinary Research Institute (NRVI at Vom) that is the Regional Laboratory for Central and West African countries. Nigeria has always submitted HPAI samples isolated and confirmed by the NVRI to the OIE/FAO reference laboratory in Padova, Italy.
- Though rumours that vaccination was illegally carried out in some commercial farms, there are at present no such rumours. The government policy still remains not to vaccinate and there is no vaccination strategy available, should the situation become enzootic.
- There is a well established compensation policy programme funded by the World Bank. All sectors (1 to 4) are compensated. Rates of compensation are calculated either by bird type, or use, or age, and genus, such as loss of turkeys is different from cockerels, or layers, etc. The implementation guidelines will soon be revised in collaboration with FAO. However, the last compensation was completed almost two months after the outbreaks, which is hardly sustainable for sector 4 poultry owners.
- Biosecurity in commercial farms follow in-house guidelines which have not been evaluated. It is believed that there is improvement since the outbreak of HPAI in Nigeria in 2006. However, the areas where birds are for the major part scavengers or are on small scale backyard poultry farms there is practically no biosecurity measures in place. Poultry sale and slaughter occur in the same area in close proximity, movement into the market and exit is not controlled. Hygienic handling of the poultry products is not implemented. A new department within the Federal Ministry of Agriculture to deal with movement management of livestock and poultry has been created in January 2008. Cross-border disinfection is implemented to a limited extent. Improvement of live bird markets in structure and capability to disinfect and clean is in the Ministry's programme. This also covers poultry meat processing facilities.
- In spite of the complex poultry industry and husbandry practices in Nigeria, where the majority of the poultry population is in the least managed rural areas, the country has managed to implement modified depopulation and stamping out procedures in line with the FAO/OIE guidelines. The country allowed access to development partners and UN agencies to its programme and to participate in the implementation thereof. Continued collaboration with international bodies and making funds available through World Bank loans and grants, it has so far succeeded in having well grounded teams that can be mobilized quickly in case of an outbreak. It has a stronger surveillance capabilities supported by a very good national laboratory which can respond on time should an outbreak occur. This makes Nigeria capable to prevent and control HPAI.

## **TOGO**

### **Activities**

The Government of Togo and FAO are finalizing a programme funded by the European Commission to strengthen the veterinary services' capacity and address the avian influenza threat and other transboundary animal diseases with the technical and financial support of FAO. A number of outbreaks affecting domestic poultry were reported in the country with no human cases. These outbreaks have been rapidly controlled and since then, the country is free from HPAI. However, high vigilance is needed since all the sub-region countries are at high-risk of infection due to the unknown status Nigeria and virus circulation.

### **Critical assets**

- The capacities of the veterinary services remain fair due to the lack of national funds to finance VS activities and the chain of command is not well functioning from the local to the central level.
- The Preparedness Plan has been validated by national authorities and tested in real time situation and the participation in regional simulation exercises (September 2007) has also helped prepare the country. The Plan has a good communication strategy and compensation policy. The rapid assessment INAP mission conducted on December 2007 helped better identify the Plan weaknesses and reinforce it.
- The EC funded project and CMC-AH activities are to strengthen the surveillance capacity and surveillance teams part of the REMATO (national surveillance network) and to train around 80 agents, equipped and surveillance networks put in place. However, due to the lack of funds, only suspicions are tested for HPAI.
- Though the support from the Padova laboratory, the country has limited diagnostic capacities. RT-PCR capacities have been reinforced to conduct rapid diagnoses.
- Vaccination has never been implemented in Togo and there is no relevant strategy because it is not considered as a priority tool for control.
- There is a well-defined national compensation strategy and compensation has been implemented following the outbreaks.
- The biosecurity level in Togo remains poor.
- The overall prevention and control capacities are good in the country and will be further reinforced following the OIE PVS evaluation conducted in October 2007 and INAP missions. Funds for preparedness and post-crisis activities are needed. Togo efficiently coped with three HPAI outbreaks in 2007 because technical and financial preparedness capacities were provided by African Development Bank and FAO. However, the country capacity to control HPAI needs to be enforced.

