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A. ABDELLATIF

PDS activities in North Kordofan, the Sudan

Participatory Disease Surveillance in the Republic of Sudan as of August 2007

Participatory Disease Surveillance (PDS), the active surveillance tool for AI viruses, was a key activity under the FAO Project OSRO/SUD/624/CHF in the Sudan in 2007. Surveillance activities were undertaken in backyard systems, in commercial farms and in wild birds in the country.

A new variant of porcine reproductive and respiratory syndrome (PRRS)

Recent reports from the China and Southeast Asia have alerted the world to a new variant of the PRRS virus. The disease produced by this virus is characterized by high morbidity and significant mortality that has devastated the pig industries of the affected countries.

J. ANNELI

Pigs on a suspect PRRS farm, Viet Nam

AND...

FAO in action

FAO strengthens actions on early detection and prevention of highly pathogenic avian influenza (H5N1 HPAI) in Latin America and the Caribbean. FAO initiatives to strengthen the capacities for prevention, detection and control of HPAI in 33 countries of Latin America and the Caribbean (LAC), have shown substantial results. These were presented during the Sub-regional Projects Conclusion meeting held in Santiago, Chile, 30–31 October 2007.

Presidium opening ceremony, Santiago, Chile

R. CAMPUZANO

This issue covers the period August to December 2007

FAO Animal Production and Health Division

Participatory disease surveillance in the Republic of Sudan – as of August 2007

Introduction

Highly pathogenic avian influenza (HPAI) H5N1 severely affected poultry production in the Republic of Sudan in 2006. The first outbreak was confirmed in the northern part of the Sudan in April 2006 in commercial farms in River Nile, Khartoum and El Jezira States where it had a considerable socio-economic impact. The disease was confirmed in the southern part of the Sudan in August 2006 in backyard systems in Central Equatoria State. Control measures were put in place to prevent the spread of infection and to eliminate the disease: a total of 107,327[1] poultry were culled; quarantine measures were applied; and disease surveillance was carried out.

A. AWAD

AI awareness raising, the Sudan

It is hypothesized that the virus may have entered the Sudan through trade in poultry and poultry products (probably through the main international airport in Khartoum and then spreading inside the country, again through poultry trade internally), but this has not been proven and additional work is needed.

Under the FAO project (OSRO/SUD/624/CHF), FAO provided funds to the Federal Ministry of Animal Resources and Fisheries, the Republic of Sudan to support the detection and control of avian influenza (AI) outbreaks and to mitigate the consequences of the disease on animal production and the risk to human health.

Participatory Disease Surveillance (PDS) was used as an active surveillance tool for avian influenza viruses in domestic backyard poultry-production systems in high- and moderate-risk states, while surveillance activities were conducted in backyard systems, commercial farms and on wild birds in both the Northern and Southern Sudan.

In this paper the Northern Sudan covers Blue Nile, Northern, Sennar, North Kordofan, Red Sea, River Nile, South Darfour, South Kordofan and White Nile areas and the Southern Sudan covers Jonglei Warrap, Western Bahr El Ghazhal and Upper Nile areas.

HPAI disease awareness in the Sudan

The disease was unknown to most of the informants interviewed in both the Northern and Southern Sudan. When asked to give the five most important poultry diseases in their local traditional name, HPAI was not mentioned and informants did not even know how to describe a case of HPAI. There were exceptions – some informants had never encountered the disease but were aware of it from radio or television reports when HPAI outbreaks had occurred in the Sudan itself (in particular, in Khartoum farms and Juba backyard shelters) or in other countries.

[1] Available at: http://www.oie.int/wahid-rod/reports/en_fup_0000006515_20071125_192657.pdf

Methodology

- **Participatory Disease Search (PDS)** activities in the backyard system covered 13 states (9 in the north and 4 in the south). The objectives were to:
  - search for clinical cases of HPAI, indicating circulation of the virus in the backyard system;
  - collect 35–50 serum samples from households in selected villages in targeted high- and moderate-risk states;
  - create awareness among poultry owners and households about poultry diseases in general and HPAI in particular;
  - collect baseline poultry data.
- Surveillance activities in commercial farms focused on finding cases according to a case definition of HPAI. No active cases were found, so no further investigations were carried out, and no quarantine or control measures were imposed. Sera were collected from non-vaccinated flocks in order to detect antibodies indicative of natural exposure to the AI virus.
- The same exercise was applied to vaccinated farms where sentinel flocks were already included in the vaccination programme of the farm to differentiate antibodies because of vaccination from those owing to natural exposure to the AI virus. Vaccinated farms that did not have sentinel flocks were surveyed but

Figure 1: PDS activity in the Sudan, 2007

Source: S. De Lorenzo, FAO-EMPRES


A. AWAD

Serum sampling of backyard poultry, South Kordofan, the Sudan

were not sampled. However, sera from vaccinated poultry were collected for post-vaccination monitoring.

- Wild bird surveillance was carried out in only two states (Sennar and Blue Nile in the Northern Sudan). The total number of samples collected from wild birds was 80 faecal, 51 cloacal and 52 tracheal swabs. The samples were kept in liquid nitrogen prior to and during transport to the Central Veterinary Research Laboratory (CVRL) in Soba, Khartoum for testing. Testing entailed:
  - capture of resident and migratory birds for sample collection (cloacal and tracheal swaps) for virus isolation;
  - identification of resident and migratory birds to understand their role in the transmission of the HPAI virus to domestic poultry.

PDS activities were conducted during May–June 2007 in the Northern Sudan and in August 2007 in the Southern Sudan. Prior to this, training workshops had been held in Khartoum in April 2007 and in Juba in June 2007.


A. ABDELLATIF

Sampling of wild bird, North Kordofan, the Sudan

PRA tools used in PDS

The workshops also identified the following Participatory Rural Appraisal (PRA) tools as suitable for this study:

- semi-structured interviews to obtain details of management and disease problems;
- simple ranking of diseases, to indicate the relative importance of different conditions that affect poultry;
- pair-wise ranking to show the relative importance of diseases – which one is more important than another (to give indicators for matrix ranking);
- matrix ranking to compare signs and causes of different diseases, e.g. can respondents differentiate between AI and newcastle disease (ND);
- proportional piling to identify the relative importance of different diseases, relative mortality and morbidity from main diseases;
- timeline to identify patterns and trends in disease outbreaks over time;
- seasonal calendar – seasonality of diseases.

These PRA tools were complemented by direct observation of the poultry and their environment, clinical examination of sick birds and sample collection from clinical cases of HPAI-like disease.

Surveillance activities in the Southern Sudan

As noted above, before embarking on HPAI PDS activities, training workshops were conducted in Khartoum in April 2007 and in June 2007. Organized by the Federal Ministry of Animal Resources and Fisheries in collaboration with FAO, these trained

16 participants. The objectives of the workshops were to teach the key principles and skills necessary to mount effective surveillance in backyard poultry and methods for conducting surveys in poultry and wild birds by trapping and sample collection (cloacal and tracheal swabs).

The PRA tools listed above were complemented by direct observation of the poultry and their environment, clinical examination of sick birds and sample collection from clinical cases of HPAI-like diseases.

PDS activities in the Southern Sudan began in the period from 21-27 August 2007 and were conducted by four pairs of two veterinarians in different locations across four states (Jonglei, Warrap, Western Bahr El Ghazal and Upper Nile). Sixty-seven interviews in 199 households were conducted with 349 informants (all poultry-keepers) covering most of the geographical areas. Depending on informants' responses, some or all of the following methods were used: semi-structured interviews; disease ranking; observations and proportional piling.

The surveillance activities aimed to answer several questions to help the Ministry of Animal Resources and Fisheries (MARF), Government of the Southern Sudan to develop appropriate control measures. Questions included:

- Is HPAI still present in Upper Nile, Jonglei, Western Bahr El Ghazal and Warrap States?
- What has been the timeline of its occurrence over the last year?
- Has Newcastle disease been present during the last year?
- Can poultry owners tell the difference between HPAI and Newcastle disease?

PDS activities in South Kordofan, the Sudan

A. ELTAYEB

Poultry management

The poultry-keeping system in the Southern Sudan is free-range: birds move without restrictions. Direct observations in the four southern states revealed that women and children run the poultry business without men's involvement. This may stem from cultural practices where men look after the "big business", leaving poultry-keeping to the rest of the family. Chickens are the most commonly kept species, followed by pigeons and ducks. The number of birds kept per household is small – usually ranging from 1 to 30, with an average flock size of 17 chickens, 16 ducks, and 27 pigeons. Ducks and chickens were usually housed together and there was easy and frequent contact with birds kept by neighbours. Birds were allowed to scavenge but were supplemented with grains (*dura*, *simsim*), leftovers from household meals and brewing by-products. Some poultry are given drinking water.

Results: the Southern Sudan

Most respondents said that HPAI had not been seen in the area. Moreover, as noted above, when asked to mention the most fatal disease for poultry, they rarely mentioned HPAI. However, some informants still feared that HPAI could occur at any time because they believe that many chickens and eggs are brought from neighbouring countries (i.e. Uganda). Informants were unaware that Uganda is not affected by HPAI and indeed some traders imported eggs and chickens from Khartoum. In addition, when open-ended questions were asked, respondents did not mention the case definition of HPAI. This was considered an indication that the disease had not been seen physically by the informants, but had been heard about only over the radio or television.

Most informants, for instance, in Jonglei State knew nothing about HPAI, barring three informants who had heard of it on the radio during their stay in Khartoum, Kampalla and the Nuba Mountains. Intensive awareness-raising campaigns about the implications and case definitions of AI and HPAI are necessary to educate poultry-keepers.

Newcastle disease, fowl pox, external and internal parasites had been very common over the previous six months and had been occurring regularly for many years in the Southern Sudan, and were the most important disease problems relative to others. Informants did not describe any new disease syndrome that had appeared in the previous six months. However, the level of local knowledge of poultry diseases in general was low. Informants did not describe disease syndromes in detail so it is unlikely that they would be able to differentiate between Newcastle disease and HPAI if both were present.

Main problems

Most informants listed several problems facing poultry-keeping:

- lack of drugs and vaccines;
- lack of veterinary extension services;
- predators (i.e. cats, eagles …);
- quarrels between neighbours;
- diseases;
- free-range birds disturbing neighbours, creating conflict, people throwing stones at birds, etc.;
- poultry housing destroyed by rain;
- lack of knowledge of poultry nutrition;
- lack of labour;
- lack of water provision;
- low hatch rates;
- birds making the house dirty;
- thefts of live birds.

It became clear that most cattle keepers were not familiar with poultry diseases. However, a good number of informants mentioned some poultry diseases (in their local language). The local names were translated into scientific terms to illustrate the purpose of the task. Table 1 shows the diseases listed by informants in three states.

