ECTAD: FAO's response to animal disease emergencies

The Emergency Centre for Transboundary Animal Disease Operations (ECTAD) is the Food and Agriculture Organization of the United Nations (FAO) corporate centre for responding to the threat of transboundary animal health crises through the planning and delivery of veterinary assistance to FAO Member Countries.

ECTAD was set up in 2004 to complement the Emergency Prevention System for Transboundary Animal and Plant Pests and Diseases (EMPRES) and strengthen FAO's capacity to respond to the Highly Pathogenic Avian Influenza (HPAI) crisis in a coordinated manner. In line with the One World, One Health framework, the scope of ECTAD now goes well beyond HPAI to include all major transboundary animal diseases and evolving disease situations with probable consequences for animal and human health.

ECTAD, a combined effort of FAO's Animal Production and Health Division and Emergency Operations and Rehabilitation Division, unites FAO's wealth of technical expertise and operational capacity within a holistic approach to animal health.

Highly Pathogenic Avian Influenza and beyond

FAO’s response

Towards One World, One Health
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Towards One World, One Health
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Highly Pathogenic Avian Influenza (HPAI) virus subtype H5N1 has devastated domestic poultry production in numerous countries throughout the world. The deaths of several hundred people caused by this disease showed that it is also highly pathogenic in humans. The virus can acquire new characteristics of infectiousness for humans and could cause a pandemic.

Controlling the H5N1 virus in livestock farms has been the priority action of governments and specialized bodies such as the Food and Agriculture Organization of the United Nations (FAO) and the World Organisation for Animal Health (OIE). Awareness-raising campaigns among veterinary services have led to more efficient epidemiological surveillance systems, which have allowed early detection and the total elimination of outbreaks in most countries. Further efforts must be made, however, in order to eliminate the disease globally.

Five years of efforts to combat HPAI have taught many lessons. In order to be efficient, prevention and control programmes must rely on veterinary services provided with the appropriate resources and supported by strong policy. Control strategies must apply the FAO and OIE international standards. Animal health systems must be based on strong partnerships between public and private sector producers and traders operating throughout the marketing chain, from the farm to the consumer. Adequate biosecurity measures in livestock farms and markets and timely communication actions must also be implemented.

It may not be possible to easily eliminate H5N1 HPAI at the global level in the short term, but it can certainly be efficiently controlled by implementing proven strategies adapted to national socio-economic environments.

HPAI is a typical example of new diseases that are emerging and circulating as a result of global changes. Globalization and the increase in the movement of humans, animals and animal products, changes in climate and in natural and cultivated ecosystems, and demographic changes, including accelerated urbanization, changing consumer food habits, and intensified production systems to respond to increases in consumption are contributing to the emergence of new diseases.

The number of emerging diseases has been growing for around ten years. Some are communicable to humans and highly infectious, thus causing major concern.

The protection of public health and farmers’ livelihoods, especially those of the most vulnerable, as well as trade security services and rural development in poor countries must continue to be an international priority. In 2008, a new global approach called “One World, One Health” was defined by the four international technical agencies, i.e. FAO, the World Health Organization, OIE and the United Nations Children’s Fund, as well as the World Bank and the United Nations System Influenza Coordination. This strategic framework involves multidisciplinary interaction among the public health, animal health, wildlife and national and cultivated ecosystems sectors.

The general mobilization carried out since 2004 in response to the H5N1 HPAI outbreak must continue at all levels. Efforts must also be made to anticipate outbreaks of important health crises in order to prevent major health, economic and social impacts.

Dr Joseph Domenech
Chief Animal Health Service
Chief Veterinary Officer, FAO
ECTAD units provide countries with expertise in the following areas:

- epidemiology;
- preparedness and contingency planning;
- disease surveillance and control;
- veterinary laboratories;
- animal production;
- socio-economic impact of animal diseases;
- outbreak communication; and
- project management and operational support.

Currently, the programme employs more than 470 people throughout the world. Over 75 percent of the overall ECTAD personnel are based in the field.

**Thematic approach**

In addition to country-specific activities to which the majority of funds are allocated, 15 percent of ECTAD funds are allocated to global thematic and transversal activities, covering: communication, wildlife, the Global Early Warning and Response System for Transboundary Animal Disease (GELWIS), the joint World Organisation for Animal Health (OIE)-FAO Network of Reference Laboratories, Epidemiology Centres and Groups of Experts on Animal Influenza (OFFLU), socio economics, biosecurity, poultry production and biodiversity analysis, as well as the Crisis Management Centre – Animal Health (CMC-AH), ECTAD’s rapid response capacity.

**Global assistance**

Since December 2004, ECTAD has assisted over 90 countries in their response to HPAI. Activities in Asia account for more than half of its overall operations.

Under the direct responsibility of the FAO Chief Veterinary Officer (CVO) and of the ECTAD team at FAO headquarters, and in close cooperation with partners, FAO has established one ECTAD regional unit for Asia (Bangkok) and seven subregional units: South Asia (Kathmandu), the Near East (Beirut), North Africa (Tunis), West and Central Africa (Bamako), East Africa (Nairobi), Southern Africa (Gaborone) and Latin America (Panama). ECTAD has also set up smaller units worldwide, based in FAO Representations and government offices.

ECTAD has helped to refurbish laboratories with laboratory equipment and veterinary supplies, and train national veterinarians and laboratory technicians in the most advanced techniques and strategies for the surveillance and control of HPAI. ECTAD has also supported regional networking initiatives to encourage countries and organizations to share information and experiences and to build a unified defence system against HPAI.