## **MIDDLE EAST AND NORTH AFRICA**

Two Regional Animal Health Centres (RAHCs), located in Tunis for North Africa and in Beirut for Middle East, coordinate the programme activities in the region where countries like Egypt still represent an incubator of the disease. In addition, the Middle East and North Africa (MENA) region is at particularly high risk because of the wild bird migrations crossing the territory that increase the risk of infection among domestic poultry and humans. Activi-



ties have been carried out to strengthen disease surveillance and establish sub-regional epidemiological and laboratory networks to build country and regional capacity for HPAI detection and response.

The Regional Animal Health Centre for North Africa (RAHC-NA) launched a series of workshops and two coordination meetings to refine the HPAI regional workplan and develop projects. A coordination protocol for animal health activities was signed between RAHC-NA and the Arab Maghreb Union on March 2008. Additionally, meetings with the African Development Bank allowed strengthening the regional HPAI/animal health platforms in North Africa, the subregional laboratory and surveillance networks, the organization of a compensation and wildlife/HPAI working strategy, and the regional HPAI website and online database. On the basis of the regional activity workplan, RAHC-NA provided training to the veterinary and wildlife services with the goal of improving their surveillance capacity in 9 countries in Maghreb and West Africa. In order to harmonize and upgrade the HPAI surveillance systems and databases of all countries, the TADinfo software is being installed and promoted in Maghreb countries and Egypt. The RAHC-NA has also organized meetings to launch a regional programme for the enhancement of national capacities on communication for the prevention of HPAI, train on, information and transmission of HPAI messages and establish a network of communication focal points in each relevant ministry of the region.

The Regional Animal Health Centre for the Middle East (RAHC Beirut) provides a framework for the coordination and harmonization of strategies, monitoring and control of Avian Influenza and other TADs in the region. The Centre supported Middle East countries in preparing and reviewing national contingency plans for the prevention of Avian Influenza; also, it provided the necessary technical measurements and precautions to be taken when the infection occurs and how the veterinary services should respond (Syria, Iran, Jordan, Saudi Arabia and Bahrain). Projects are being prepared by RAHC Beirut in close collaboration with the Ministries of Agriculture of Syria, Jordan, Yemen and Lebanon for the prevention and control of Avian Influenza, strengthening national laboratories capabilities, biosecurity measures, and surveillance.

Training sessions and study tours took place in the region aiming to strengthen the capacity of national laboratory's personnel in using PCR reagents and to build the capacity of the national staff in surveillance and epidemiological investigations. National laboratories were also supported and rehabilitated through the provision of equipment, manuals on wild birds and Avian Influenza (Yemen, Mauritania, Djibouti, West Bank and the Gaza Strip).

A series of workshops have been undertaken in the region to assist the countries in the decision making process regarding priorities to be given to the veterinary services, and in the risk analysis in international trade in animals and animal driven products. Training was provided to the veterinary services to enhance their capacity in emergency response for TADs (and particularly HPAI) and the effectiveness of the countries contingency plans. Additionally, workshops were conducted to harmonize national plans for emergency preparedness and control of Avian Influenza and other epizootic diseases, including surveillance of wild birds and domestic birds of prey and develop a regional control strategy for the disease (Djibouti, West Bank and Gaza Strip, Mauritania, Jordan, Kuwait, Lebanon).

Public awareness campaign was conducted, geared towards backyard farmers, small scale poultry farmers, large scale farmers and breeders, and the general public. Specific messages were prepared for each group, and were spread using radio and TV spots, posters, leaflets, newspapers and a documentary DVD (West Bank and Gaza Strip).

Following December 2007 outbreak and under the request of the Kingdom of Saudi Arabia, the FAO Crisis Management Centre – Animal Health (CMC-AH) fielded a rapid deployment team (RDT) to mainly assess the present situation of the HPAI outbreaks in the country but also to provide recommendations for strengthening the existing HPAI control strategy and stopping the spread of the disease including evaluation of the implementation of vaccination. A proposal for the support of KSA veterinary services was submitted, approved and will be implemented shortly.