Table 1: List of poultry diseases as presented by informants across three states

A) LIST OF POULTRY DISEASES AS PRESENTED BY INFORMANTS IN THE WESTERN BAHR EL GHAZAL TRIBES ETHNIC GROUP

English name	Local name	Traditional case definition
Newcastle disease	Malaaj, Abuloj, Yaj, Jamo, Isehal, Nok	Diarrhoea, nasal discharge, salivation, rough feathers and death
Fowl pox	Umboulo, Goula, Wong ajith, Yentok and Jederi	Small nodules around the head, eye, mouth, comb, wattle and death among the chicks
Lice and mites	Ngoall, Leing, Comol	Itching, restless, rough feathers, anaemia and drop in production
Marek's disease	Mol, Madong, Abu Egial	Paralysis of wing, legs and neck and death
Internal parasites	Shia, Doud	Drop in body weight and production, bloody diarrhoea
Respiratory disease	Dikaro, Umshegae and Cough	Cough, sneezing, nasal discharges, difficult breathing and death

B) LIST OF POULTRY DISEASES AS PRESENTED BY INFORMANTS IN THE WARRAP TRIBES ETHNIC GROUP

English name	Local name	Traditional case definition
Newcastle disease	Malac, Apalac Mangok	Greenish diarrhoea, dullness, ruffled feathers, high mortality
Infections rhinotracheitis	Nok	Asphyxia, rales, death at night, high mortality
Mite	Nyok	Small mites under wings, itching, emaciation, defeathering
Lice	Liny	Small lice under wings, itching, defeathering, emaciation
Fowl pox	Nyntouk	Small nodules around mouth and wounds

C) LIST OF POULTRY DISEASES AS PRESENTED BY INFORMANTS IN THE JONGLEI TRIBES ETHNIC GROUP

English name	Local name	Traditional case definition
Newcastle disease	Jong-Ajith	Greenish diarrhoea, dullness, ruffle feather, high mortality
External parasites (mites and lice)	Gat/Liny	Itching, swollen eyes, emaciation, loss of appetite, weight loss
Internal parasites	Yach	Diarrhoea (bloody, whitish and yellowish) loss of appetite, weight loss
Chronic respiratory disease (infectious bronchitis, infectious laringotracheitis)	Atiem	Coughing, nasal discharge, difficulty in breathing and death
Gumboro	Jong Yol	Whitish diarrhoea, inflamed vents (bursa of fabricious) and death

Current clinical cases

During PDS surveys in the high-risk states, the investigating teams did not encounter clinical cases of HPAI or HPAI-like diseases. However, they did find that external and internal parasites complicated poultry health conditions, resulting in poor hatching and egg production. In addition, there was no proper feeding, which contributed to the deterioration of poultry-keeping for subsistence purposes.

A. MOHAMMED

PDS activities in the Sudan

Proportional piling – relative importance of common diseases

When informants in Western Bahr el Ghazal State were asked to score relatively important or common diseases, fowl pox was ranked the highest over other diseases, representing 26.9%, followed by Newcastle disease (21.4%), fowl cholera (21.1%) and lice and mites (14.3%). When informants in Warrap, Upper Nile and Jonglei States were asked to name the five most important poultry diseases, Newcastle disease was reported to be the main cause of threat to poultry. Other diseases (e.g. external and internal parasites, gumboro and infectious rhinotracheitis) scored lower. Informants did not mention HPAI when probed. This might be attributed to insufficient community experience and also a lack of awareness campaigns informing the community about the threat that HPAI poses.

A. ABDELATIF

PDS activities in North Kordofan, the Sudan

Surveillance activities in the Northern Sudan

A workshop conducted from 17–19 April 2007 trained 26 veterinarians in PDS. The survey was conducted during May–June 2007 and the duration of field work for each team varied between 7 and 10 days. Samples collected were submitted to the CVRL in Khartoum and were tested with AI rapid test for AI Type A and those which were positive were subjected to ELISA test for H5.

Nine states (Blue Nile, Northern, North Kordofan, Red Sea, River Nile, Sennar, South Darfour, South Kordofan and White Nile) were surveyed and 26 localities were covered.

Results: the Northern Sudan

Current poultry disease problems in flock

In the overall area surveyed, infestation with external parasites (26.46%) was the most prevalent problem followed by Newcastle disease (25.11%), chronic respiratory disease (CRD) (12.78%), salmonellosis (11.56%), fowl pox (6.50%) and others.

Newcastle disease was more prevalent in Blue Nile, Red Sea and Sennar States while CRD was prevalent in North Kordofan, North and South Darfur States. The problem of external parasites was mentioned in all the states, excepting South Darfur. Salmonellosis was more prevalent in White Nile State where cannibalism emerged.

Poultry markets in the Northern Sudan

There were no identified live-bird markets for poultry; however, specific areas were known where poultry were sold and bought without control and supervision, together with other traditional commodities. Chickens dominated the transactions and were mainly local breeds, although in White Nile and Sennar States there were some people who were engaged in selling foreign breeds to those in the backyard system.

Table 2: AI surveillance samples results: Nine states from the Northern Sudan

State	Activity	Sample type	Number of samples	Number of positive			
				Type A	Percent positive	H5	Percent positive
Northern	PDS	Serum	46	11	23.9	1	2.2
White Nile	PDS	Serum	60	16	26.7	4	6.7
Blue Nile	PDS	Serum	50	33	66.0	0	0
Sennar	PDS	Serum	57	11	19.3	1	1.8
Red Sea	PDS	Serum	50	13	26.0	-	-
South Kordofan	PDS	Serum	38	14	36.8	-	-
North Kordofan	PDS	Serum	51	17	33.3	2	3.9
South Darfour	PDS	Serum	50	4	8.0	1	2.0
River Nile	Commercial		429	55	12.8	13	3.0
Total			**831**	**174**			
Wild birds surveillance: Faecal and tracheal swabs tested against Type A antigen							
Blue Nile	Wild bird	Faecal sample	80	74	92.5	0	0
		Tracheal swab	31	0	0	0	0
		Cloacal swab	29	0	0	0	0
Sennar	Wild bird	Tracheal swab	22	0	0	0	0
		Cloacal swab	21	2	9.5	0	0
Total			**183**	**76**		**0**	**0**

Table 3: Results of tests carried out on sera from the three infected states in the Northern Sudan

State	Number of farms	Number of samples tested	Number of positive Type A	Percent of positive Type A
River Nile	476	429	55	12.8
Gezira	52	698	106	15.2
Khartoum	86	1373	164	11.9
Total	**614**	**2500**	**325**	**13.0**

Several facts emerged from the Northern Sudan results. Blue Nile State has the highest percentage of Type A positive, followed by South Kordofan and finally by North Kordofan. North Kordofan State is second to White Nile State in terms of the percentage of positive H5 results. Because of limited available funds, interpretation of these results is problematic: while they indicate that there has been exposure to the HPAI virus, they do not indicate to what extent the virus might still be in circulation.

Recommendations: the Sudan overall

- Additional data are needed, especially on the dynamics of the poultry business (importers and domestic brokers), with a focus on the market chain to determine the probable path of the HPAI virus into the Sudan. More data from the Northern Sudan would be required to develop a probable model of virus entry into the country.
- HPAI PDS should be carried out in all states in the Southern Sudan to confirm the absence or presence of HPAI. The study should target: (i) major towns that import and trade in poultry, especially those that trade with the Northern Sudan such as Renk, Bentiu and Aweil; (ii) towns that have a higher population density of poultry and major settlements close to rivers; and (iii) the three affected states in the north.
- Awareness campaigns should be intensified and strengthened in all states of the Southern Sudan to assist the Ministry of Animal Resources and Fisheries (MARF), Government of South Sudan (GoSS) and state Ministries in their HPAI-control strategy.
- Wild bird surveillance must be conducted to complement the results of the PDS, especially in the northern states.

N. MIRGHANI

Training session on PDS activity, the Sudan

- It is clear that Newcastle disease is common and vaccination should be offered to poultry-keepers to address their most important poultry disease problem. This would improve their food and economic security as well as promoting poultry-keeper compliance with future surveillance and control measures for HPAI.

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Porcine reproductive and respiratory syndrome (PRRS)

J. ANELLI

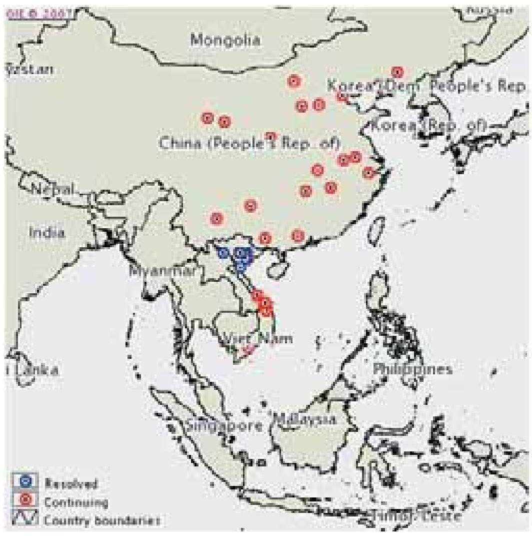
Swine diseases can be transmitted great distances on the back of a motorcycle.

Recent reports from the China and Southeast Asia have alerted the world to a new variant of the porcine reproductive and respiratory syndrome (PRRS) virus. The disease produced by this virus is characterized by high morbidity and significant mortality that has devastated the pig industries of the affected countries (Figure 1). The growing import/export activities in that part of the world and the many countries involved prompted EMPRES to issue an early warning message. Official veterinary services in those areas, and throughout South-east Asia and parts of Africa, should be aware of this new variant of the PRRS virus, and offer advice on how to prevent the disease from establishing itself in new areas and how to control outbreaks effectively in the event that the virus does take hold.

Introduction

PRRS is an infectious viral disease of swine that is easily transmitted through direct contact to susceptible pigs and vertically to foetuses. PRRS is considered the most economically important viral disease of intensive swine farms in Europe and North

Figure 1: Porcine reproductive and respiratory (PRRS) outbreaks reported to OIE in Asia during 2007



Source: OIE, 2007

America. It is characterized by reproductive failure in sows and respiratory distress in piglets and fattening pigs, which, combined with its potential for rapid spread, can cause significant production and economic losses. PRRS, also known as "mystery swine disease", "blue ear disease", "porcine endemic abortion and respiratory syndrome (PEARS)" and "swine infertility respiratory syndrome (SIRS)", is not known to be a zoonosis. The PRRS virus (PRRSV) is an enveloped positive-stranded RNA virus, classified in the order Nidovirales, family Arteriviridae, and genus Arterivirus (Zimmerman *et al*., 2006). Two major serotypes of the virus are currently described, the European and the American types. This classification is significant in that vaccines made for one serotype will not completely protect against the other.

Geographical distribution

PRRS was first detected in North America in 1987 and in Europe in 1990 and has since then been recorded in most major pig-producing areas throughout the world (Table 1). Only Australia, New Zealand and Switzerland are reportedly free from PRRS infection. The most recent outbreaks have occurred in Sweden, South Africa, the Russian Federation, Viet Nam and China.

DEPARTMENT OF ANIMAL HEALTH, MARD (MINISTRY OF AGRICULTURE AND RURAL DEVELOPMENT), VIET NAM

Field veterinarians collecting specimens for PRRS laboratory diagnosis

Viet Nam: Between March and August 2007, 44 outbreaks grouped into two main epidemics were reported; the first in the northern provinces between March and May, and the second in the southern provinces during June and July. About 44,000 pigs were affected, of which over 4,000 died (OIE, 2007a). At the end of August 2007, Viet Nam declared that the epidemic was under control. However, during August and September 2007, nine new PRRS outbreaks were reported in Khanh Hoa, Ca Mau and Lang Son Provinces with mortalities of up to 24% (OIE, 2007b). Preliminary clinical experiments suggest that secondary or concomitant infections have been the cause of high mortality and morbidity.