In countries where Avian Influenza (AI) has become endemic, or could easily become endemic more targeted approaches have been developed to combat HPAI. Socio-economic studies have been conducted in many countries, for example in Egypt and Indonesia, to help shed light on these factors.

**An evolving tool in the fight against emerging threats**

In view of the increased prevalence of emerging infectious diseases (EIDs), the continued risks posed by HPAI and the longstanding threats caused by other TADs, FAO remains dedicated to supporting Member Countries in their fight to prevent and control animal diseases at their source. Through ECTAD and EMPRES initiatives, FAO is working within international frameworks such as the Global Framework for the Progressive Control of Transboundary Animal Diseases (GF-TADs) and the newly established One World, One Health (OWOH) initiative to promote a collaborative approach to investigation at the animal–human –ecosystems interface and a coordinated effort for rapid response to EIDs.

**Donor support**

FAO’s response to HPAI is made possible through funding from a variety of donors, contributing either to specific projects or through FAO’s Special Fund for Emergency and Rehabilitation Activities (SFERA) earmarked for HPAI. As of July 2009, donor funding had reached some USD 280 million in support of FAO’s Global Programme for the control and eradication of HPAI.

**22 donor countries:** Australia, the Kingdom of Belgium, Canada, the People’s Republic of China, the French Republic, the Federal Republic of Germany, the Hellenic Republic, Ireland, the Republic of Italy, Japan, the Hashemite Kingdom of Jordan, the Federal Democratic Republic of Nepal, the Kingdom of the Netherlands, New Zealand, the Kingdom of Norway, the Kingdom of Saudi Arabia, the Kingdom of Spain, the Kingdom of Sweden, the Swiss Confederation, the United Kingdom of Great Britain and Northern Ireland, the United States of America and the Socialist Republic of Viet Nam.

**10 international and regional organizations:** the Asian Development Bank, the European Commission, the International Livestock Research Institute, the Office for the Coordination of United Nations Assistance Programme to Afghanistan, the Organization of the Petroleum Exporting Countries (OPEC), the United Nations Common Fund for Humanitarian Action in Sudan, the United Nations Development Programme (UNDP), the UNDP Administered Donor Joint Trust Fund, the United Nations Development Group/EEXECOM Secretariat and the World Bank.

FAO’s SFERA earmarked for HPAI has paved the way for a programmatic approach and has greatly improved FAO’s flexibility to respond. Donors supporting ECTAD and EMPRES through the SFERA include: the People’s Republic of China, the French Republic, the Hellenic Republic, the Hashemite Kingdom of Jordan, the Kingdom of Norway, OPEC, the Kingdom of Saudi Arabia, the Kingdom of Sweden, the Swiss Confederation and the United Kingdom of Great Britain and Northern Ireland.
One World, One Health
A strategic framework for reducing risks of infectious diseases at the animal–human–ecosystems interface

In response to the ongoing problem of HPAI and other EIDs, FAO, OIE, the World Health Organization (WHO), the United Nations Children’s Fund (UNICEF), the World Bank and the United Nations System Influenza Coordination (UNUSIC) jointly developed a strategic framework, entitled “Contributing to One World, One Health – A Strategic Framework for Reducing Risks of Infectious Diseases at the Animal–Human–Ecosystems Interface”. This Framework identifies key issues related to the control of HPAI and other EIDs of animals and humans that have potential, wide-ranging impacts at the global level. It also articulates a medium- to long-term strategy to address these problems.

Humanity faces many challenges that require global solutions. One of these is the continued evolution and emergence of new infectious diseases. The exponential growth in human and livestock populations, urbanization, rapidly changing farming systems, closer integration between livestock and wildlife, forest encroachment, climate change, changes in ecosystems, increased air travel and the globalization of trade in animal and animal products are contributing to the emergence of new diseases.

The consequences of EIDs can be catastrophic and economic losses tremendous. Despite remarkable advances in medical research and treatments during the twentieth century, infectious diseases remain among the leading causes of death worldwide. The economic losses caused by H5N1 HPAI are estimated at over USD 20 billion. If it becomes a pandemic, it could cost the global economy some USD 2 trillion. Investments in preventive and control strategies are, therefore, likely to be highly cost effective.

Concerns about the potential for a pandemic have spurred worldwide efforts to control the H5N1 virus subtype. The virus spread out of the People’s Republic of China in late 2003 into the rest of Asia, then Europe and Africa. The success of these control efforts is reflected in the fact that over 50 of the 62 countries affected by the virus have managed to control or eliminate it. H5N1 HPAI remains entrenched in several countries and still has the potential to cause a pandemic. The possibility of a pandemic resulting from a reassortment with the currently circulating novel A/H1N1 virus is a recent additional cause for concern.

Participants in the International Ministerial Conference on Avian and Pandemic Influenza (New Delhi, December 2007) recommended that the international community draw on the experiences of HPAI and develop a medium-term strategic framework to address EIDs. It was agreed that a better understanding is needed of the drivers and causes of the emergence and spread of infectious diseases under the broad perspective of OWH principles that acknowledges the complex nature of EIDs and promotes a broad multidisciplinary and multisectoral collaboration across these principal health domains at the animal–human–ecosystems interface.