## Country Highlights

### **EGYPT**

#### *Activities*

Since 2006, HPAI outbreaks have been reported regularly in Egypt in domestic poultry and wild birds. The country situation is considered enzootic for H5N1 HPAI with fatal human cases. Due to the continuous spread of HPAI in Egypt, presently over 23 out of the 29 governorates, FAO has set up a dedicated ECTAD country team assisting the national authorities in identifying country needs and implementing activities at local and national level. The support for epidemiological surveillance and improvement of biosecurity production systems at district and governorate levels is on-going and FAO has supported the establishment of an epidemiology unit within the General Organization for Veterinary Services (GOVS) of the Ministry of Agriculture. This approach would enable the establishment of local disease management systems in the five most affected governorates in the Delta region. The ECTAD team is also assisting the Government in formulating project proposals in addition to the two national and three regional/inter-regional AI projects and the FAO Technical Cooperation Project (TCP) for Foot and Mouth Disease that are in implementation.

An active and passive surveillance plan has been elaborated by FAO consultants and adopted by GOVSs.

Since March 2007, FAO has been supporting the Minister of Agriculture to formulate a comprehensive compensation strategy for avian influenza that is needed in the country. Bio security is a key issue in animal health control and consultancies have taken place dealing with this issue and with value chain analyses to assess risk in the market systems. An FAO-WFP study investigating the impact of the disease in four governorates was undertaken. The preliminary results have shown that smallholder producers are facing severe problems in rebuilding their poultry flocks and a report related to this study has been produced in Arabic and English languages and is being distributed to all concerned parties within the country.

#### *Critical assets*

- The capacity of the veterinary services remains poor.

- The federal structure requires a specific mechanism for the chain of command to be fully operational both ways. As for now, such a mechanism has not been established yet and the chain of command is poorly developed. The Governorates wield great control in implementation of activities and in allowing for information flow to central levels. The poultry research laboratory (which carries out diagnostic services) is not part of the veterinary services.
- The Preparedness Plan exists but has not been officially validated or tested. It is unpractical as it is not based on current information, latest epidemiology situation developments and risk assessment. Also, it does not propose practically implemented disease control response interventions. The two major bottle-necks are the absence of funding for compensation and the lack of institutional coordination. No current improvement or updating of the Plan is currently envisaged. As a result of all these weaknesses, the authorities do not adhere to the Plan.
- Overall prevention capacities are insufficient. Knowledge of the poultry sector in the epidemiology units is limited, and hampering the ability of national technical staff to make recommendations for HPAI control. This situation creates difficulties in advising key policy decision makers in the Government. To address this, a live bird market survey has been launched; pilot activities have been completed recently, and a country-wide scheme is about to start, based on the pilot results.
- The absence of risk analysis does not allow targeting specific populations. Much wild bird surveillance has been undertaken by the Ministry of Environment, with testing conducted by the US' Naval Medical Research Unit in Cairo (beginning in 2004), but results are not shared with the Ministry of Agriculture and Land Reclamation (MoALR).
- The Research Poultry Laboratory is well functioning and able to perform all necessary AI diagnostic analyses. Access to international laboratories for final confirmation is provided, directly and indirectly through FAO and alternative means.
- Control capacities are insufficient and result in poorly implemented response measures, lack of coordination, management, monitoring and response infrastructure. Control measures are not implemented according to existing legal measures and regulations.
- Vaccination is implemented haphazardly and is the major tool used to control the disease. The vaccination strategy is targeting specifically sector 4, is government subsidised and is scheduled twice a year (in principle). It is expected to have a high coverage rate. However there is no vaccination monitoring and the real current coverage rate is unknown. Commercial sector self-manages and finances its own vaccinations, using varying coverage and dosage schedules.
- There is no compensation scheme/policy, resulting in an almost complete absence of reporting. The lack of compensation is hampering surveillance and disease control measures. It is a priority that a decision to re-introduce an effective compensation policy is taken as soon as possible.
- Biosecurity are quasi inexistent, though there are some Sector 1 facilities that would be considered high. Yet, at least one Sector 1 facility is known to have yielded to H5N1 entry. No activities are currently implemented to improve biosecurity measures

in other sectors, though awareness material is available. Compartmentalization schemes are being submitted to the government for consideration in order to resume export to other countries.