Table 1: Status of PRRS in affected countries

Status	Countries reporting
Infection present (with no clinical disease)	Czech Republic, Lithuania, Mexico and Slovakia
Infection present (with clinical disease)	Canada, Colombia, Costa Rica, France, Germany, Ireland, Japan, Republic of Korea, Netherlands, Philippines, Portugal, Spain, United Kingdom and United States of America
Disease restricted to certain zone(s)/region(s) of country	Bolivia, Chile, Dominican Republic and Romania

Source: OIE, WAHID

China: Two major (American-type) PRRS occurrences have been reported in China since the mid-1990s. From June to September 2006, an atypical form of PRRS affected over two million pigs, of which 400,000 died in 16 provinces according to the China Animal Disease Control Center (CADC). Unlike other previous PRRS outbreaks in China and historical PRRS outbreaks worldwide, this form of the PRRS virus was more virulent and many adult pigs and pregnant sows died (Tian *et al*., 2007). Initially, a mixed infection of several agents (mainly PRRS, classical swine fever and porcine circovirus) was suspected (OIE, 2006). At the beginning of 2007, the disease re-emerged and, since then, it is reported to have infected 310,000 pigs, of which more than 81,000 have died in 26 provinces (ProMED, 2007b). Provinces along the Yangtze River in the south of China have been the most affected (OIE, 2006). While the disease was initially reported in both the commercial and backyard sectors, it now seems to be concentrated in the latter, where control is a greater challenge, especially in remote areas. A compulsory PRRS vaccination policy has been implemented in high-risk areas and in high-value herds (breeding pigs and large-scale commercial farms), using a newly developed vaccine matching the circulating strain. As of 22 August 2007, the authorities had administered 314 million doses of vaccine to immunize more than 100 million pigs, one-fifth of the nation's total (Martin *et al*., 2007). The outbreak has caused considerable economic losses and a rise in pork prices in eastern China (ProMED, 2007a). On 29 October 2007, the Ministry of Agriculture announced that PRRS was under control (ProMED, 2007b).

South Africa: In Africa, the disease situation is unknown. The first official reports came from South Africa in June 2004, when a total of 2,407 pigs from 32 infected farms (31 small farmers and 1 commercial unit) were slaughtered in Western Cape Province (OIE, 2004). Two small outbreaks were reported in the same area in October 2005 (OIE, 2005). In August 2007, the same European strain was also reported in Western Cape, involving at least 21 farms and 8,000 pigs (ProMED, 2007c). This outbreak was considered a resurgence of the 2004 outbreak (FAO field officer).

Clinical signs and diagnosis

The pig (Sus scrofa), both domestic and feral, is the only species known to be naturally susceptible to PRRS (AHA, 2004). The incubation period is between 4 and 8 days experimentally, but can range from 3 to 37 days in natural outbreaks (AHA, 2004). The clinical presentation and clinical signs of PRRS vary greatly between herds. In general, PRRS is characterized by reproductive failure of sows and respiratory distress in piglets and growing pigs. The characteristics of reproductive failure are infertility, late foetal mummification, abortions, agalactia, stillbirths, and weak piglets. These piglets usually die shortly after birth due to respiratory disease and secondary bacterial infections, such as *Salmonella cholerasuis*, *Haemophilus parasuis*, *Streptococcus suis*, *Mycoplasma hyopneumonia* and swine influenza virus (Hill, 1996).

Swollen eyelids and nasal discharge commonly observed in PRRS affected pigs

DEPARTMENT OF ANIMAL HEALTH, MARD, VIET NAM

In young piglets, high mortality rates will occur and, at the peak of an outbreak, losses from death may reach 60–70% (Hill, 1996) with 30–50% losses more common (Dee and Joo, 1994). The disease in weaned and fattening pigs is characterized by anorexia, lethargy, cutaneous hyperemia, dyspnea, rough hair coats, failure to thrive and an increase in mortality from secondary infections. Mortality rates are also elevated in the post-weaning period, varying between 4 and 20%. Depressions in post-weaning weight gain of up to 65 percent have been reported (Dee and Joo, 1994). Older pigs may show mild respiratory signs, which may also be complicated by secondary infections. Finishing pigs, boars, gilts and sows are often found to have sub-clinical infection (Zimmerman *et al*., 2006).

J. ANELLI

Mild congestion in lung tissue from a 3-month-old piglet exhibiting ataxia and dysnia from a farm suspected of having PRRS infection

Antibodies generally confer limited protection, and serum titres for PRRS-infected finishing pigs often decline with advancing pig age. Infected pigs can remain viraemic and infectious for very variable periods. When the virus is cleared from the blood, it can remain in lymphoid tissues for up to 150 days after exposure (OIE, 2004; Zimmerman *et al*., 2006).

Diagnosis and differential diagnosis: Virological diagnosis of PRRS is difficult. Isolation of the virus can be conducted on porcine macrophages, ascitic fluids or tissue cultures from organs such as lung, tonsil, lymph node and spleen. Virus identification and characterization are carried out by immunostaining with specific antisera. For laboratory confirmation, immunohistochemistry and *in situ* hybridization on fixed tissues and reverse-transcription PCR (RT-PCR) are used (OIE, 2004).

The detection of antibodies to PRRSV can be carried out using a wide range of serological tests: the immunoperoxidase assay, the indirect immunofluorescence assay and commercial or in-house enzyme linked immunosorbent assays (ELISA) (OIE, 2004).

Reproductive signs need to be differentiated from leptospirosis, porcine parvovirus infection, porcine enterovirus infection, haemagglutinating encephalomyelitis, Aujeszky's disease, African swine fever and classical swine fever. For the respiratory and post-weaning form of the disease, differential diagnosis is needed for swine influenza, enzootic pneumonia, proliferative and necrotizing pneumonia, Haemophilus parasuis virus infection, haemagglutinating encephalomyelitis virus, porcine respiratory coronavirus infection, syncitial pneumonia and myocarditis, postweaning multisystemic wasting syndrome and Nipah virus infection (AHA, 2004).

Epidemiology

The virus is shed in saliva (six weeks), urine (two weeks), semen (six weeks) and mammary gland secretions. Transmission can be by inhalation, ingestion (including ingestion of infected meat), coitus, transplacental, artificial insemination (also from vaccinated boars), pig bites and needles and other inanimate objects (equipment, instruments,

DEPARTMENT OF ANIMAL HEALTH, MARD, VIET NAM

High fever, was the most common clinical sign of the disease (sometimes called "Red Ear Disease")

clothing) or substances (water, food). Arthropod transmission has been suggested by some preliminary reports (Zimmerman *et al.*, 2006). PRRS is highly infectious and easily transmitted through direct contact among pen mates. Aerosol transmission is difficult, although it has been experimentally shown for distances of up to 2.5 meters (Zimmerman *et al.*, 2006).

PRRS is unstable outside the pH 5.5–6.5 range. Low concentrations of detergents and solvents such as chloroform and ether rapidly inactivate PRRS. The virus survives in water for up to 11 days, but drying quickly inactivates it (Benfield *et al.*, 1999a). As a result, the virus does not survive in the environment or on fomites under dry conditions.

PRRS can be isolated from muscle and lymphoid tissues up to 24 hours after slaughter (even from muscle that had been frozen at –20°C for one month). Nevertheless, the virus titres decrease with cooling, hardening and freezing, although PRRS can survive several weeks at 4°C in bone marrow (Bloemraad *et al.*, 1994). Cooking, curing and rendering are sufficient to inactivate PRRS in meat, minimizing the risk of spread in this way. The real threat occurs when unprocessed infected meat is fed to susceptible pigs (swill feeding) (AHA, 2004).

The most likely path of entry into a farm or country is asymptomatically infected pigs, via semen and swill feeding. If animals or products are imported from countries where PRRS is known to be present, appropriate procedures such as herd freedom certification, serological testing and quarantine should be followed. It would be very difficult to contain the disease if the feral pig population became affected (AHA, 2004).

J. ANNELLI

This owner of a village in-swine operation is proud to show off the quality and health of his pigs, Viet Nam

Prevention and control

The key elements of a PRRS control and eradication programme are early disease detection and rapid laboratory confirmation; quick identification of the infected farms; and control of the infection through different stamping-out strategies. Control options will depend on pig density, the degree of multi-site structure of farms, the movement of pigs, and whether infected pig meat is processed by cooking. Because PRRS is transmitted by direct contact, control measures are advisable although not critical at slaughter plants, meat-processing plants and sale yards (AHA, 2004).

Prevention control measures for PRRS and other infectious diseases of swine

Surveillance

The first step is to assess the extent of the infection. Veterinary officers or inspection teams should perform clinical examination of pigs, take blood samples from a statistically significant number of pigs, and examine production records for evidence of reproductive problems, such as abortions and neonatal mortalities. Special attention should be paid to farms with a recent history of pig purchases, sale of breeding or grower stock, and artificial insemination. Serosurveillance is particularly valuable in asymptomatic herds and in those in contact with feral pigs, if such populations become infected (AHA, 2004). Whenever an infected pig herd is found, its origin should be traced back and contacts should be investigated. Passive surveillance and reporting should be encouraged among pig owners through awareness campaigns. Because programmes of investigation are often not implemented at local government and village levels, it is recommended that epidemiological investigation should be carried out in villages by field veterinary staff and extension personnel asking a single question: "Have you seen this disease before?"

Quarantine and movement controls

Quarantine should be imposed on all farms with known or suspected infection. In a free-ranging or village situation, pigs should be enclosed. Movement of pigs in and out of farms/villages should be prohibited, other than for those animals destined for immediate slaughter.

Movement controls should be applied to pigs and carcasses (for further processing by cooking) inside and out of the infected zone. Vehicles used to transport infected pigs should be decontaminated (see "Cleaning and disinfecting" below).

Biosecurity

Farmers should be encouraged to enhance their biosecurity levels: new animals only from PRRS-free herds, visitors kept to a minimum, perimeter fencing, removal of effluent, pig-loading facilities located at perimeter fences, and cleaning and disinfecting of pig-carrying trucks after unloading (AHA, 2004). Perimeter fencing will prevent the spread of disease from domestic to feral pigs and vice versa. The access of wild pigs to domestic food scraps should be prevented (AHA, 2004). Village settings, where pigs may roam freely, present additional biosecurity challenges although the same biosecurity principles apply. Equipment and premises should be cleaned and disinfected periodically. Pigs should be kept in fenced enclosures, whenever possible. Sharing of equipment between farms/villages should be discouraged, unless proper decontamination is performed. Pig owners/workers should avoid contacting other pig populations and dedicated work clothing should be promoted. Replacement breeding stock should come from PRRS-free and trusted sources. Casual visitors, particularly those who have contact with pigs, should be discouraged. A sign at the farm/village entrance advising visitors not to come close to pigs is also recommended. Entrails and other discarded parts of slaughtered pigs should be disposed of in an appropriate manner, such as composting, burying or burning. When the disease is present in an area, decontamination instruments should be made available at village entry and exit points (disinfectant, brush and a bucket of water or a foot bath).