The Strategic Framework focuses on EIDs at the animal–human–ecosystems interface, where there is the potential for epidemics and pandemics that could result in wide-ranging impacts at the international, regional and country levels. The objective of the Framework is to diminish the risk and minimize the global impact of epidemics and pandemics resulting from EIDs by enhancing disease intelligence, surveillance and emergency response systems at the national, regional and international levels and by supporting them through strong and stable public and animal health services and effective national communication strategies. National authorities play a key role in developing, financing and implementing these interventions. Successful implementation will contribute significantly to the overall goal of improving public health, food safety and security and the livelihoods of poor farming communities, as well as protecting the health of ecosystems.

The overall objective of the Strategic Framework represents an international public good. Its achievement will involve strengthening the existing animal and public health surveillance, response, prevention and preparedness systems at the country, regional and international levels.

Priority interventions and associated actions will be established and prioritized at the country level. They will be identified based on known areas of risk (“hotspots”) for disease emergence and on research findings that point to new risks. The Strategic Framework does not propose prioritization of diseases to target. Instead, it will benefit poor communities and the agriculture sector by reducing the risk of infectious diseases that are locally important, e.g. Rift Valley fever (RVF), tuberculosis, brucellosis, rabies, foot-and-mouth disease, African swine fever and pest of small ruminants (pests). Investments in this area will not only control existing and often neglected infectious diseases, but will also promote surveillance for EIDs at a grassroots level by embedding global concerns within a local context.

Based on these considerations, six specific objectives have been identified as areas for priority emphasis by national authorities:

- develop international, regional and national capacity in surveillance, making use of international standards, tools and monitoring processes;
- ensure adequate international, regional and national capacity in public and animal health – including communication strategies – to prevent, detect and respond to disease outbreaks;
- ensure functioning national emergency response capacity, as well as a global rapid response support capacity;
- promote interagency and cross-sectoral collaboration and partnerships;
- control HPAI and other existing and potentially re-emerging infectious diseases; and
- conduct strategic research.

Implementation of the Strategic Framework will be guided by key principles. These include the adoption of a multidisciplinary, multinational and multisectoral approach and the integration of technical, social, political, policy and regulatory issues and the establishment of broad-based partnerships across sectors and along the research-to-delivery continuum. They will include engagement of wildlife and ecosystems stakeholders, the human and veterinary medical community and advanced research institutions (ARIAs).

National authorities will be encouraged to create dedicated OWH Units to build on national strategies on EIDs, engage with the private sector to strengthen local capacity and promote long-term sustainability. This would include reinforcing existing institutions. In addition, mechanisms and partnerships that have been developed in response to the HPAI crisis among international agencies (FAO, OIE, WHO and UNICEF) such as UNUSIC, GLEWS, GF-TADs and CMCA-H, as well as those developed between the public and animal health sectors, will be further strengthened. This would be done without encouraging the integration or fusion of their roles. The Strategic Framework will encourage the formation of a flexible and informal network of partners and will promote pro-poor actions and interventions.

In considering options for financing implementation, key issues to be addressed include the best benefit of various options, the long-term sustainability, public versus private goods and political commitment on the part of the key stakeholders. Donor funding will be sought, including a combination of grants and loans.

This joint Strategic Framework has been presented as a consultation document at the One World, One Health: From ideas to action held in Brighton, United Kingdom in October 2008. It has been discussed and endorsed in principal by high-level participants from countries, international technical agencies, regional organizations, ARIs, donors and the private sector. The Framework has been subsequently acclaimed and further endorsed during other international meetings, such as the meeting on “One World, One Health – From principles to action” held in Brighton, United Kingdom in February 2009 and the meeting on “One World, One Health – From ideas to action” organized by the Public Health Agency of Canada in Winnipeg in March 2009.
Global strategies to prevent and control HPAI

The success of any global strategy for animal disease control is measured at the local level. The prevention and control of HPAI must take into account local circumstances, livestock production and marketing practices, census and demographics, customs and traditions, economies and governing structures.

No single measure can solve or eliminate HPAI. Addressing the HPAI problem requires a balanced mix and integration of various tools. This, however, is contingent on strong political commitment, effective and well structured veterinary services having adequate resources and a strong public-private partnership.

Surveillance is fundamental to all disease control efforts. It involves the systematic and ongoing collection, collation and analysis of information related to HPAI and the timely dissemination of such information to decision-makers. A global surveillance mechanism capable of bringing together and adding intelligence to the national and regional surveillance data is also essential. Targeted surveillance in specific, identified risk points and in disease ‘hotspots’ requires fewer resources but can provide valuable clues. Surveillance of HPAI in animals is the basis for human risk control. Differential diagnosis with Newcastle disease, which is endemic in many countries, is critical in HPAI surveillance.

Laboratory diagnosis is the indispensable means to confirm HPAI infections.

The best way to initially respond to an outbreak is to stamp out all infected and in-contact birds, followed by decontamination of the premises to prevent the spread of the disease. A key strategy for a rapid and effective response is to have a fair, timely, transparent and well-publicized compensation policy. Poultry breeders, including smallholders, are more likely to report outbreaks if they are assured of a fair and timely compensation. In the absence of an acceptable compensation scheme, poultry breeders are likely to sell their poultry quickly to avoid further losses and thus spread the disease further, particularly through live bird markets.