- Egypt situation with regard to HPAI prevention, and most of all control, remains a real concern. Not only capacities and capabilities are insufficient (human resources, financial, technical), but the needed shift to a more reactive response (revision of the Plan, revision and monitoring of the vaccination strategy, etc) seems to be hampered by an insufficient political willingness. Re-structuring of the veterinary services is a necessity. Support from the international communities is therefore crucial to maintain lobbying for important control measures and strengthen central and local capacities.

### CENTRAL ASIA

FAO provides technical assistance to combat HPAI in ten countries in Central Asia: Afghanistan, Azerbaijan, Iran, Kazakhstan, Kyrgyzstan, Pakistan, Tajikistan, Turkey, Turkmenistan and Uzbekistan. The Central Asia Regional Network (CARN) is a common platform for these countries to share experiences in the control of HPAI, data and information at international level, and to become familiar with the laboratory diagnostic techniques. Also, the projects that have supported the CARN provide equipment, reagents and supplies to assist the beneficiary countries in enhancing their diagnostic services on poultry diseases, and possibly attract poultry owners to benefit from those services (which in turn should improve early detection of HPAI should this occur).

In most of the countries where there have been reported outbreaks, the disease has been sufficiently and rapidly eliminated (**Turkey, Afghanistan, Iran, Azerbaijan, Kazakhstan**). The only country in the region where the HPAI virus has been continuously reported over the last two years is Pakistan.

A number of projects are in implementation in the region with the aim of supporting a national plan to develop and implement HPAI prevention, containment and control as well as eradication activities. Within its framework, a national action plan (including a contingency plan) and standard operating procedures on laboratory diagnosis, disease control and disease surveillance are developed. Monitoring activities and collection of samples at the district level are carried out in collaboration with the local veterinary services/associations and data for the establishment of a database on poultry population are being collected.

Training for countries staff was one of the major activities undertaken to enhance the regional capacity of the laboratories and the veterinary services to respond to HPAI incursions. One training programme, two regional workshops and a number of national training activities have been carried out specifically on: a) serological and virology techniques for avian influenza laboratory diagnosis according to the FAO/OIE/EU guidelines; b) epidemiology of infectious diseases; c) implementation of surveys, monitoring and surveillance programmes in their respective countries; and d) vaccination strategies. The countries that benefited of these trainings were Afghanistan, Azerbaijan, Iran, Kyrgyzstan, Mongolia, Pakistan, Tajikistan, Turkey, Turkmenistan and Uzbekistan. Particular training sessions were conducted in Tajikistan, Azerbaijan, Iran, Kyrgyzstan and Pakistan within the Training of Trainees (ToT) programme to enhance the local capacity of human resources.

Considerable efforts have been made to upgrade and equip the HPAI laboratories in six beneficiary project countries, particularly in Afghanistan, Azerbaijan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan. Additionally, a package of laboratory diagnostic reagents and consumables has been also procured for nine countries (Afghanistan, Azerbaijan, Iran, Kazakhstan, Kyrgyzstan, Pakistan, Tajikistan, Turkmenistan and Uzbekistan).

In addition, technical assistance was provided by FAO to develop National Work Plans and to install and deploy TADinfo epidemiological tools that have been developed by FAO Animal Health Service for **Kyrgyzstan** and **Tajikistan**, and how this tool facilitates the veterinary services monitoring and reporting of the diseases.

In order to provide strong and continuing support to the countries, backstopping and needs assessment missions have been conducted in almost all the countries of the Regional Network in Central Asia.

A set of activities have been prioritized in the region that include the identification of a lead regional laboratory and the assessment of ways and means to designate it as Regional Centre of Excellence. Workshops are also pipelined encompassing communication strategies, wildlife surveillance, preparation of contingency plans and socio-economic issues. Table-top and field simulation exercises as well as training workshops on PCR testing and laboratory diagnosis are envisaged and will be conducted next year.