Zoning

If the disease is endemic in only part of a country it is possible to establish diseased and disease-free zones and enforce tight controls on the movement of pigs and products between zones (AHA, 2004).

Stamping out

Stamping-out strategies can be considered depending on the epidemiological situation. It should only be carried out in the first stage of the infection when the infected area is limited and the number of pigs to kill is still low. Traditional stamping out has its limits in developing countries because of the lack of funds for compensation. Without compensation, stamping out is often rejected by pig owners, and this may contribute to more rapid dissemination of the disease through illegal movement of sick animals. Thus, a flexible stamping out approach is required. Modified stamping out consists of an initial quarantine followed by slaughter of all marketable pigs at an abattoir. For the remaining pigs, several options are available: 1) destroy unsaleable on-farm pigs and offer compensation, 2) allow growing pigs to grow to market size, and/or 3) allow pregnant sows to wean their litters. Diseased pigs cannot be sent to abattoirs; they must be destroyed or quarantined until the symptoms pass (AHA, 2004). The carcasses of destroyed pigs must be disposed of in a safe manner after stamping out is completed. Reference should be made to the FAO Manual on procedures for disease eradication by stamping out (http://www.fao.org/DOCREP/004/Y0660E/Y0660E00.HTM) for more information on on-site slaughter and disposal procedures.

Cleaning and disinfecting

For the decontamination of farms, vehicles and equipment, routine cleaning and disinfection with almost any chemical is enough because of the low resistance of PRRSV. Phenolic or organic acid disinfectants, chlorine, quaternary ammonium compounds and lipid solvents (detergents) have all been reported to be highly effective in inactivating PRRSV (AHA, 2004; Zimmerman *et al*., 2006). Either replace or put aside equipment which cannot be easily disinfected.

Vaccination

Vaccination is one of the most effective tools to control PRRS, although it does not prevent PRRSV infection. Vaccines should contain the specific antigenic type to be effective. Experience shows that vaccination with a homologous strain is more effective than vaccination with a heterologous strain. In the United States there are approved modified-live virus (MLV) vaccines for the reproductive and respiratory forms of PRRS. MLV vaccines are used in piglets from 3 weeks of age or sows and gilts 3–6 weeks prior to breeding. In Europe and the United States of America, an inactivated virus vaccine against the reproductive form of PRRS is also available on the market (OIE, 2004). One recommended strategy is the vaccination of seronegative replacement breeding stock 60–90 days before introduction (AHA, 2004).

Animals vaccinated with MLV vaccines shed the vaccine strain virus, which is then transmitted in the field, complicating the problem of detecting infection with wild-type virus, both through virology and serology (Zimmerman *et al*., 2006).

Sentinel and restocking

A minimum 14-day period after decontamination is required before restocking to avoid re-infection. Serology on restocked animals should be carried out after two months and again six weeks later (AHA, 2004). Given husbandry practices in many parts of the world (Africa, Latin America and Asia), there is a potential danger that restocking aimed at re-establishing former pig populations could contribute to creating the conditions for a new outbreak.

Public awareness

PRRS outbreaks should be well publicized, emphasizing the dangers of swill feeding, particularly to small pig holdings. Commercial farms should be encouraged to enhance their biosecurity levels (AHA, 2004). In African, Eastern European and many Asian countries, an early warning system encouraging early reporting, and consequently early reaction, should be implemented in every state or region and at the national level. Ensuring the cooperation of pig owners can be facilitated through information/sensitization events at village level meetings. Civil administrative authorities should also be put on a state of alert with periodical epidemiological information.

The reluctance of villagers to implement control measures is motivated by a number of different considerations, including:

1 Village pig populations play an important role in cleaning up human left-overs.
2 Pigs are a good source of income for families.
3 Villagers do not understand why, after having lost most of their pigs, they are asked to kill those remaining.
4 Pigs have an important social function because they are slaughtered to meet family needs or ritual/traditional ceremonies.
5 Villagers always harbour the hope that the disease will stop by itself and that some of their pigs will escape death because they believe that there is no disease capable of killing all the pigs.

References

Animal Health Australia. 2004. *Disease strategy: Porcine reproductive and respiratory syndrome* (Version 3.0). Australian Veterinary Emergency Plan (AUSVETPLAN). Canberra, ACT, Primary Industries Ministerial Council, 3rd edn.

Benfield, D.A., Collins, J.E., Dee, S.A., Halbur, P.G., Joo, H.S., Lager, K.M., Mengeling, W.L., Murtaugh, M.P., Rossow, K.D., Stevenson, G.W. & Zimmerman, J.J. 1999. Porcine reproductive and respiratory syndrome. *Diseases of Swine*, 18: 201–32.

Bloemraad, M., de Kluijver, E.P., Petersen, A., Burkhardt, G.E. & Wensport, G. 1994. Porcine reproductive and respiratory syndrome: temperature and PH stability of Lelystadt virus and its survival in tissue specimens from viraemic pigs. *Veterinary Microbiology*, 42: 361–71.

Dee, S.A. & Joo, H.S. 1994. Prevention of the spread of porcine reproductive and respiratory syndrome virus in endemically infected pig herds by nursery depopulation. *Veterinary Record*, 135: 6–9.

Hill, H. 1996. PRRS: Practical strategies for prevention and management of a positive herd. Proceedings of the 1996 North Carolina Pork Producers Conference, January, 1996, Fayetteville, Carolina, pp. 1–7, 9–10.

OIE. 2004. Porcine reproductive and respiratory syndrome. In: *Manual of Diagnostic Tests and Vaccines for Terrestrial Animals*, Part 2, Section 2.6., Chapter 2.6.5. Available at: https://www.oie.int/eng/normes/MMANUAL/A_00099.htm

OIE. 2005. Porcine reproductive and respiratory syndrome in South Africa. Follow-up report No. 2. *Disease Information* (Weekly info), 21 September 2006, 19(38).

OIE. 2006. Miscellaneous: "Swine high fever disease" in pigs in China (People's Rep. of). *Disease Information* (Weekly info), 11 November 2005, 18(45).

OIE. 2007a. Report reference: 20071004 TY-DT. OIE Ref: 5840, 1 August, Country: Viet Nam.

OIE (2007b). Porcine reproductive and respiratory syndrome, Viet Nam. Follow-up report No. 3), 3 October 2007.

ProMED-mail. 2006. Undiagnosed disease, porcine – China (03): OIE, 24 September, 20060924.2732 (available at: http://www.promedmail.org). Accessed 19 August 2007.

ProMED-mail. 2007a. Porcine reproductive and respiratory syndrome – China (06), 14 September, 20070914.3058 (available at: http://www.promedmail.org). Accessed 17 September 2007.

ProMED-mail. 2007b. Porcine reproductive and respiratory syndrome – China (08); 30 October, 20071030.3523 (available at: http://www.promedmail.org). Accessed 30 October 2007.

ProMED-mail. 2007c. Porcine reproductive and respiratory syndrome – South Africa (Western Cape), 31 August, 20070831.2867 (available at: http://www.promedmail.org). Accessed 19 September 2007.

Tian, K., Yu, X., Zhao, T., Feng, Y. & Cao, Z. 2007. Emergence of Fatal PRRSV Variants: Unparalleled Outbreaks of Atypical PRRS in China and Molecular Dissection of the Unique Hallmark. *PLoS ONE*, 2(6): e526. doi:10.1371/journal.pone.0000526

Zimmerman, J., Benfield, D., Murtaugh, M., Osorio, F., Stevenson, G., Torremorell, M. 2006**.** Porcine reproductive and respiratory syndrome virus. In: *Diseases of Swine*, 9th edn.

Source:

FAO-EMPRES Focus on PRRS:
http://www.fao.org/docs/eims/upload//235243/Focus_ON_2_07.pdf

Capacity building for disease surveillance in wild birds

Since the 1980s it is estimated that approximately 75%[1] of emerging pathogens that cause human disease are zoonotic in origin, in that they are shared among animals and people. Within agricultural and wild-animal populations, emerging infectious diseases (EIDs) are also on the rise with increasing impact, frequency, and geographic distribution. These diseases, many of which are linked to environmental change, land-use decisions, intensified farming practices, and globalization, pose the greatest risk to agricultural production, livelihoods, and wildlife health. More recently, as has been seen with monkey pox, SARS[2], West Nile virus, and H5N1 highly pathogenic avian influenza (H5N1 HPAI), these diseases are spreading into human populations, causing human illness and death. Some such as HPAI have the potential to increase the actual risks for the next large human pandemic estimated to kill millions.

T. MUNDKUR

Field demonstrations began before dawn, Lake Ichkeul Ramsar Site, Tunisia training course

The Wildlife Disease Programme at FAO Emergency Centre for Transboundary Animal Diseases (ECTAD) has used H5N1 HPAI (which affects domestic poultry, humans and wild birds) as a starting point for increasing in-country national and regional capacity through the training and education of biologists, veterinarians, ornithologists, resource managers, and others.

During the second half of 2007, three regional training courses were held. The first was for the Balkan region (Albania, Bosnia and Herzegovina, the former Yugoslav Republic of Macedonia, Kosovo, Montenegro and Serbia) in Belgrade, Serbia (25–27 September) in cooperation with the FAO Subregional Office for Europe (SEUR) Budapest, Hungary and the Natural History Museum of Belgrade. The second for the Near East and North Africa region (Egypt, Iraq, Jordan, Lebanon, the Syrian Arabic Republic, West Bank and the Gaza Strip and Yemen) and with additional participants from Kenya, Nigeria and Uganda took place at the Azraq Wetland Reserve in Jordan (12–15 November) in cooperation with the Ministry of Agriculture in Jordan and the Royal Society for the Conservation of Nature. The third was held for the Northern and Western Africa region (Algeria, Benin, Burkina Faso, Cote d'Ivoire, Ghana, Mauritania, Morocco, Senegal and Tunisia) in Tunis, Tunisia (11–14 December) in cooperation with the Ministry of Agriculture and Water Resources in Tunisia and FAO's Regional Animal Health Centre for North Africa. The five-day courses consisted of classroom lectures, field experience, and wild bird handling with specialized training on avian biology, migration ecology; population-monitoring methods; low and highly pathogenic avian influenza viruses; disease transmission between domestic and wild birds; proper wild bird capture and handling techniques; and proper disease-sampling procedures for avian influenza and other diseases.

[1] **Taylor, L.H. Latham, S.M. & Woolhouse, M.E.** 2001. Risk factors for human disease emergence. *Philos. Trans. R. Soc. Lond. B. Biol. Sci.*, 29 July, 356(1411): 983–9. doi: 10.1098/rstb.2001.0888

[2] Severe acute respiratory syndrome.

Presentations included:

1 an update on the global HPAI situation and FAO programmes and networks for HPAI control;
2 an overview of FAO wildlife activities;
3 HPAI ecology and the role of wild birds;
4 capture techniques for wild birds;
5 census and monitoring techniques at important bird habitats;
6 introduction to ornithology and bird ecology;
7 basics of bird migration and flyways;
8 principles of disease surveillance in wildlife;
9 sampling wild birds and assuring good-quality sample storage and delivery to laboratories;
10 results of wildlife surveillance activities conducted by FAO, CIRAD,[3] Wetlands International, and other partner programmes.

The courses were modified for each region to ensure that local knowledge was incorporated and the lessons learned were applicable to local and regional wild bird ecology, monitoring, surveillance, and flyway programmes.