Biosecurity is the implementation of measures that reduce the risk of the introduction and spread of disease agents. It requires the adoption of a set of attitudes and behaviours in all activities involving domestic, captive exotic and wild birds and their products. The application of biosecurity measures can limit the spread of HPAI as human actions are mainly responsible for its spread. Biosecurity measures include three main components: segregation, cleaning and disinfection. The timely application of all three is essential for a proactive, preventive impact and does not necessarily require a significant investment. Segregation reduces the possibility of infection entering the farm. It is the most important phase. Cleaning will remove most contamination and disinfection will deactivate any remaining virus.

Vaccination is recommended as an additional tool to control HPAI, particularly in countries where stamping out cannot be carried out for social or economic reasons and where the disease is endemic and widely spread. Vaccination protects against clinical disease and reduces mortality, virus shedding and the risk of transmission to humans. High vaccination coverage either in the option of massive blanket vaccination schemes or in the selected (targeted) sub-populations to be vaccinated is necessary. The management of mass vaccination campaigns requires thorough planning and budgeting. Achieving high vaccination coverage while facing logistics constraints and a lack of financial and human resources remains a challenge.

The steady evolution of the H5N1 HPAI virus requires close monitoring of the efficacy of existing vaccines with the aim of detecting and addressing a possible circulation of escape variants in vaccinated populations. The sustainability and feasibility of mass vaccination campaigns against AI have shown to be variable, being very successful during three years in Viet Nam or in parts of the People’s Republic of China, making a targeted approach preferable in other countries. This should be based on prevailing circumstances and the results of appropriate risk assessments.

Communication strategies are essential to inform poultry keepers, other stakeholders and the general public about health threats arising from HPAI. Well-prepared outbreak communication is crucial to increase awareness among the public, producers and other stakeholders. These strategies are required to promote preventative behaviours at the community and household levels and ensure the successful application of surveillance/control/vaccination measures. Communication across countries is also crucial for building trust and collaboration for regional and international HPAI control.

Governments should be prepared to change and adapt their policies in order to reduce and mitigate the impact of HPAI and update control measures as the situation evolves. All countries should have their preparedness plans tested and regularly updated. Biosecurity, surveillance and compensation issues should be frequently reviewed in light of experience gathered and lessons learned.

Partnerships with the private sector particularly with producers and traders but also private enterprises (i.e. pharmaceutical companies, feed producers, etc.) are important in the field of surveillance, husbandry practices and communication as well as with non-governmental groups, research institutions and reference centres.

When a government requests CMC-AH support to deal with an emerging animal disease threat, the CMC-AH deploys a team of experts to work with the host government to assess the epidemiological situation, complement the capacities of national veterinary services, support immediate response activities (i.e. disease control, surveillance, sample collection, training and outbreak communication) and provide technical advice on how to best respond to the situation. CMC-AH rapid support also includes the development of emergency action plans for concrete next steps and emergency funding packages to kick-start response activities on the ground. CMC-AH missions also help governments facilitate cross-border dialogue and ensure stakeholder coordination, while working in close coordination with WHO and public health partners when responding to zoonotic threats.

Mission follow-up and dynamic assistance

Before a rapid mission is concluded, the CMC-AH begins working in-country with the relevant partners and donors to mobilize additional resources and support follow-up activities and assistance. CMC-AH transition efforts aim to connect rapid response support to medium- and longer-term initiatives. In this way, FAO works to ensure that disease control strategies and national capacities enhanced in the immediate term can continue to be strengthened for improved response in the future.

In October 2006 to help Member countries respond to TAD worldwide with experts at FAO headquarters and in the field by EMPRES, the MC-ah reviews evolving disease threats. CMC-AH is operated under the overall supervision of FAO’s CVo. Being a part of ECTAD enables the MC-ah to draw on FAO’s vast animal health technical expertise and beyond FAO, working closely with OIE, WHO, specialized technical agencies and research institutions, various donors and other partners to promote a holistic approach to rapid TAD response, with an emphasis on animal and public health collaboration. In this way, the CMC-AH provides the technical assistance and operational support required to assist Member Countries in fighting HPAI and other TADs at their source.

Rapid response: how it works

The FAO/OIE/WHO GLEWS provides the CMC-AH with up-to-date and wide-ranging information on the global disease situation. Through direct links with GLEWS, provided by EMPRES, the CMC-AH reviews evolving disease threats worldwide with experts at FAO headquarters and in the field to anticipate where CMC-AH services may be required.

Crisis Management Centre - Animal Health

FAO’s rapid response unit for animal health emergencies

The FAO, in collaboration with the OIE, established the CMC-AH in October 2006 to help Member Countries respond to TAD emergencies and critical epidemiologic situations through rapid response missions and coordinated follow-up support. The CMC-AH serves as the rapid response platform for CMC-AH transition efforts aim to working in-country with the relevant partners and donors to mobilize additional resources and support immediate response activities (i.e. disease control, surveillance, sample collection, training and outbreak communication) and provide technical advice on how to best respond to the situation. CMC-AH rapid support also includes the development of emergency action plans for concrete next steps and emergency funding packages to kick-start response activities on the ground. CMC-AH missions also help governments facilitate cross-border dialogue and ensure stakeholder coordination, while working in close coordination with WHO and public health partners when responding to zoonotic threats.