In this region, particular attention is devoted to **Pakistan** that is affected from persistent and endemic HPAI. Apart from numerous outbreaks in poultry, there were human fatalities, also in 2008. Regular surveillance and investigation is being carried out in the affected areas of Karachi, FATA, Islamabad, Peshwar and Abbotabad in NWFP (North West Frontier Province). In order to facilitate the national surveillance programme, diagnostic reagents and kits, samples collection, laboratory tools and consumables items are being provided regularly not only to the Provincial Laboratories but as well to the Central National Reference Laboratory. FAO provided technical assistance also to the National Programme for AI Control in developing a communication plan, awareness campaign, literature for print and electronic media in collaboration with UNICEF and the Ministry of Health.

## EUROPE AND CAUCASUS

This region covers 12 countries: Albania, Armenia, Belarus, Bosnia and Herzegovina, Croatia, Georgia, Kosovo, Macedonia, Moldova, Montenegro, Serbia, and Ukraine. The core of FAO contribution in these countries has been technical assistance, especially training courses for local veterinary services in disease diagnosis and modern diagnostic techniques, epidemiological analysis of outbreak data and surveillance in poultry and wild birds, and promoting countries' participation in regional networks. The poultry sector of these regions, apart from several exceptions, mainly consists of backyard poultry, and in certain areas free ranging ducks and geese are very common. Taking into consideration that the major risk of introduction of HPAI is through wildlife and the easiest local spread of the disease is through the backyard poultry, FAO has concentrated its major efforts in these two fields. On the other hand, the few commercial poultry farms that exist in this region have already adopted efficient surveillance models, easy to apply, since their production structure is very similar to the one in the developed Western Europe countries. The real problem encountered in Eastern Europe and Caucasus region is the surveillance in the backyard poultry sector that in certain

countries characterizes up to 90 percent of the whole poultry production. The backyard poultry generates income at family level and the standard procedure used for controlling HPAI (stamping out, compensation policy, etc) are not always accepted by the families. In most of the cases, the population growing backyard poultry cannot be assisted by the veterinary services since they themselves have weak capacity and lack of funds.

Several technical and needs assessment missions were carried out in the countries of Eastern Europe (**Belarus** and **Ukraine**) and are planned for **Moldova**. FAO experts coordinated field missions together with partner international organizations (World Bank, WHO, UNICEF and UNDP).

The National Work Plans are developed by the FAO HPAI National Veterinarians in close collaboration with the Chief Veterinary Officers of the countries and a model of designing the Plans was prepared by ECTAD staff. The countries developed and submitted their HPAI six-month plans which are currently being implemented and led by the FAO National Veterinarian in each respective country.

Capacity building through training courses and workshops has been conducted addressing various facets of avian influenza and other transboundary animal disease control (epidemiology ToT training on outbreak investigation in **Armenia**; laboratory differential diagnosis of the main poultry diseases in **Georgia**; contingency planning and standard operating procedures (SOPs) in **Bosnia** and **Herzegovina**)

Wildlife surveillance and surveillance models through sentinel for backyard poultry were developed in **Serbia** and **Macedonia**. Epidemiological studies through GIS were undertaken in the same countries and several manuals and public awareness materials were also prepared and printed. An integrated desk-top simulation exercise on animal and human population benefited **Albania**. Whenever possible, FAO provided assistance and facilitated the participation of national experts to regional and international workshops, laboratory trainings, conferences and meetings.

## LATIN AMERICA AND THE CARIBBEAN

Activities have been executed in the region in close collaboration with international organizations including OIE, the International Regional Organization for Animal Health and Plant Protection (OIRSA), the Inter-American Institute for Cooperation on Agriculture (IICA), the Caribbean Community and Common Market (CARICOM), the Pan American Health Organization (PAHO), Andean Nations Community (CAN) and USDA.