The courses were highly interactive and included group discussions about approaches to performing farm-outbreak investigation (addressing the wildlife-agriculture interface) given a variety of scenarios. Participants also discussed the need to: (i) include wildlife components in broader national surveillance strategies, even if it was just a monitoring component, (ii) ensure that Ministry of Agriculture outbreak response teams routinely included an ornithologist to address the role of wildlife in an outbreak (if any), and (iii) revise National HPAI Preparedness and Response Plans to incorporate wildlife issues.

In the field portion of the courses, wild birds (mostly passerines) were captured using mist nets, and the use of the nets and walk-in traps was demonstrated. Demonstrations of bird counting and monitoring techniques were performed and species-identification activities were undertaken using spotting scopes and binoculars. With live birds, bird handling, cloacal and tracheal swabbing and other sample collection methods were demonstrated and participants who wanted to work with live birds were trained in these techniques.

With these latest courses successfully completed, the FAO Wildlife Disease Programme has coordinated, facilitated, or implemented training of more than 300 in-country nationals from over 80 countries in the Caribbean, South America, Europe, Africa and Asia since 2005. The courses are always conducted with support from local in-country biologists, local Ministries, NGOs and universities, and often in cooperation with organizations such as CIRAD, Wetlands International, Wildlife Conservation Society, Wildfowl & Wetlands Trust (UK), Wildlife Conservation Society, USDA[4] or others.

FAO

Demonstrating proper swabbing techniques in Serbia

S. NEWMAN

Teaching the use of a spotting scope to conduct wild bird surveys in Jordan

[3] French Agricultural Research Centre for International Development.

[4] United States Department of Agriculture.

Future plans are to continue with training that brings together different professional groups (veterinary medicine, virology, wildlife ecology, ornithology, etc.): it is only through integrated collaborative activities that we can prevent, control, and respond to emerging infectious diseases that affect the health of agriculture, wildlife and humans. To ensure delivery on the ground, FAO will also look to extend beyond delivery of regional training events with a number of national training courses. It is planned to provide such training in Bangladesh, India and Myanmar during 2008.

FAO in action

FAO strengthens actions on early detection and prevention of highly pathogenic avian influenza (HPAI) (H5N1) in Latin America and the Caribbean

FAO initiatives to strengthen the capacities for prevention and control of HPAI in 33 countries of Latin America and the Caribbean (LAC) have shown substantial results. These were presented during the Sub–regional Projects Conclusion Meeting held in Santiago, Chile, 30–31 October 2007

R. CAMPUZANO

CVOs from the Caribbean region collecting AI printed communications designed for the region, Santiago, Chile

Although the American continent is free from H5N1 HPAI, HPAI has shown unprecedented dissemination, infecting more than 60 countries in Africa, Asia, Europe and the Near East, causing losses of over US$10 billion in the poultry sector of Southeast Asia alone. Moreover, the deaths of 206 people from the disease are a warning to Latin America and the Caribbean (LAC) regarding the seriousness of HPAI and its possible introduction.

Taking this into account, FAO, through the FAO Emergency Centre for Transboundary Animal Diseases (ECTAD) and its Regional Office for Latin America and the Caribbean, developed four emergency Technical Assistance Cooperation Projects for HPAI early detection and prevention in the Sub–regions of the Caribbean (TCP/RLA/3103), Central America (TCP/RLA/3104), Andean Region (TCP/RLA/3105) and South Cone (TCP/RLA/3106). The project involves 33 countries (Antigua and Barbuda, Argentina, Bahamas, Barbados, Belize, Bolivia, the Bolivarian Republic of Venezuela, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominica, the Dominican Republic, Ecuador, El Salvador, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, Paraguay, Peru, Saint Kitts and Nevis, Saint Vincent and the Grenadines, Saint Lucia, Suriname, Trinidad and Tobago and Uruguay).

R. CAMPUZANO

Round-table panoramic left-hand side showing selection of regional CVOs, international animal health organizations and private sector representatives, Santiago, Chile

The outputs of these projects resulted in: emergency actions to strengthen epidemiological surveillance; the enhancing of veterinary-services capacities for laboratory diagnostics; the creation of scientific knowledge on wildlife-birds migrating habits; the development of information and technology links between sub-regions for AI surveillance, and the establishment of a regional HPAI prevention and control communication strategy.

The technical assistance projects were executed, as planned, within 18 months (May 2006 through October 2007) and were concluded with a final meeting.

Chief Veterinary Officers, or their representatives, from 26 out of the 33 beneficiary countries, with representatives of international organizations such as the World Organisation for Animal Health (OIE), Organismo Internacional Regional de Sanidad Agropecuaria (OIRSA), United States Department of Agriculture (USDA), Centre de coopération internationale en recherche agronomique pour le développement (CIRAD), Inter-American Institute for Cooperation on Agriculture (IICA), Pan American Health Organization (PAHO)/World Health Organization (WHO) and Pan American Foot-and-Mouth Disease Center (PANAFTOSA), the Latin American Poultry Association (ALA) and the Poultry Producers Associations from Colombia, Costa Rica, Chile and Peru.

During the two-day conference, experts on the HPAI projects took part in roundtable discussions and evaluations of project activities. All agreed on the need to continue the activities related to HPAI in LAC. A number of recommendations were provided to and unanimously agreed by the participants, including: strengthening HPAI prevention and consolidating control of the disease by improving national/subregional capacities for surveillance, diagnosis, control and communication. Based on the success of the projects already implemented, the participants concluded that FAO must be the organization to integrate HPAI prevention and control, and coordinate actions and efforts among countries and regional and international organizations.

WORKSHOPS

TAD*info* workshop

TAD*info* is a tool developed by FAO/EMPRES to allow national veterinary services to record disease events and control measures. It keeps track of information sent from the field staff and any other informants, allows them to view the spatial distribution on a daily basis and decide on further actions whenever necessary.

Since 2004, there have been five regional workshops and seven national workshops organized under various projects (see Table 1), and the programme has been provided for twenty nine countries.

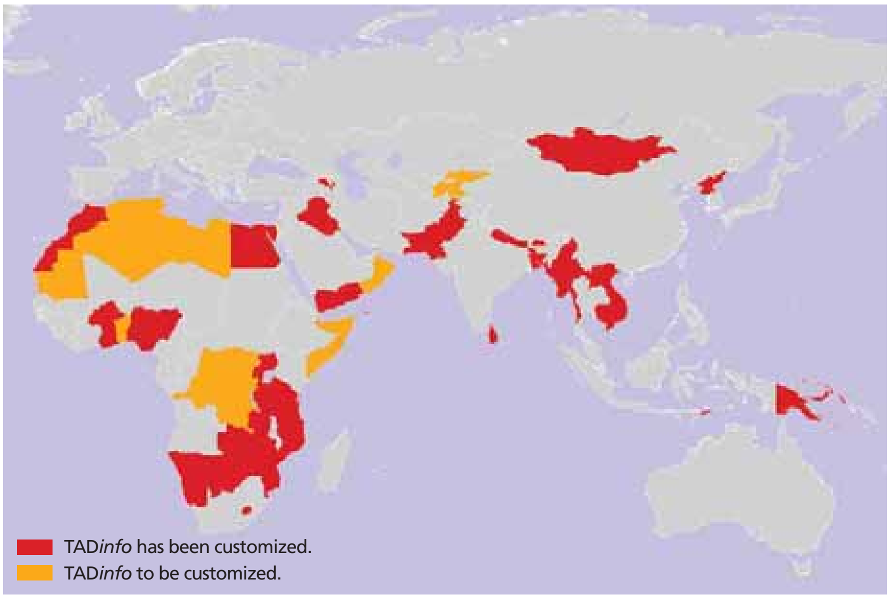
The regional workshops (attended by a TAD*info* manager from each country in the region), facilitate understanding of the latest functions and provide a forum for in-depth discussion on common needs and information analysis.

The national workshops, which are usually coupled with the TAD*info* installation for the country, provide hands-on training on data entry in each module and how to use the output. The real reporting formats of the country are used as the source of information for the data-entry practice, and sometimes provoke a discussion on


A. KAMATA

TADinfo workshop in the Lao People's Democratic Republic

Figure 1: Areas where TAD*info* has been customized and areas where it will be customized



Source: A. Kamata, FAO-EMPRES

A. KAMATA

Opening speech by Mr Konuma, DADG at TADinfo regional workshop in FAORAP, Bangkok, Thailand

how best to collect disease information and enter it into the database, how to minimize the need to come back for further information and how to share the data-entry work. After each national workshop, a separate intensive session with the TAD*info* manager of the country on how to monitor the TAD*info* server and its various settings is necessary. It is more common to train one or two TAD*info* managers on site at the time of installation in Training of Trainers (TOT); in turn they will train their colleagues in the local language. In addition to the workshops listed below, there have been many national workshops organized locally.

Each national animal health system has its own defined reporting method, and faces the problem of getting timely and detailed information at the HQ level. In some countries, the public service structure is heavily decentralized; as a result, investigating a disease outbreak and sending a report to the central government in a timely manner is not an obligation for the veterinary staff of local governments. TAD*info* workshops and installation missions highlight these aspects and discuss how best to assist field staff in reporting suspicion, recording and analysing data at HQ, and sending feedback to the field staff. Although the priority is generally on methods of reporting the disease situation to the Chief Veterinary Officers, feedback is also very important. It provides field staff with information on the disease situation around his/her responsible area and also encourages further reporting when they see their information is actually used. Most countries have well-trained veterinary epidemiologists, but it is necessary that staff are trained on how to use already installed spread-sheet software to complete statistical analysis and create

Table 1: Tad*info* workshops, 2004–2007

Date	Location	Type
November 2004	Namibia	Regional workshop under TCP/RAF/3006A
November 2005	Thailand	Regional workshop under TCP/RAS/3014E
September 2006	Nigeria	National workshop under UTF/NIR/047/NIR (FS)
October 2006	Ghana	Regional workshop under TCP/RAF/3106A
December 2006	Bhutan	National workshop under OSRO/RAS/505/USA
December 2006	Cambodia	National workshop under OSRO/RAS/505/USA
April 2007	Lao PDR	National workshop under OSRO/RAS/505/USA
June 2007	Bangladesh	National workshop under OSRO/RAS/605/USA
July 2007	Italy	Egypt national workshop under OSRO/GLO/601/SWE
August 2007	Rwanda	Regional workshop under OSRO/RAF/602/BEL
September 2007	Thailand	Regional user workshop under TCP/RAS/3014E

charts. TAD*info* national workshops provide some suggestions on how to use data and computers to allow national epidemiology unit staff to make the best use of datasets to provide analysis to decision makers.

Clearly, it is not easy for a veterinary service to predict the future – even with databases and the capacity to perform epidemiological analysis on a regular basis. However, if more countries begin to record unusual events (such as respiratory syndromes in unusual seasons) and review data on a spatial basis, it may be possible for neighbouring countries to communicate incidents to take coordinated preventive actions on both sides of the border when necessary.