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The panzootic H5N1 virus originated in southern China with the first characterization as H5N1 HPai observed in a goose in 1996. The virus was seen to fatally affect humans when outbreaks occurred in Hong Kong in 1997. Between 1997 and 2003, the spread of the H5N1 virus remains unclear, but sometime in 2003 it gained a foothold in several countries across Southeast Asia. Subsequently, and remains unclear, but sometime in 2003 it gained a foothold in several countries. This has been repeatedly shown in Asia, and disease or death is not uncommon. Domestic duck production – especially in open grazing systems – turned out to be key in the maintenance cycle of the virus in nature and disease or death is not uncommon. Domestic duck production – especially in open grazing systems – turned out to be key in the maintenance cycle of the virus in nature. Many AI viruses have been found in wild birds, but are not seen to be harmful. However, natural AI viruses may gain in virulence when cycled through susceptible poultry. Many wild birds were found to be susceptible to H5N1, and disease or death is not uncommon. Domestic duck production – especially in open grazing systems – turned out to be key in the maintenance cycle of the virus in nature. Many wild birds were found to be susceptible to H5N1, and disease or death is not uncommon. Domestic duck production – especially in open grazing systems – turned out to be key in the maintenance cycle of the virus in nature. The H5N1 virus has been reported to infect over 60 countries and 80 species of birds, and to spill over into several mammalian species, including humans. Given that H5N1 continues to circulate in around five countries, the pandemic risk prevails and continued vigilance is therefore required. The role of pigs in H5N1 infections or persistence does not appear to be important to-date, but avian viruses may readily show up and reassert in pigs. Stepping up influenza surveillance in both poultry and pigs is a high priority in countries with large pig and poultry populations. Wild domestic cats are highly susceptible to H5N1 through the ingestion of infected chicken carcasses and thus, in turn, become infectious to other susceptible animals. H5N1 transmission and spread are correlated with intensive commercial production and marketing practices, poor hygiene at the market place and the mixing of different species of birds. The market chains include hatcheries, growers, distributors, egg collectors and feed suppliers, among others, making a disease such as H5N1 HPai difficult to contain.

The epidemiology of Avian Influenza

Importance of the poultry sector

The poultry sector is the fastest growing and most flexible of all livestock sectors. Aided by technological advances in production, processing and marketing, annual growth in poultry production has outstripped all other agricultural commodities for many years. Poultry meat production is the most efficient way of producing meat in intensive production systems as it has the lowest feed conversion ratio of all common domestic species. Over the past two decades, the sector has expanded, consolidated and globalized, driven primarily by very strong demand for poultry products. This demand has grown in countries of all income levels, although the largest increase has been in nations with an expanding middle class, given that an increase in protein consumption is one of the first indicators of more disposable income. However, the sector faces considerable and multiple challenges, such as industry integration, linkages to the spread of animal diseases in certain conditions of poor biosecurity and environmental impact. Overcoming these will require entrepreneurship and flexibility among all actors in the sector if they are to continue to participate in this dynamic market. Poultry is also an important source of income and food for a majority of rural families. Worldwide, 700 million poor people depend entirely or partially on animal production for their subsistence and poultry raising is often a key part of this. For example, 65 percent of rural families in Viet Nam and 90 percent of rural families in Egypt and Cambodia keep poultry. Two-thirds of the eggs consumed in Bangladesh are produced by backyard chickens. Livestock offers one of the few rapidly growing markets that rural people can join, even if they lack substantial amounts of land, training and capital, because the poultry value chain does not have many barriers to the entry or exit of smallholders. Small-scale and backyard poultry production enables people to earn an income from animals feeding on common property or fed household waste. Notwithstanding its rapid growth, the sector continues to be very diverse in structural terms. There are and will continue at least in the mid term to be traditional small-scale, rural, family-based poultry systems, which play a crucial role in sustaining livelihoods and, importantly, in supporting women farmers. As long as there is rural poverty, the poultry sector will offer opportunities for income generation and ensuring access to quality human nutrition. Although HPai has been a big shock to the industry, it is by no means the only external pressure faced. Concerns about environmental pollution, water shortages, the rising cost of feed and improving welfare standards are all placing pressure on the livestock sector, including poultry. Although HPai has been a big shock to the industry, it is by no means the only external pressure faced. Concerns about environmental pollution, water shortages, the rising cost of feed and improving welfare standards are all placing pressure on the livestock sector, including poultry. However, efforts to contain HPai and reduce its impact have accelerated moves towards dividing and differentiating production systems and value chains. These concerns can then be addressed more specifically within each production system.

The world has never experienced an HPai virus that has spread so rapidly across continents and countries. Many AI viruses have been found in wild birds, but are not seen to be harmful. However, these natural AI viruses may gain in virulence when cycled through susceptible poultry. The epidemiology of Avian Influenza Importance of the poultry sector

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Situation of HPAI and emerging lessons

HPAI will not be eradicated in the short term. However, it certainly can be eliminated from the poultry sector if better practices in husbandry and marketing are implemented and the regulatory authorities take necessary measures to improve animal health and secure livelihoods. Governments need to create an enabling policy environment in which the private sector is encouraged to adopt better production and market standards.

So far, a new human influenza pandemic has not occurred, yet the possibility of it emerging remains a constant threat. The potential for the H5N1 HPAI virus to become reassorted with the novel A/H1N1 virus currently circulating in humans is an additional cause for concern. Continued vigilance is thus required through continued public information and communication interventions; the reinforcement of surveillance and early reporting systems; the availability of good laboratory diagnostic structures and capacities; and ensuring that a rapid and effective response is rolled out immediately if a human influenza pandemic were to emerge.

