Recommendations from the FAO & OIE International Scientific Conference on Avian Influenza and Wild Birds (Rome, Italy 30-31 May 2006)

Background

The outbreaks of highly pathogenic avian influenza (HPAI) H5N1 between 2003-2006 have had considerable impacts on people's livelihoods, international commerce of poultry and poultry products, and have killed an unprecedented number of wild birds ranging from Barheaded Geese in Asia to Mute Swans in Europe. Though poultry production and commerce have played the largest role in the spread of the disease, wild birds have also contributed to the introduction of the H5N1 virus to new geographic locations.

Information on migratory water bird species, population sizes, their precise migration routes and flyways, important congregation and mixing sites of water birds, and the main areas of interaction with more sedentary, locally migrant and peri-domestic birds are a prerequisite for understanding the potential role that wild birds may play in the spread of HPAI H5N1. This information is also crucial to implement scientifically developed risk assessments, surveillance programs, and early warning systems.

Considering that: (a) the rapid spread of HPAI H5N1 in wild birds has had a considerable impact on the public's perception and attitudes towards wild birds, their conservation, and management and (b) there is an overall poor understanding of the epidemiological role of wild birds in the occurrence of HPAI H5N1 outbreaks affecting wildlife, poultry and human health in Asia, Middle East, Europe, and parts of Africa, there is an urgent need for the global community to collaborate to develop more knowledge in this area.

Several presentations at the Conference, some supported by recent publications in peer-reviewed scientific journals, implicated wild birds in the introduction of HPAI H5N1 virus at considerable geographical distance from known H5N1 outbreaks in poultry, as well as demonstrating changes in virulence characteristics in certain wild bird species.

Much of the known AI virus ecology in wildlife is based on knowledge of low pathogenic avian influenza strains (LPAI) and has been extrapolated to H5N1. This body of information is valuable, but cannot explain all facets of H5N1 epidemiology or ecology in wild avian species, as it is becoming clear that HPAI H5N1 is distinctly different than previously studied LPAI strains. In the current crisis (2003 to-date), the H5N1 HPAI virus has affected many wild bird species, resulted in apparently high wildlife mortality rates, and expanded rapidly over a large geographical territory in a short time frame prompting national and international agencies to re-think past strategies, promote research for novel tools, and re-design appropriate response strategies for the poultry, wildlife and human health sectors.

In poultry, virus propagation and dissemination is promoted by poor levels of biosecurity at farms (commercial facilities, open poultry or duck farms, and back-yard flocks) and processing plants. As well, high concentrations of poultry farms in small geographic areas and poultry trade traffic help facilitate the spread and movement of this pathogen. Concrete options are available to mitigate the risk of spread of virus in poultry, and these have been developed by the FAO and the OIE[1]. In Africa, evidence to date indicates that H5N1 virus introduction and spread was poultry related and chiefly based on human production and

commercial factors, but further research is needed to fully understand other possible routes of virus introduction, including those posed by bird migration.

H5N1 disease management must be based on improved biosecurity and hygiene at the commercial poultry production level, and in all other poultry sectors. This includes measures to prevent the spread among poultry and farms, as well as taking measures to minimize or prevent contact between domestic and wild birds. Destruction of wild bird populations or their habitats to eliminate roosting or nesting sites in an effort to control, manage, or prevent possible introduction of H5N1 (or future AI viruses or other diseases) from wildlife to the agriculture sector is neither scientifically sound nor justified from the standpoint of effectively preventing disease introduction. Furthermore, these activities would contribute to environmental degradation and reduce biodiversity making these decisions inappropriate for many additional reasons. This is consistent with previous FAO recommendations and reinforced by recent resolutions of the Ramsar Convention, Convention on Migratory Species and African-Eurasian Waterbird Agreement[2]. Instead, efforts must be placed on a rapid response to poultry outbreaks, decreasing the viral load of infected poultry, preventing healthy flocks from being exposed to the disease, and preventing wild birds from being exposed to potentially infected poultry.

Tackling the disease at source (in this case – known infected or potentially virus-incubating poultry) is a strategy voiced by the FAO and the OIE, and supported by the WHO. This approach needs to be promoted and advocated in order to not elevate unjust government or producer responses that involve elimination of wild birds or environmental destruction.