A. KAMATA

*TAD*info *national workshop, December 2006, Bhutan*

Meetings: recommendations

Rinderpest: Global Rinderpest Eradication Programme (GREP) Workshop – FAO HQ, 25–26 September 2007

Background

Since its establishment in 1994, FAO's Emergency Prevention System for Transboundary Animal and Plant Pests and Diseases (EMPRES) has played a major role in the fight against persisting and/or spreading transboundary animal diseases (TADs) at global and regional levels, placing the emphasis on endemically infected countries.

One of the most important EMPRES activities is the Global Rinderpest Eradication Programme (GREP), a time-bound programme which aims to ensure global eradication of rinderpest virus by 2010. GREP has been so successful that Asia and large tracts of Africa have now been free from rinderpest for an extended period of time.

Y. SHIBIAO

Participants to the GREP workshop, FAO HQ, Rome, Italy

Worldwide disease eradication has already been achieved for one virus infection of humans – smallpox – and is currently being attempted for several other human pathogens. Successful eradication of rinderpest will not only remove a real scourge of cattle in the developing world but encourage other global campaigns to eradicate diseases of domestic animals.

The GREP Consultation meeting held in 2002 in Rome agreed on a set of specific recommendations to enable countries and partners to progress along the OIE pathway in Africa (Somali ecosystem) and Asia (Near East and Central Asia).

GREP is also one of the pillars of the Global Framework for Progressive Control of Transboundary Animal Diseases (GF-TADs), a joint FAO/OIE initiative launched in 2004 which combines the strengths of both organizations to achieve agreed common objectives. GF-TADs is a facilitating mechanism that aims to empower regional alliances in the fight against transboundary animal diseases (TADs), to provide capacity-building and to assist in establishing programmes for early warning, prevention and control of major TADs based on regional priorities.

The GF-TADs programme is articulated along four main lines of activity:

1 To address and implement action against priority diseases as agreed by relevant stakeholders.
2 To develop regional and global early warning systems for major animal diseases and selected zoonoses.

3 To enable and apply research on the causal agents of TADs at the molecular and ecological levels for more effective strategic disease management and control.
4 To complete the Global Rinderpest Eradication Programme.

GREP has worked and continues to work closely with the OIE,[1] AU-IBAR,[2] the Joint FAO-IAEA[3] Programme, the IAH[4] at Pirbright, the United Kingdom, CIRAD,[5] other international and regional organizations, numerous non-governmental organizations and countries to advance progressive rinderpest control and eradication. Many donors (the European Community, Ireland, Italy, the United Kingdom and the United States of America) have provided generous support for the Programme.

In May 2007, the adoption of the new Terrestrial Animal Health Code, and specifically the chapter and annex on rinderpest, during the 75th OIE General Session marked the start of the final thrust towards achieving global rinderpest freedom accreditation by the deadline of 2010.

Workshop objectives

With a view to consolidating achievements to date and preparing recommendations for the future, EMPRES/GREP organized a two-day workshop at FAO headquarters from 25 to 26 September 2007.

The workshop brought together the Minister of Livestock of the Transitional Federal Government of the Republic of Somali, the Chief Veterinary Officers or their delegates of China, Ethiopia, Kenya, Somalia and the Syrian Arab Republic, OIE, Joint FAO-IAEA Division, CIRAD, AU-IBAR and IAH-Pirbright representatives, senior veterinarians and international experts from France, Kenya, the United Republic of Tanzania and the United Kingdom. Unfortunately, representatives of the Russian Federation who had hoped to attend were unable to.

Four major workshop objectives were identified:

1 Provide an update on the status of rinderpest disease verification or absence.
2 Discuss the modalities for drafting a global declaration.
3 Identify the role of each actor in the global declaration process.
4 Agree on a work plan and Memorandum of Understanding between FAO and OIE.

The recommendations on the rinderpest eradication process which were discussed during the final plenary session of the workshop are summarized below.

[1] World Organization for Animal Health.
[2] African Union-InterAfrican Bureau for Animal Resources.
[3] International Atomic Energy Agency.
[4] Institute for Animal Health.
[5] French Agricultural Research Centre for International Development.

Workshop recommendations[6]

Global Declaration

The eradication of rinderpest is proposed as a time-bound programme to be completed by 2010, and a mechanism is needed to facilitate the joint activities of the two world bodies concerned with animal health (FAO and OIE). This major and unique undertaking presents a learning opportunity for good disease management and inter-regional and country collaboration in general.

FAO-OIE partnership for the Global Declaration

1 FAO-GREP and OIE should establish a Global Scientific Commission to start immediate preparations for the final scientific evidence for global verifiable absence of rinderpest virus in the natural environment. This will lead to the Declaration of Global Freedom from Rinderpest by the two partner organizations in 2010.

2 FAO (GREP and the Joint FAO-IAEA Division) and OIE should set up a Standing Committee to monitor and drive the process of ensuring that all countries achieve scientific evidence for the absence of rinderpest viral activity in the natural environment before 2010. The Standing Committee should also drive the process of establishing the Global Scientific Commission.

3 FAO and OIE should start developing a legal framework for the declaration and the associated national obligations for assuring the maintenance of global freedom from rinderpest, including the code of practice for virulent rinderpest virus.

4 FAO and OIE should mount an awareness-raising campaign on the progress of GREP and ways to support action to finalize the declaration through a three-tier mechanism: (i) Chief Veterinary Officers – OIE International Committee; (ii) Ministers of Agriculture – FAO Conference; (iii) heads of states – United Nations.

5 OIE should place the issue of the Global Declaration on the agenda of its annual General Session.

6 FAO should promote rinderpest eradication during its Council, Conference and Committee on Agriculture (COAG) sessions.

7 GREP should prepare a joint FAO-AGAH/OIE paper on Global Rinderpest Eradication for presentation to COAG.

[6] Also available at: http://www.fao.org/AG/AGAInfo/programmes/documents/grep/GREP_Recom_Sep07.pdf

Countries lagging in their performance or commitment to the OIE Pathway or recognition

8 GREP should contact historically rinderpest-free countries to engage and assist them in compiling OIE questionnaires and formulation of their dossier.

9 GREP and OIE should contact the Russian Federation and Kazakhstan to seek their engagement in conducting a serological survey along their southern borders with Asian countries and in submitting their dossier – a joint GREP-OIE mission to the Russian Federation is foreseen.

10 GREP should contact those countries in Africa, Asia and the Near East that have not embarked on the OIE Pathway to ensure that they take specific action and, if they have not already done so, commit themselves to meeting the GREP deadline.

11 OIE and FAO's Regional Animal Health Centres should encourage countries in their respective regions to submit dossiers and/or identify issues (such as technical capability, consultants, funding, diagnostic kits) to be submitted to the GREP Secretariat for resolution.

Progress

12 Afghanistan, Tajikistan, Turkmenistan and Uzbekistan should be encouraged to submit their prepared dossiers as soon as possible.

Somali ecosystem (SES)

Considering that the SES is made up of the three countries (Ethiopia, Kenya and Somalia) in which the livestock population constitutes a continuum that is epidemiologically uniform, regardless of national boundaries.

13 The persistence of seropositive animals in the Somali ecosystem (in three defined regions of southern Somalia) should be the subject of comprehensive regional epidemiological investigation with a targeted approach in areas where seropositivity has been found.

14 A joint investigation team should be constituted, comprising Ethiopian, Kenyan and Somali experts together with the Somali Ecosystem Rinderpest Eradication Coordination Unit (SERECU) and GREP-OIE personnel; this team should carry out its investigation before January 2008.

Viral strains

15 The sequestering and destruction of field or research viruses should not be linked with GREP or procedures for accreditation of disease-free status.

16 Joint FAO-GREP/OIE guidelines should be developed on laboratory identification, registry and safe disposal.

17 Upon declaration of global eradication, further efforts for the sequestering and destruction of viral strains should be undertaken.

18 A survey of viral stocks and sample locations should be conducted.
19 Laboratories authorized to handle rinderpest virus should collate information on virus repository, history and research or diagnostic personnel/activities being carried out.
20 In the near future, it would be beneficial to identify only a few laboratories authorized to handle rinderpest virus (e.g. FAO or OIE reference laboratories). In cases where countries want to retain their capacity or intellectual property, one national laboratory with appropriate levels of biosecurity should be given responsibility for virus retention.
21 Countries should be encouraged to store the sera collected safely under GREP for the stated reasons and in view of the Foresight prediction of future risks from new/emerging diseases.

Vaccines

Given that vaccination has been one of the most significant tools in rinderpest eradication.

22 Rinderpest vaccine use, production, commercialization and distribution should cease.
23 Vaccine master seed strains should be catalogued, registered and kept under appropriate biosecurity conditions.
24 Sequences of vaccine strains should be made available to research laboratories.
25 GREP should embark on the identification of historical producers of vaccines and obtain information on their current status, and identify where current vaccines are still being formulated or maintained.
26 GREP should develop a communications plan for producers, emphasizing the importance of not promoting, producing, commercializing or distributing rinderpest vaccine; FAO's Regional Animal Health Centres can assist in this activity.
27 The GREP website should be updated on issues of communication.

International Organizations

Institute for Animal Health (IAH), United Kingdom

28 IAH should assist GREP over the next two years (2008–2009) in testing at least 100,000 rinderpest samples.

Centre de coopération internationale en recherche agronomique pour le développement (CIRAD), France

29 CIRAD should assist in testing wildlife samples or in supporting IAH (currently overextended in response to foot-and-mouth and bluetongue outbreaks in the United Kingdom) in the analysis of domestic animal samples.

Donors

30 Acknowledging the role that donors have played in rinderpest eradication, they should be urged to offer proactive and re-engagement support for the final eradication of rinderpest.

Food and Agriculture Organization of the United Nations (FAO)

31 FAO's Animal Health Service should seek the agreement of the FAO Director-General for strong FAO support during the final stages of GREP, including highly focused activities in the process of rinderpest-free accreditation in key countries.

32 FAO's upper management should support GREP by informing member countries during ministerial-level conferences.

33 FAO should secure funds through its Technical Cooperation Programme (TCP) facility to complete the process of final eradication of rinderpest in Africa, Asia and the Near East.

Joint FAO/IAEA Division

34 FAO/IAEA should assist regional groups of countries to strengthen the laboratory networks with provision of Technical Cooperation for this purpose.

World Organization for Animal Health (OIE)

35 Given the number of countries to be evaluated by the Rinderpest Ad Hoc Group before 2010, at least two rinderpest Ad Hoc group meetings should be organized every year up to 2010.

36 OIE should regularly update the list of rinderpest-free countries on its website.

***Peste des petits ruminants* (PPR)**

37 Recognizing the risk that PPR may pose in a "post-rinderpest world", a strategy should be developed for progressive control of PPR.

Historical account of rinderpest eradication

38 GREP should gather all rinderpest information and consolidate this in the form of an historical account of rinderpest eradication.

A. BHATIASEVI

Participants, Avian Influenza and Wildlife Regional Surveillance and Research Priorities for Asia International Meeting, Bangkok, Thailand

Avian Influenza and Wildlife Regional Surveillance and Research Priorities for Asia International Meeting – Bangkok, Thailand, 3–5 September 2007

Since 2003, the Food and Agriculture Organization (FAO) of the United Nations, the World Health Organization (WHO), the World Organisation for Animal Health (OIE), the United States Department of Agriculture (USDA), the United States Agency for International Development (USAID), the Wildlife Conservation Society (WCS) and other related organizations have convened meetings on various aspects of highly pathogenic avian influenza (HPAI) surveillance and control.