So far, WHO has not elevated the risk level. Of the 62 countries that have reported H5N1 infection in poultry and/or in wild birds since 2004, active virus transmission in poultry remains in few countries. These include Egypt and Indonesia, where over 80 percent of all outbreaks are reported. In 2009, eight countries reported the infection in poultry, with Nepal reporting outbreaks for the first time.

Costs of HPAI outbreaks and benefits of controlling HPAI

HPAI outbreaks and their control impact individual households and national economies. Direct costs from HPAI outbreaks result from the death of birds and consequent loss of production and the costs of implementing culling, disposal, compensation schemes, movement restriction and vaccination. Indirect costs can compound the situation through additional costs in biosecurity or preventive health measures, or through revenue foregone by being denied access to markets or market shock.

In many countries, compensation is now paid to farmers when birds are culled, although it rarely recovers for the value of lost birds and income losses.

The costs of vaccination in commercial poultry are largely borne by the farmers. The vaccination costs of backyard flocks are relatively high and must be heavily subsidized as backyard farmers usually have limited financial incentives.

In 2007, estimates for providing a single dose of vaccine to a chicken ranged from USD 0.04 to USD 0.15. The cost of the vaccine, the vaccinator and the cold chain made up between 63 percent and 90 percent of this total. Commercial producers often pay for these components. Post-vaccination monitoring, communication and regulation are provided by the government.

Indirect costs can be many times higher than direct costs and are usually underestimated. They include market shocks, wider livelihood impacts beyond the immediate loss of birds and opportunity costs.

Wider livelihood impacts have largely been felt by women who have lost small flocks. The contribution of poultry to the incomes of poor households varies from approximately 3 percent to over 40 percent. Their loss affects household nutrition, children’s education, dowries and social obligations.

The benefits of controlling H5N1 HPAI can be considered on three scales. Globally, the prevention of a human influenza pandemic could prevent the loss of billions or trillions of dollars and enormous suffering. Within the global poultry sector, there would be a benefit in removing a destabilizing element in international markets so that production and trade value can continue. For individual exporting countries, control offers the possibility to recover lost markets, albeit against strong competition, and to provide a stable supply of products for growing domestic urban markets. For individual producers on all scales, protection of their asset is the primary benefit.

By using control measures covering a wider range of diseases, the benefits for all stakeholders in the poultry sector will increase. These would comprise hygiene improvements along the poultry supply chain and surveillance for several common and financially important diseases with feedback and advice to producers. Increased private benefits for stakeholders in the poultry sector will at the same time increase the global public health benefits from HPAI control through the higher disease control incentive of stakeholders in the poultry sector.
HPAI and wild birds

Legal and illegal trade of poultry and poultry products and unintentional movement of H5N1 HPAI by humans are the most important source of disease movement. However, since 2005, wild bird migrations have also spread the disease. The extent to which free-flying wild birds contribute to sustaining and spreading the disease has been an area of intensive study since the emergence of H5N1 HPAI in 2003. Close interactions between domestic poultry and wild birds exist in Asia, Africa, and Europe, demonstrating that H5N1 HPAI virus movement between them is difficult. This virus has now been isolated from over 90 species from 14 orders of wild birds, indicating likely spill-over from domestic to wild birds. At this point in time, the virus is likely circulating in wild birds, indicating likely spill-over from domestic to wild birds. This emphasizes the importance of targeted wild bird surveillance to understand the role they play in the epidemiology of outbreaks in poultry farms and in their natural wildlife habitats. Unfortunately, relatively few countries are currently implementing these types of activities due to financial, technical, or human resource and expertise limitations.

Recommendations from the FAO/OIE International Scientific Conference on Avian Influenza and Wild Birds hosted at FAO headquarters in Rome (May 2006) included the need to improve our understanding of wild bird behavior and migratory routes.

Since 2006, the EMPRES Wildlife Unit has coordinated, facilitated or conducted the training of over 1,000 in-country nationals from more than 100 countries on wildlife disease surveillance. These training activities aim to provide the capacity and skills needed for wildlife surveillance, capture and handling and the diagnostics required to objectively investigate and evaluate the role wildlife may play in disease outbreaks in these countries.

While the impact of the trade (illegal and legal) of wild birds in virus spread is difficult to monitor, the demand for birds used in traditional or religious practices, ornamental species, falconry activities and the intercontinental exchange of meat and feathers are examples of activities that can disseminate the H5N1 HPAI virus or other pathogens.

In December 2008, a taskforce hosted at FAO/EMPRES wildlife headquarter in Rome (October 2008) included the need to improve our understanding of wild bird behavior and migratory routes. This taskforce is co-convened by FAO’s EMPRES Wildlife Unit and will focus on wildlife diseases of increasing international concern. Lessons learned from the H5N1 HPAI experience will be used to address other wildlife diseases that threaten human health, agricultural livelihoods and the conservation of species.
The ECTAD Communication Unit has been active in the provision of technical assistance and building capacities for communication planning, where the emphasis has been on strengthening the technical capacities and competencies of Ministries of Agriculture/Livestock in a number of at-risk countries in outbreak, risk and behaviour-change communication. It has taken a multidisciplinary approach, through collaborating closely with epidemiology, biosecurity and socio-economics experts. Regional multidisciplinary workshops in communication planning and skill-building for HPAI prevention and control have been held for North Africa, West and Central Africa, East Africa and Central Asia, involving 40 countries and over 100 participants and partners.