The FAO/OIE International Scientific Conference on Avian Influenza and Wild Birds builds on a growing body of knowledge, recommendations, and resolutions from other international meetings including, but not limited to: 1) FAO/OIE Regional Meeting on Avian Influenza in Asia (Bangkok, Thailand, February 2004); 2) OIE/FAO Scientific Conference on Avian Influenza (Paris, France, April 2005); 3) UNEP/CMS 9th Conference of the Parties and Roundtable on Avian Influenza, Nairobi, Kenya, November 2005; 4) UNEP/CMS/AEWA Scientific Seminar on Avian Influenza, the Environment and Migratory Birds (Nairobi, Kenya, April 2006); 5) 6th International Influenza Meeting, (Cambridge, UK, April 2006); and 6) Convention on Biodiversity - Brainstorming on Avian Influenza and Biodiversity (Curitiba, Brazil, March 2006).

This Conference has contributed to our understanding of avian influenza and important aspects of disease introduction, transmission, and spread, environmental persistence, and the role that poultry production and commerce, wildlife trade (both legal and illegal), and migratory birds play in the ecology of the disease. The Conference concluded that there are numerous questions that currently remain unresolved, and that a multidisciplinary and cross-sectoral approach is required in order to address these complex issues. This approach should include (but not be limited to) veterinarians, wildlife ecologists, ornithologists, wildlife health specialists, virologists, epidemiologists, risk analysts, modelling experts, social scientists, economists, public health professionals, physicians, and staff or personnel from veterinary services, conservation organizations, government resource agencies and ministries (Natural Resources, Agriculture, or Environment), university research institutions, and non-government organisations.

Considering the outcomes from these meetings, The FAO and OIE International Scientific Conference on Avian Influenza and Wild Birds ***resolves that*:**

1. There is an urgent need for long-term investment in population monitoring and in undertaking research that improves the understanding of wild bird (both migratory and resident species) behaviour, precise migratory routes and phenology associated with these movements, locations of aggregation and convergence and interactions between wild birds and domestic species;

2. More targeted wildlife surveillance is necessary to determine which avian influenza viruses may be endemic or carried by potential migratory hosts;

3. Further information is needed to determine the global extent of captive wild bird trade;

4. Improved regulatory measures are necessary for prevention of disease transmission and improved species conservation efforts;

5. Consideration of the socio-economic status and cultural traditions or practices of stakeholders is required to determine effective and acceptable disease (HPAI H5N1) control measures. These considerations include but are not limited to costs and benefits of programs, compensation schemes, livelihoods, rehabilitation, and restructuring options;

6. Political and trade considerations must not override humanitarian needs or the conservation of national and regional biodiversity including wild bird species, in accordance with international agreements;

7. A multidisciplinary and cross-sectoral approach is required to circumvent further spread of the HPAI H5N1 virus and to improve national implementation strategies at the animal source – poultry;

8. Destruction of wild bird habitats or indiscriminate culling of wildlife is scientifically unjustified as a method to prevent disease transmission, as a response to an HPAI H5N1 outbreak, or as a control strategy;

9. There is a need for a long-term investment to better understand interactions between wildlife, livestock, and humans;

10. Data collected on disease outbreaks, spread, and transmission, as well as surveillance and ecology data, should be coordinated by a central body and be openly shared and easily accessible.

Recommends that:

[General]

1. Disease early warning programs for monitoring the HPAI H5N1 virus (and other diseases) in wild birds should be developed and should include both an active sampling component (targeted sampling of free ranging healthy wild birds and sampling of sick or dead birds from mortality events) and a passive sampling component (samples that can be obtained opportunistically). Sampling both live and dead birds is vital for establishing a comprehensive surveillance system and is essential for early detection of the HPAI H5N1 and for implementing proper measures to prevent disease transmission from wildlife to poultry;

2. The official veterinary services, with the assistance of environmental officials, ornithologists, ecologists, wildlife health experts, hunters, farmers and commercial operators and their associated organizations should be responsible for collating and reporting the information collected as part of this disease early warning program in a transparent and timely manner;

3. The approach for disease surveillance in wildlife should take into consideration, whether sampling is to be focused on testing for one specific disease (HPAI H5N1), multiple avian influenza sub-types (H5 and H7 AI's), or various diseases that affect birds. In as many situations as possible, it would be beneficial to collect samples to establish baseline information on H5N1, other avian influenza sub-types, and additional avian diseases. Collecting environmental data (wild bird species present, type of habitat, proximity to poultry farm activities) as well as environmental samples (waters, soil, etc.) may also be important for understanding the ecology of this disease;