The role of wild birds in relation to H5N1 HPAI was discussed at the FAO & OIE International Scientific Conference on Avian Influenza and Wild Birds[1] (Rome, Italy 30–31 May 2006). One recommendation from that conference was the necessity for a long-term investment to better understand the interactions between wildlife, livestock and humans.

S. NEWMAN

Researcher at Mahidol University demonstrating AI sampling equipment for wild birds at Beong Borapet Wildlife Sanctuary, September 2007, Thailand

In recognition of the importance of the Asian region to H5N1 HPAI, the impact the disease has had on poultry and wildlife there, and the many groups that have been undertaking a range of work designed to help understand the issues and combat them, an international meeting *Avian Influenza and Wildlife: Regional Surveillance and Research Priorities for Asia* was held in Bangkok, Thailand, between 3 and 5 September 2007. The meeting was jointly convened and co-sponsored by FAO, USDA and WCS. The Mahidol University, Thailand and the Department of National Parks, Wildlife and Plant Conservation, Ministry of Natural Resources and the Environment of Thailand provided great support in the organization of the meeting and field visits.

The meeting convened 90 wildlife experts and organizations concerned with wildlife, conservation and disease control. Government and donor agencies, university researchers and international associations from Asian countries (Bangladesh, Cambodia, China, India, Indonesia, the Lao People's Democratic Republic, Malaysia, Mongolia, Myanmar, Philippines, Thailand and Viet Nam) and international organizations and agencies participated.

T. MUNDKUR

AI sample collection techniques for wild birds at Beong Borapet Wildlife Sanctuary, Thailand

The objectives of the meeting were to: (a) bring together avian, wildlife, veterinary, and disease specialists to encourage coordination and collaboration in the region; (b) gain a better understanding of national needs, regional needs, and priorities; (c) provide an opportunity for Asian countries to share their ongoing wildlife and avian influenza-related activities; and (d) strengthen capacity and increase knowledge about avian influenza and wild birds.

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[1] More information available at: Journal of Wildlife Diseases (http://www.jwildlifedis.org/content/vol43/3_Supplement/index.dtl).

Main outcomes and recommendations[2]

The main outcomes and recommendations of the meeting addressed regional and national priority needs:

A. Regional recommendations

Capacity building

1. Strengthening capacity through implementation of regional training programmes is necessary to support field surveillance and response efforts concerning wild birds; the approach of training-of-trainers to increase capacity is a priority.
2. Regional training and manuals on bird-handling capturing, data management and analysis, specialized techniques (e.g. telemetry, species identification, counting and monitoring techniques, hygiene) are required.
3. Regional laboratory training and diagnostic laboratory support for surveillance and testing of wild birds are needed.

Information sharing and communication

1. A regionally coordinated media strategy on AI and wildlife, regional information protocols (outbreak precautions and response) and awareness promotion are required.
2. Improved regional mechanisms for sharing of experience and best practices on AI surveillance and wild bird studies and provision of accurate and timely information on AI and wild birds are needed.
3. Common approaches to biosecurity relative to wild birds, domestic poultry and the environment are needed.
4. Efforts to improve awareness among national staff, particularly policy makers, about international bilateral and multilateral agreements and initiatives (e.g. Asia Pacific Working Group on Migratory Waterbirds and Avian Influenza, Asian Partnership on Avian Influenza Research Programme, Convention on the Conservation of Migratory Species of Wild Animals, Convention on International Trade in Endangered Species, East Asian-Australasian Flyway Site Network, Global Avian Influenza Network for Surveillance – GAINS, OIE, Ramsar Convention, Scientific Task Force on Migratory Species and Avian Influenza and WHO) and the value of these instruments/ initiatives to support national efforts on wild bird research, conservation and management are required.

[2] More information available at: http://www.fao.org/avianflu/news/bangkok_wild.htm

Data quality and information needs

1 Standardized protocols are needed to respond to investigations of morbidity and mortality in wild birds, in addition to investigation of the role of wild birds in poultry outbreaks.

2 A regional reference centre for isolates from poultry and wild birds is required. A network of reference laboratories already exists but the available datasets for poultry are much larger than for wild birds.

Research and cooperation

A *regional coordinating task force or group* should be established. The task force would, in general, provide advice and direction on:

- research priorities for wild birds for the region;
- the design and conduct of rapid response, surveillance and monitoring programmes for wild birds and how these efforts could be integrated into ongoing work;
- resources (funds, equipment) for emergencies and wild bird die-offs; and
- data sharing and information exchange on a regional scale. This would include data and information on wild birds, materials, supplies and equipment, personnel and projects (past, ongoing and planned) and donors.

FAO, which had recently taken over as co-leader of the "International Scientific Task Force on Avian Influenza and Wild Birds", has been suggested as a potential leader of this regional task force.

S. NEWMAN

Wild bird handling techniques for AI sampling demonstration, Beong Borapet Wildlife Sanctuary, September 2007, Thailand

1 Establishment of a multinational response team to investigate clusters of wild bird morbidity and mortality is needed. This should be supported by the development of a regional/global registry of wild bird specialists to be part of early response teams.

2 Enhanced cooperation in the study of long-distance and short-distance migratory birds that move across country borders as well as in disease surveillance and data sharing within the region are required. There is scope within the Asian Partnership on Avian Influenza Research Programme for such work for research on socio-economic aspects of AI outbreaks and studies on policy making.

3 Identification of priority species for surveillance, recommendations on types of surveillance, criteria for surveillance, increased effort of banding of wild birds, identification of priority sites for surveillance at flyway scale, expansion of the Asian Waterbird Census, regional updates for population estimates for waterbirds to enhance knowledge of wild birds and AI are a high priority. The role of the Asia-Pacific Working Group on Migratory Waterbirds and Avian Influenza in facilitating these activities is recognized.

4 Research and collaboration on cross-border wildlife trade need to be developed to support improved understanding of the links between wildlife trade and spread of diseases.
5 Regional coordination for research on agriculture–wildlife interactions and their relation to AI are required; the value of developing regionally coordinated pilot projects is recognized.
6 Mechanisms to ensure timely issuing of permissions and agreements to transport wild bird samples for AI surveillance out of the country to regional laboratories for testing need to be established.

Planning and implementation
Regular regional meetings to share and exchange information, measure progress and plan future activities regarding wild bird issues will be valuable to organize.

B. National recommendations
Country representatives recommended over 100 actions that have been grouped in the following categories: capacity building, research and cooperation, information sharing and communication, data quality and information needs, and strategic planning.

Capacity building
1 Acknowledging that illegal trade in wild birds is a recognized vector in the spread of H5N1 and other avian diseases, strengthening of national capacity for enforcement of existing legislation on legal and illegal wildlife trade is required. Support from regional and global agencies is also needed.
2 Strengthening of national capacity for laboratory testing of wild bird samples is needed. Support being provided by regional and global agencies and donors to strengthen laboratory capacity for testing of domestic bird samples should be extended to cover wild birds.
3 The capacity of rapid response, monitoring and surveillance teams should be expanded to include trained wild bird specialists and ornithologists to address wild bird issues at farm outbreaks and wild bird die-offs.
4 Additional resources are urgently required to train national field staff and wildlife specialists (including field biologists, wildlife veterinarians, ornithologists and wild bird specialists) to undertake wildlife disease surveillance and field monitoring. Topic areas mentioned include: trapping and handling techniques, species identification, sample collection, processing and marking, banding and morphometrics and field monitoring.
5 The need for training-of-trainers on wildlife disease surveillance and field monitoring techniques to increase capacity in the short term is a priority.

Research and cooperation

1 Improved cooperation between agencies, sectors and multi-disciplinary teams is needed to ensure timely data sharing and information exchange.
2 Research to improve knowledge and information on wild bird populations, trade (legal and illegal) in wild birds, and interactions between wild birds and domestic poultry is required as a priority and needs to be strengthened.

Information sharing and communication

1 Development of coherent national strategies on communication of key messages about wild birds and HPAI is required. Adequate resources, knowledge and information to implement these strategies are also needed.
2 Better sharing and exchange of data and communication of outcomes of ongoing research on migratory birds at the regional and global levels is required to improve outreach and public education campaigns to support efforts of agencies.
3 There is a need to raise public awareness and strengthen media relations to counter the increased threats to wild birds from widespread public misunderstanding, misconceptions and poor media reporting over the last few years.
4 Improved databases and management information system design, infrastructure and interoperability are necessary, as well as strengthening institutions and inter-agency cooperation. These will enable policy makers and the scientific community to receive information in a more timely fashion.
5 Countries would benefit from establishing national review boards on information release policies. The policies should address a range of issues related to data sharing to overcome institutional and other barriers. Policies would need to include: level of control on information access at different stages; improved user-friendly means for communication, standardized report formats; policies and procedures for management of databases and management information systems; permissions and restrictions, etc.

Data quality and information needs

Guidance, direction or advice concerning issues of data quality, reliability, metadata and use-value (i.e. who needs what data in what format and for what purpose) on AI and other diseases is required. A wide range of information gaps that need to be addressed include:

1 Access to information in relation to AI and wild birds, such as:
- AI surveillance results;
- risk assessment on waterbird species;
- trade in wild birds (legal and illegal);
- list of bird species in countries;
- routes of bird migration and local movements;

- timing of bird migrations and local movements or "hot time";
- flyway area of each country for different species;
- species known to have been infected by AI.

2 Basic information about distribution, abundance of wild birds and habitats of wild birds:
- status of waterbird species in each country;
- waterbird migration strategies and biology.

3 Standardized and simplified protocols for:
- selection surveillance sites or "hot spots", and species;
- mechanisms for sharing AI and wild bird information online;
- use of the Asian Waterbird Census as a starting point in bird and habitat data gathering.

4 Knowledge of existing research and administrative bodies conducting and responsible for wild bird activities as well as assessment of current research activities.

Strategic planning

1 More effort is needed on strategic planning for AI control at the national level and for inclusion of wild bird surveillance and related activities in these plans.

2 Discussion and mapping of issues related to political and industry sensitivities is required regarding the release and use of information, responsible use by the media, information gaps, language barriers, incentives and compensation (monetary and other) for sharing and exchanging and data security.

News

FAO Wildlife Disease Programme website

Following the 2005 wild bird H5N1 outbreak in China, ECTAD's Wildlife Disease Programme has been working hard to develop partnerships and implement activities in new areas to understand the linkages between wildlife and domestic poultry.

The website provides a brief introduction to more of the main activities of the Wildlife Disease Programme:

- Capacity building: coordinating and facilitating training of >300 in-country nationals from over 80 countries.
- Disease surveillance: collection and analysis of over 18,000 samples from over 25 countries.

- Telemetry studies: use of state-of-the-art satellite transmitters mounted on birds to better understand their migration routes and possible links to disease movement.
- The global Scientific Task Force on Avian Influenza and Wild Birds that FAO co-convenes with UNEP/CM.
- Information resources: a one-stop point for key wildlife-AI related literature, produced by FAO and its partners.
- Partners: a snapshot of the many new partnerships that FAO is working with on AI and wildlife studies.
- Meetings: major AI-wildlife related meetings and outputs; organized or attended by FAO.
- A media-centre link.