FAO has also provided technical inputs, helped to develop AI training packages in several countries and been involved in ‘training of trainers’ programmes at national and subnational levels. Many of these training packages have been joint initiatives with partners such as UNICEF, WHO, CARE, the Community-Based Avian Influenza Control project in Indonesia and the Academy for Educational Development, in collaboration with the government departments and institutions of many countries.

FAO established the ECTAD Communication Unit to respond to new demands for strategic policy guidance and technical assistance in animal health communication. Since its inception in June 2007, the Unit has established itself as a critical technical support unit for ECTAD activities in general, and for the provision of specific, needs-based technical assistance in strategic animal health communication for risk reduction to Ministries of Agriculture/Livestock in HPAI-infected and at-risk countries. Recently, the Unit has also expanded its scope of work beyond H5N1 HPAI to include many other TADs and EDs such as A/H1N1, brucellosis, RVF and rabies, to name a few. Furthermore, the Unit is involved in the development and implementation of two major AI-related projects, namely Public Private Partnerships and Biosafety/Decontamination.

The ECTAD Communication Unit comprises communication and advocacy specialists at FAO headquarters in Rome, regional communication advisers for Southeast Asia (Bangkok) and West Africa (Bamako), and in-country specialists in Cambodia, Egypt, Indonesia, the Lao People’s Democratic Republic and Nigeria. Further expansion of the team is envisaged in 2009-2010.

Along with its key communication partners, including WHO, UNICEF, OIE, the World Bank and others, the ECTAD Communication Unit has carried out reviews of numerous knowledge, attitude and practice research studies in HPAI-affected or at-risk countries to better understand the underlying dynamics of community/individual beliefs and behaviour, and to incorporate this knowledge into community-based approaches to strategic communication for the prevention and control of HPAI.

Innovative participatory communication interventions have been developed and are being carried out in Cambodia, Indonesia, the Lao People’s Democratic Republic, Nigeria and Viet Nam. These activities range from the training of village animal health workers as communicators at the community level, to community forums enabling community members to increase their capacity for decision-making to combat AI, to devising sustainable biosecurity measures for resource-poor settings through the use of participatory communication methodologies.

Community awareness activities have been conducted in hundreds of villages and reached thousands of farmers to inform and educate poultry producers and villagers on HPAI, its means of transmission, ways of reducing risk, and prevention and control measures. FAO, along with other partners, has also produced a wide range of in-country communication material, including posters, leaflets, flip-charts and newsletters.

FAO recognizes the crucial role that media can play in setting the global and national development and policy agenda. Besides keeping the media informed through regular media releases and a web site dedicated to AI, FAO is also piloting an innovative media fellowships programme focusing on animal health issues and community voices in Egypt, Indonesia, Nigeria and Viet Nam.
Reforming the poultry sector means regulating or otherwise controlling how or where production, sales, and marketing can take place. Moving a live bird market, closing the slaughter points in an area and banning the production of poultry in a city are all restructuring activities. Another example is introducing a ‘compartment’, which is a population of birds under a common and very well regulated biosecurity plan, like the vertically integrated market chain of a global company.

Restructuring is currently receiving a great deal of attention because it is seen as a way of improving the biosecurity of the poultry sector. Well designed and implemented restructuring activities can certainly be helpful in producing safer poultry. However under some circumstances, this can create competition and inequality, with the most vulnerable people suffering a loss of livelihood. It can also be difficult to regulate.

Various restructuring activities in some countries, introduced or planned since 2003, have had the following results:

- A large proportion of small-scale producers in one area has lost its market and moved out of poultry production. Those who were able to comply with new regulations and remain are mostly making a greater profit than before.
- After very abrupt banning of production, a number of poor families suffered the loss of income, and the dynamic within households changed when women lost their independent livelihood activity. The ban only worked for a while, and many people have partially restocked.
- A market that was upgraded for hygienic reasons after a long consultation with stakeholders is now showing a good return on investment to the municipality that runs it.
- An assessment of one restructuring plan suggested that there would be considerable problems associated with land tenure. Apart from making it difficult to implement, this would have gender implications as women had limited possibilities to own land.

When restructuring is being considered as part of a plan to reduce human and animal disease risk in the poultry sector, it is recommended that it be given the same careful planning and implementation as for any long-term development activity, namely:

- a careful risk assessment in advance to learn where the biggest gains can be made in biosecurity with the least effort;
- an assessment of the potential environmental and social impact of any restructuring proposal;
- a consultative process;
- gradual steps, to maximize buy-in and minimize livelihoods damage;
- investment of public money in basic infrastructure, training and quality monitoring; and
- impact monitoring once the plan has been initiated.

International coordination

FAO and OIE have taken a lead role in coordinating the international response to HPAI control at the animal source.

GF-TADs

A key mechanism for coordination between FAO and OIE (and WHO for zoonotic diseases) has been the establishment of GF-TADs in 2004. It combines the strengths of both organizations to achieve the prevention and control of HPAI and other TADs worldwide, and in particular to address their regional and global dimensions.

In 2005-2006, FAO-OIE Regional Animal Health Centres were set up in Asia, the Middle East and Africa to serve as regional support units of GF-TADs. These centres have been instrumental in the prevention and control of the disease through harmonized practises at the regional level, while ensuring effective implementation of the FAO Programme at country level.