In December 21, 2007, the Dominican Republic Government reported two outbreaks of H5N2 Low Pathogenic Avian Influenza (LPAI) to OIE (in Santo Domingo and La Altagracia), which were detected on 10 December 2007. The main problem of this strain is that birds infected had no visible sign of infection, and its mutation to H5N2 High Pathogenic Strain is possible, with mortality of more than 80 percent. For this reason, Haiti established an embargo against the importation of all poultry products from the Dominican Republic, including eggs, creating a growing tension between both countries persisting until today.

On government's request, FAO provided technical assistance by sending a mission in Dominican Republic. Further on, FAO fielded another mission in Haiti at the end of which the experts elaborated an executive summary report that was distributed to the authorities in both countries Dominican Republic and Haiti.

There has been substantial procurement for diagnosis purposes aimed for the laboratories in the region as well as sampling and surveillance equipment.

Until today, the risk that LPAI - H5N2 virus enters to Haiti from Dominican Republic is highly possible. The main reason is informal trade of poultry and poultry products at the frontier, despite the relatively low traffic of fighting cocks from Dominican Republic to Haiti.

The health impact of such outbreak of LPAI - H5N2 depends heavily on the possibility that the virus changes to a highly pathogenic virus. As long as it keeps its low pathogenic and does not enter the incipient productive sector, it should spread slowly, but at the same time it will be more difficult to detect at an early stage and to implement control and eradication measures.

Before the Dominican Republic outbreak the H5N2 Low Pathogenic Avian Influenza was present only in USA, Mexico, Guatemala and El Salvador.



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## Conclusion

Almost five years have passed since HPAI first emerged as a serious global problem. FAO together with its partners has continued to increase its experience with developing various control strategies and approaches in the light of improving information about the disease and its epidemiology, results of research, and feedback from the field. This increasing knowledge has been applied to regularly refine the FAO/OIE Global Strategy which outlines the global, regional and national responsibilities of both organizations to help governments combat the HPAI epidemic. To meet these responsibilities, FAO structured a three-year Global Programme (2006-2008) to operate simultaneously on the global, regional and national level.