The Wildlife Disease Programme website is available at the following link: http://www.fao.org/avianflu/en/wildlife/index.html

Meetings and publications

Meetings

- Bangkok International Conference on Avian Influenza 2008: Integration from Knowledge to Control, 23–25 January 2008, Bangkok, Thailand.
- FAO/OIE GF-TADs Global Steering Committee, 30 January 2008, Rome, Italy.
- FAO/OIE CMC Steering Committee Meeting, 31 January 2008, Rome, Italy.
- International Symposium on Revolution in Food Safety Management. 13–15 February 2008, Nusa Dua Bali, Indonesia http://www.idfsymposium-bali2008.com/
- Thirteenth meeting of the Subsidiary Body on Scientific, Technical and Technological Advice of the Convention on Biological Diversity, 18–22 February 2008, Rome, Italy.
- FAO/OIE GREP meeting: Rinderpest Accreditation for Near East Countries, 26–28 February 2008, Amman, Jordan.

Publications

FAO Animal production and Health Manual. *Wild bird HPAI Surveillance – Sample collection from healthy, sick and dead birds* (available in Chinese, English, French and Spanish, with Arabic and Russian to follow).

English
http://www.fao.org/docrep/010/a0960e/a0960e00.htm
ftp://ftp.fao.org/docrep/fao/010/a0960e/a0960e00.pdf

French
http://www.fao.org/docrep/010/a0960f/a0960f00.htm
ftp://ftp.fao.org/docrep/fao/010/a0960f/a0960f00.pdf

Spanish
http://www.fao.org/docrep/010/a0960s/a0960s00.htm
ftp://ftp.fao.org/docrep/fao/010/a0960s/a0960s00.pdf

Chinese
http://www.fao.org/docrep/010/a0960c/a0960c00.htm
ftp://ftp.fao.org/docrep/fao/010/a0960c/a0960c.pdf

FAO Animal production and Health Manual. *Wild birds and avian influenza – An introduction to applied field research and disease sampling techniques* (currently available in English only – other language versions being prepared).

English
http://www.fao.org/docrep/010/a1521e/a1521e00.htm
ftp://ftp.fao.org/docrep/fao/010/a1521e/a1521e.pdf

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

New staff

Daniel Beltran-Alcrudo

Daniel Beltran-Alcrudo (DVM, MSc, MPVM) joined EMPRES/GLEWS[1] in October 2007 as a Disease Tracking Officer. On obtaining his veterinary degree from the University of Zaragoza, Spain in 1999, he worked for the British State Veterinary Services during the foot-and-mouth disease crisis and in the control of bovine tuberculosis. In 2003, on finishing an MSc on Veterinary Aquaculture (Institute of Aquaculture in Stirling, the United Kingdom), he worked for two years in technology transfer in the field of genetics and genomics for animal breeding and health. He specialized in population health and public health & zoonoses through a Masters in Preventive Veterinary Medicine (University of California Davis, United States of America). In 2006–07, he worked in the development, implementation and training of Avian Flu School, an international train-the-trainer programme on highly pathogenic avian influenza preparedness and control.

Taej Mundkur

Taej Mundkur (Ph.D.) completed his Masters in Microbiology from the University of Pune and his doctorate in field ecology of coastal and freshwater waterbirds in west India from the University of Saurashtra in India. He worked with Wetlands International for over 17 years to promote development of large-scale international conservation and management frameworks and programmes for waterbirds and their habitats with governments, conventions, NGOs and researchers in the Asia-Pacific region. More recently he has coordinated programmes and networks to understand the relationships of avian influenza and migratory waterbirds. Dr Mundkur joined ECTAD's Wildlife Disease Programme in September 2007 in Rome as Deputy Wildlife Coordinator to assist countries in Asia, Africa and Europe to build networks and capacity to undertake surveillance of wild birds for avian influenza, focusing on the poultry-wild bird interface. He chairs the Asia-Pacific Working Group of Migratory Waterbirds and Avian Influenza that focuses on bringing together information and expertise for surveillance in wild birds and migratory studies, and is co-convening the UNEP-CMS-FAO coordinated Scientific Task Force on Migratory Species and Avian Influenza.

Javier Sanz Alvarez

Javier Sanz Alvarez joined the EMPRES group of the Animal Health Service in November 2007. A graduate of the School of Forest Engineering, Madrid, Spain, he completed his studies with an MBA and a Masters in International Trade. He then worked for five years as a wildlife consultant in environmental projects, mainly related to conservation of wildlife, protected habitat conservation, best-management practices, rural development, Natura 2000 Network, etc. After one year of experience in Algeria as an analyst in international trade, he joined EMPRES both assessing GLEWS in international trade issues and as a wildlife specialist inside the group.

[1] Global Early Warning System.

Contributions from FAO Reference Centres

FAO/OIE World Reference Laboratory for FMD, Pirbright, United Kingdom

Report from FAO World Reference Laboratory for FMD, July–December 2008

Country	No. of samples	Virus isolation in cell culture/ELISA[1]								RT-PCR[6] for FMD (or SVD) virus (where appropriate)		
		FMD[2] virus serotypes					SVD[3] virus	NVD[4]	NT[5]	Positive	Negative	NT
		O	A	C	SAT 1, 2 or 3	Asia 1						
Bhutan	33	7	-	-	-	-	-	-	26	-	28	5
Botswana	6	-	-	-	-	4	-	-	2	-	5	1
Cyprus	270	-	-	-	-	-	-	-	270	-	-	270
Democratic People's Republic of Korea	1	-	-	-	-	1	-	-	-	1	-	-
Egypt[7]	37	-	-	-	-	-	-	-	37	-	7	30
Ethiopia	38	3	-	-	-	-	-	-	35	-	21	17
Iran (Islamic Republic of)	15	9	4	-	-	-	-	-	2	-	15	-
Malaysia	9	6	2	-	-	-	-	-	1	-	9	-
Namibia	5	-	-	-	-	3	-	-	2	-	5	-
Sudan	21	-	-	-	-	-	-	21	-	-	21	-
Turkey	30	17	8	-	-	-	-	5	-	29	1	-
Uganda	31	1	-	-	-	-	-	30	-	5	26	-
United Kingdom	3768	95	-	-	-	-	-	668	3005	98	3107	563
Yemen	29	3	-	-	-	-	-	26	-	17	12	-
Zambia	3	-	-	-	-	3	-	-	-	-	3	-
TOTAL	4296	141	14	-	-	11	-	750	3380	150	3260	886

[1] VI/ELISA: FMD (or SVD) virus serotype identified following virus isolation in cell culture and antigen detection ELISA.
[2] FMD: foot-and-mouth disease.
[3] SVD: swine vesicular disease.
[4] NVD: no FMD, SVD or vesicular stomatitis virus detected.
[5] NT: not tested.
[6] RT-PCR: reverse transcription polymerase chain reaction for FMD (or SVD) viral genome.
[7] Samples from Egypt diagnosed as FMDV type O from sequencing studies.

FAO/OIE World Reference Laboratory for Morbilliviruses, Pirbright, United Kingdom

Report from the FAO World Reference Laboratory for Morbilliviruses, July–December 2008

Country	Species	Number of samples	Disease	Diagnosis technique	Result
Uganda	Ovine, bovine and caprine	42 sera, 57 swabs	Peste-des-petits-ruminants virus	C'ELISA RT-PCR	Positive Positive
United States of America	Bovine sera	21	Rinderpest virus	C'ELISA	Negative
Spain	Dolphin Pilot whale Various tissues		DMV[1]	RT-PCR	Positive Positive
Sweden	Common seal; harbour porpoise; various tissues		PDV[2]	RT-PCR	Negative Negative
Yemen	Various tissues bovine, ovine, caprine		Rinderpest virus	RT-PCR	Negative

[1] Dolphin morbillivirus
[2] Phocine distempervirus

As of June 2008

Stop the press

Information presented in this bulletin concerns animal disease information up to December 2007. Since January 2008, there have been reports of more transboundary animal diseases (TADs) across the world.[1]

Highly pathogenic avian influenza (HPAI) subtype H5N1 was reported for the first time since March 2006 in Israel in domestic poultry (January 2008). The disease continues to be present in Asia in Bangladesh, India, Indonesia and Viet Nam; outbreaks have also been reported in China in both domestic poultry and wild birds (six cases in wild birds were found in Hong Kong). H5N1 infection in wild birds was also reported in Japan (April–May 2008). H5N1 HPAI was reported in domestic poultry in the Lao People's Democratic Republic (February 2008), Pakistan (January 2008–March 2008), the Republic of Korea (April–May 2008) and the Kingdom of Saudi Arabia. Sporadic outbreaks were also reported in Thailand (January 2008). In Africa, the disease continues to be found in Egypt. In Europe, H5N1 HPAI was reported in domestic poultry in Ukraine (January 2008), Turkey (February 2008), and the Russian Federation (April 2008). Cases in wild birds were reported in Ukraine (February 2008), the United Kingdom and Switzerland (February 2008). H7N7 HPAI was reported in the United Kingdom in June 2008.

Low pathogenic avian influenza virus (LPAI) subtype H7N1 was reported in Denmark in April 2008, H5N2 LPAI was reported in the Dominican Republic in March 2008 and H7N3 LPAI was reported in the United States of America in June 2008.

Foot-and-mouth disease (FMD) was reported for the first time since 2005 in Colombia[2] in June 2008. The disease was also reported in Bahrain (O), Botswana (SAT2), China (Asia 1), Ecuador (O), Egypt (O), Lebanon,[3] Mozambique,[2] Namibia (SAT2), Nigeria[2] and Zambia.[2]

Rift Valley fever (RVF) outbreaks were reported in the Departmental Collectivity of Mayotte (France), Madagascar and South Africa.

African swine fever (ASF) occurred in Azerbaijan, the Russian Federation (January 2008) and in the United Republic of Tanzania (February 2008).

Bluetongue continues to be reported in Europe.

Rabies was reported for the first time since 2004 in France, and continuously reported in Uruguay.

Events:

Regional Animal Health Centre/Sub Regional ECTAD Unit, Kathmandu

The Sub Regional ECTAD[4] Unit for the SAARC[5] countries was established in September 2007 at Kathmandu, Nepal. The unit coordinates FAO activities related to avian influenza and other transboundary animal diseases (TADs) in the SAARC countries, analyses animal diseases information in the sub-region and advises on issues of political and strategic importance. The unit liaises regularly with other United Nations' and international agencies working in the sub-region through the coordination mechanisms being put into place within the UN system to address the avian influenza threat. The unit also deals with the international donor community and multilateral agencies to assist avian influenza and other TADs to control activities in the sub-region.

High-Level Conference on World Food Security: the Challenges of Climate Change and Bioenergy: A round table on TADs was held as a part of the HLC sessions.[6]

[1] More information available at the OIE–WAHID website: http://www.oie.int/wahid-prod/public.php?page=home
[2] Not typed.
[3] Not sampled.
[4] Emergency Centre for Transboundary Animal Diseases.
[5] South Asian Association for Regional Cooperation. More information available at: http://www.saarc-sec.org/main.php
[6] More information available at: http://www.fao.org/foodclimate/hlc-home/en/ and http://www.fao.org/fileadmin/user_upload/foodclimate/HLCdocs/HLC08-bak-4-E.pdf

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