In 2006, FAO and OIE further reinforced their collaboration with the establishment of GLEWS, OFFLU and CMC-AH tools operating within the GF-TADs framework. They respectively ensure disease tracking and intelligence, exchange and tracing of virus strains, and rapid response for technical and operational assistance to countries in relation to TADs in general, and HPAI in particular.

UNSC

UNSC was set-up in 2005 to help make the UN System work to its best effect in support of national, regional and global efforts to address the threats posed by avian and human influenza.

Global Strategy

In consultation with WHO, FAO and OIE have developed the Global Strategy for Prevention and Control of H5N1 HPAI. The strategy is regularly updated based on the evolution of the disease’s epidemiological situation. Many technical guidelines, best practices and recommendations for the control of HPAI have also been produced jointly, notably on the good governance of veterinary services, compensation and vaccination issues, the role of wild birds, and more recently on biosecurity measures in the poultry sector.

Global Programme

In line with the Global Strategy, FAO formulated a Global Programme to address the needs for the control of HPAI over a projected period of three years (2006-2008). The goals of the Programme are: to coordinate and manage, in collaboration with OIE, the international efforts in assisting countries to control and ultimately eradicate AI in the poultry-producing sectors; and to prepare non-infected countries to rapidly detect and respond to incursions of the disease.

OWOH five-year Global Programme

FAO is currently developing an OOH five-year Global Programme which is a continuation of the HPAI Global Programme, while also addressing other animal diseases in line with the OOH approach.

Interagency collaboration

FAO works in close collaboration with international donor institutions, such as the World Bank, the Asian Development Bank and the European Union, as well as with bilateral donors and regional organizations. This interagency collaboration facilitates information exchange within the international community, avoids unnecessary overlap and ensures that all partners are providing complementary support to a unified approach.

The Alive INAP initiative – jointly implemented by FAO, OIE, WHO and AU-BAR and funded by the European Commission – is an example of interagency collaboration which has contributed to HPAI preparedness in African countries in an integrated and coordinated manner, under the leadership of FAO.
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<tr>
<th>Abbreviation</th>
<th>Full Form</th>
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<tbody>
<tr>
<td>AHI</td>
<td>Avian and Human Influenza</td>
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<td>AI</td>
<td>Avian Influenza</td>
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<tr>
<td>ALive</td>
<td>Partnership for Africa Livestock Development</td>
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<td>ARI</td>
<td>Advanced research institution</td>
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<tr>
<td>AU-IBAR</td>
<td>African Union – Interafican Bureau for Animal Resources</td>
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<tr>
<td>CMC-AH</td>
<td>Crisis Management Centre – Animal Health</td>
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<td>CMS</td>
<td>Convention on Migratory Species</td>
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<td>CVO</td>
<td>Chief Veterinary Officer</td>
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<td>ECTAD</td>
<td>Emergency Centre for Transboundary Animal Disease Operations</td>
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<td>EID</td>
<td>Emerging infectious diseases</td>
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<td>EMPRES</td>
<td>Emergency Prevention System for Transboundary Animal and Plant Pests and Diseases</td>
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<td>FAO</td>
<td>Food and Agriculture Organization of the United Nations</td>
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<tr>
<td>GF-TADs</td>
<td>Global Framework for the Progressive Control of Transboundary Animal Diseases</td>
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<td>GLEWS</td>
<td>Global Early Warning and Response System for Transboundary Animal Diseases</td>
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<td>HPAI</td>
<td>Highly Pathogenic Avian Influenza</td>
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<td>INAP</td>
<td>Integrated National Action Plan</td>
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<tr>
<td>OFFLU</td>
<td>Network of Reference Laboratories, Epidemiology Centres and Groups of Experts on Animal Influenza</td>
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<td>OIE</td>
<td>World Organisation for Animal Health</td>
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<td>OPEC</td>
<td>Organization of the Petroleum Exporting Countries</td>
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<td>OWOH</td>
<td>One World, One Health</td>
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<td>RVF</td>
<td>Rift Valley fever</td>
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<td>SFERA</td>
<td>Special Fund for Emergency and Rehabilitation Activities</td>
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<td>TAD</td>
<td>Transboundary animal disease</td>
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<td>UN</td>
<td>United Nations</td>
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<td>UNDP</td>
<td>United Nations Development Programme</td>
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<td>UNEP</td>
<td>United Nations Environment Programme</td>
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<td>UNICEF</td>
<td>United Nations Children's Fund</td>
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<td>UNSIC</td>
<td>United Nations System Influenza Coordination</td>
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<td>WHO</td>
<td>World Health Organization</td>
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**ECTAD: FAO's response to animal disease emergencies**

The **Emergency Centre for Transboundary Animal Disease Operations** (ECTAD) is the Food and Agriculture Organization of the United Nations (FAO) corporate centre for responding to the threat of transboundary animal health crises through the planning and delivery of veterinary assistance to FAO Member Countries.

**ECTAD** was set up in 2004 to complement the Emergency Prevention System for Transboundary Animal and Plant Pests and Diseases (EMPRES) and strengthen FAO's capacity to respond to the Highly Pathogenic Avian Influenza (HPAI) crisis in a coordinated manner. In line with the One World, One Health framework, the scope of ECTAD now goes well beyond HPAI to include all major transboundary animal diseases and evolving disease situations with probable consequences for animal and human health.

**ECTAD**, a combined effort of FAO's Animal Production and Health Division and Emergency Operations and Rehabilitation Division, unites FAO's wealth of technical expertise and operational capacity within a holistic approach to animal health.