4. Strengthening veterinary services (central and local) is required to establish a disease early warning program, to improve disease reporting, and for the implementation of counter-epizootic measures. Integrating the knowledge and capacities of ancillary disciplines such as epidemiologists, wildlife specialists, virologists, ecologists, ornithologists, molecular biologists, sociologists, economists, communication specialists, public health practitioners, subsistence hunters, and institutions/organizations such as agricultural producers, private industry, conservation organizations, and recreational hunting clubs is an essential step in creating a more robust veterinary services program;

5. As a transboundary animal disease, HPAI H5N1 could benefit from the experiences and accomplishments of the Global Rinderpest Eradication Programme in regard to country cluster cooperative direction, use of existing specialised organisations, and establishment of regional networks;

6. Funding is critically required from international agencies, donors and partner institutions to develop coordinated long-term monitoring schemes, policies, and appropriate intervention measures;

7. Coordination as well as integration of diverse information ranging from satellite imagery to geospatial and temporal data to viral genetic sequences is necessary to

provide a better understanding of the global movement of this disease, H5N1 AI. Better cooperation across disciplines is necessary but this will ultimately lead to a better understanding of disease emergence, methods of disease containment, and ultimately, improve disease modelling and outbreak prediction.

8. There are advantages and opportunities in encouraging public and private partnerships in responding to and preventing future outbreaks of HPAI and other emerging infectious diseases.

[Specific]

Early Warning and Surveillance

EWS 1. Targeted active and opportunistic passive sampling of wild birds be should be conducted as part of a surveillance program to determine whether HPAI H5N1 is endemic in wild bird populations;

EWS 2. Improved monitoring of wildlife is necessary with an emphasis on detecting mortality events and deploying trained staff to conduct a proper disease outbreak investigation including proper incident description, sample collection, and collection of additional environmental information. Mortality events in wild birds provide an important opportunity to collect extremely valuable samples as part of a disease early warning program;

EWS 3. Precise information about wild bird migration routes and behaviour coupled with associated risk for disease spread, introduction into poultry farms or spill-back from poultry into wildlife needs to be generated. It is important that these efforts are well coordinated, they utilize the expertise of people across a wide range of professions, they have the support of local and national authorities, and that this not a short-term focus;

EWS 4. Establishment of a global wild bird tracking and monitoring facility, based on timely coordinated networks, and building on existing work involving all relevant institutions across the world, including scientific centers, farmer organisations, hunters, bird watchers, wetland, wildlife conservation societies, and others.

Epidemiology

EPI 1. Studies of genetic and phenotypic evolution of AI viruses in wild birds and their comparisons with poultry isolates be conducted;

EPI 2. Coordination of research results across scientific disciplines, covering ornithology, virology, ecology, epidemiology (including molecular epidemiology), satellite imagery, telemetry, and geospatial and temporal data processing be undertaken to promote global tracking of potential hosts and disease causing agents;

EPI 3. Studies focused on identifying potential disease transmission risk factors for wild birds, for poultry, from wild birds to poultry, from poultry to wild birds, from poultry to humans, and potentially from wild birds to humans (although this mode of transmission has rarely been documented) be conducted. Some factors identified as important include

where wild birds seasonally aggregate, the proximity of wild bird habitats and poultry farming (chicken, duck, goose, other), locations of potential breaks in poultry biosecurity;

Research

RES 1. An integrated, openly accessible databases be established to serve as a place where wild bird and poultry surveillance results, wild bird migration and movement information, and ecological information on weather and other environmental factors (frost, precipitation, temperature, daylight hours, etc.) that may play a role in disease emergence, transmission, and movement patterns can be integrated and evaluated. This is of important because general knowledge on AI, disease early warning system(s), and information necessary to perform risk assessments, could all be centrally located in one place. Such an endeavour would require an institutional focal point of information;

RES 2. Satellite and VHF telemetry technology be incorporated into ornithological and epidemiological research to improve the understanding of the timing and routes of wild bird migrations in relation to the emergence patterns and detection of AI in both poultry and wildlife;

RES 3. Financial support be provided to use of these technologies in the study of AI emergence, and that additional funding be made available for monitoring wild birds and understanding wild bird population distributions through out the year;

RES 4. Controlled laboratory studies are conducted in selected species of wild birds to determine AI vaccine efficacy, required antigen content[3], and safety;

RES 5. Controlled infectivity studies be conducted in key wildlife species that include aspects of susceptibility, incubation period, viral shedding, immune system response (and duration), pathology, and viral persistence;

RES 6. Emergency outbreak response activities or other field investigations incorporate collection and proper storage of environmental samples (water, sediment, etc.) for analysis during episodes of disease/infection occurrence and intervening periods (winter maintenance);

RES 7. Methods be developed, validated and standardised for the collection and analysis of environmental samples (waters, soils, fomites, air) for the detection of avian influenza viruses or other pathogens and contaminants.