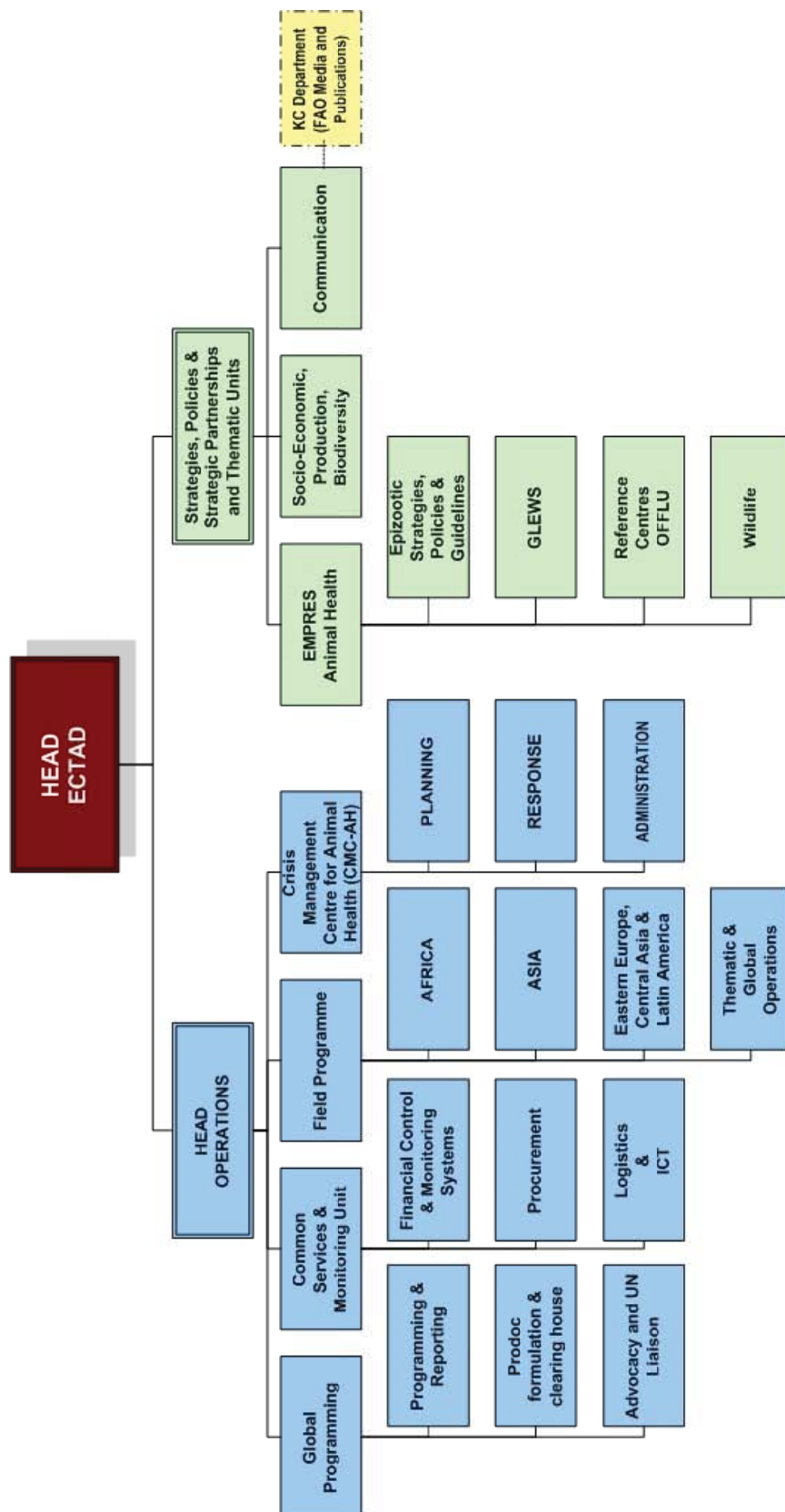
Since the inception of its Global Programme almost three years ago, FAO has found that national capacities to prevent and respond to HPAI are continuously improving in many countries. The infection has been eliminated from a number of infected or re-infected countries, demonstrating the importance increased preparedness and response capacity. However, despite the continuing improvement of the disease situation and progress made, global control of HPAI presents particular challenges in controlling infection particularly in hotspots where the virus continue to circulate actively and in countries where it has become entrenched or enzootic in poultry. The veterinary services of many countries do not yet have the capacities required to deal with the HPAI threat and lack the strong involvement of private producers and other stakeholders or the resources that are needed to mount effective prevention and control programmes. Moreover, knowledge gaps persist involving factors critical to the success of global HPAI control.

Additional funds are necessary to continue assisting countries and sustain achievements made to date. FAO, together with OIE and other partners, is committed to long-term assistance to secure the control and eradication of the disease at its source and to protect animal and human health and vulnerable livelihoods with the ultimate goal of avoiding a human pandemic. FAO is also committed to global efforts to ensure better preparedness for the challenges from the emergence of major animal health crises, in line with the newly developed strategy based on the concept of "One World-One Health".



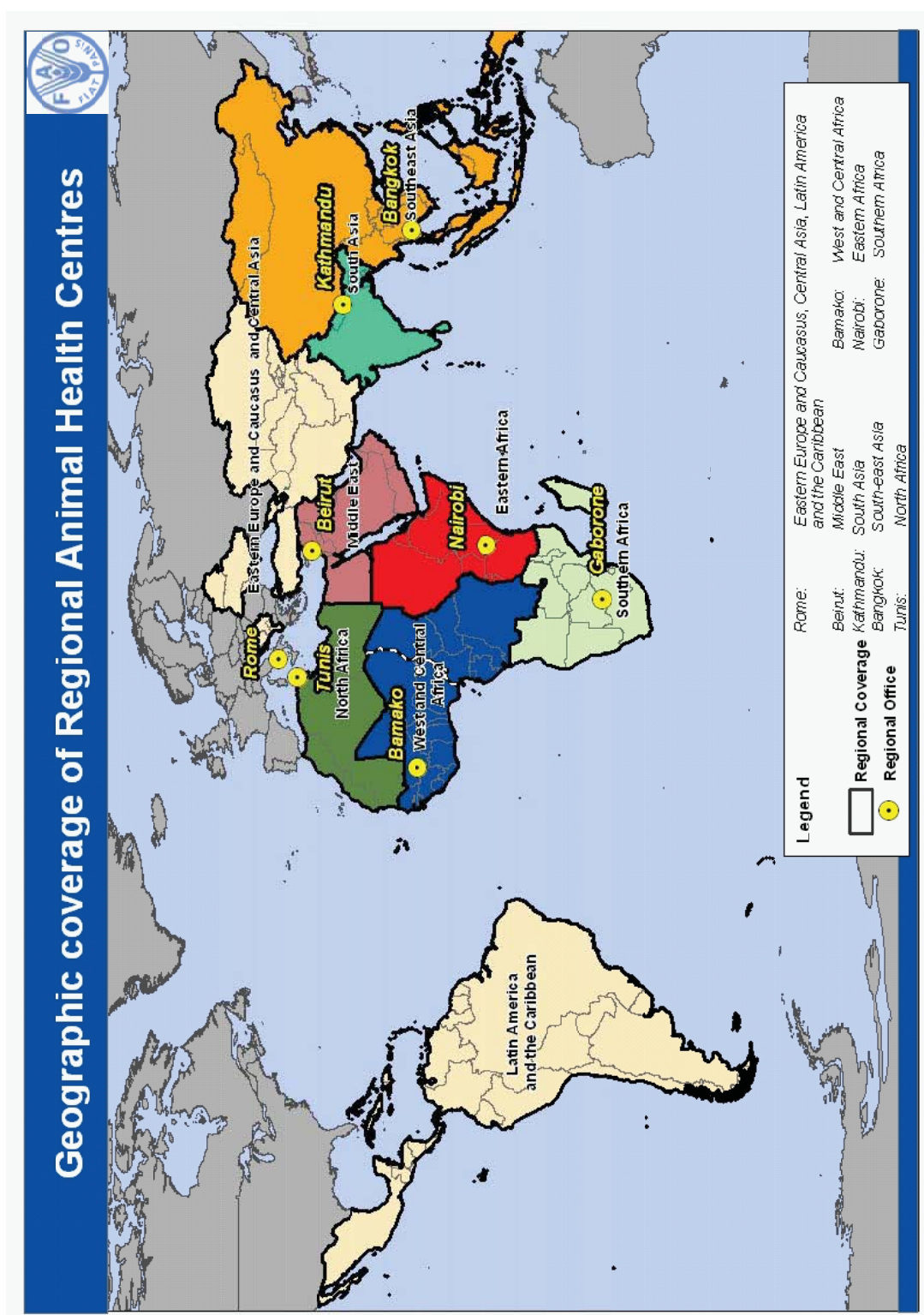
# Annex 1

## ECTAD structure



## Annex 2

# Geographic coverage of Regional Animal Health Centres



## Annex 3

## List of Countries Interviewed

Sub-Saharan Africa	South and South East- Asia	Central Asia	North Africa and Middle East	Eastern Europe and Caucasus
Benin	Bangladesh	Iran	Egypt	Armenia
Botswana	Bhutan	Kyrgyzstan	Jordan	Azerbaijan
Burkina Faso	Cambodia	Pakistan	Lebanon	Bosnia and Herzegovina
Cameroon	China	Tajikistan	Mauritania	Georgia
Chad	India	Turkey	Yemen	Kosovo
Cote d'Ivoire	Indonesia	Turkmenistan		Macedonia
Congo, Dem Rep. of	Laos			Serbia
Gabon	Maldives			
Ghana	Myanmar			
Kenya	Nepal			
Lesotho	Sri Lanka			
Liberia	Timor-Leste			
Madagascar	Viet Nam			
Mali				
Mozambique				
Niger				
Nigeria				
Sierra Leone				
Sudan				
Tanzania				
Togo				
Uganda				
Zambia				
23	13	6	5	7