RES 8. Improvements in diagnostic tools are developed for the rapid and reliable detection of H5, H7, and H9 AI antigens.

Operational

OP 1. Veterinary services be strengthened by encouraging new working relationships with individuals and organizations that have additional expertise of relevance to AI, wildlife ecology, and disease transmission among wildlife and agriculture. Developing a network of experts that can work with veterinary services will improve early disease detection capabilities, lead to seamless interaction with institutions in the wildlife and

environmental sectors, assist with timely disease outbreak investigations, facilitate sample collection and submission, and improve obligatory reporting associated with disease monitoring and surveillance activities;

OP 2. Field investigations should include trained ornithologists and wildlife specialists that can interface with veterinary and public health authorities.

OP 3. Results of field and laboratory studies should be reported to the international community (veterinary, wildlife, agriculture, and human) in a timely and urgent manner with due recognition to the originators of studies, national scientists, and facilitators or funders of such efforts;

OP 4. Training and quality control/assurance be promoted to ensure that AI virus samples are properly collected, stored, shipped and that the methodologies used are appropriate for surveillance, proficient diagnosis, and comparable to other FAO-OIE laboratory results. Specifically, cloacal and upper respiratory (tracheal) samples should be collected on all disease outbreak investigations and during wildlife surveillance activities. Duplicate samples should be collected and archived for subsequent investigations;

OP 5. Resources be made available to develop internationally validated serological assays for wildlife recognising that current serological assays for AI viruses in numerous wildlife species are inconsistent and false negative results endanger interpretation. However, inclusion of historically analyzed positive serological test results should be part of a larger AI data resource;

OP 6. Efforts should be undertaken to assure the harmonisation of molecular-based tools for AI virus diagnostics from both a technical and interpretative standpoint.

OP 7. Multidisciplinary approaches be taken to communication of risks, risk assessment, mitigation of occupational hazards, and overall capacity building in risk analysis methodologies.

Contingency Planning and Disease Management

CDM 1. Appropriate contingency and communication planning takes place in countries and regions to undertake wild bird surveillance for HPAI H5N1 and other diseases. These activities should be based on scientific understanding and can take place in advance of poultry outbreaks, or concurrent with reliable test-positive poultry cases. Surveillance activities should be undertaken in species which are most likely the hosts of the disease, and species that pose the greatest transmission risk due to behaviour and movements.

CDM 2. Destruction of the environment, elimination of wild birds and wild bird habitat is unsound in regional, national, or international plans and must be opposed by decision makers[2].

CDM 3. Comprehensive compensatory schemes in national contingency and disease management plans be developed as they are essential for early reporting and should offset producer's losses and preservation of livelihoods. In addition, such appropriate incentives to encourage rapid reporting of outbreaks in poultry would serve to decrease

environmental viral loads, and thus decrease chances for spill back of new introductions into wild birds.

CDM 4. Guidelines and contingency plans be developed for appropriate response and control strategies to H5N1 outbreaks in wild birds. This information should be widely communicated, particularly in developing countries with limited resources.

Rome, 5 July, 2006

Endnotes:

[1] FAO/OIE Global Strategy for the Progressive Control of HPAI (http://www.fao.org/ag/againfo/subjects/documents/ai/HPAIGlobalStrategy31Oct05.pdf)

[2] Resolutions that specifically relate to conservation of wild birds and their habitats in response to HPAI: AEWA MoP3: Resolution 3.18. Avian Influenza. Dakar, Senegal, Ramsar CoP9: Resolution IX.23. Highly pathogenic avian influenza and its consequences for wetland and waterbird conservation and wise use. Kampala, Uganda, and CMS CoP8: Resolution 8.27. Migratory species and highly pathogenic avian influenza. Nairobi, Kenya.

[3] Reference is made to antigen quantities required in inactivated/adjuvant vaccines and their standardization. It is acknowledged that gene-expressed specific antigens would require additional methods for their standardization and regulatory approval.