Avian influenza (AI) presented a crisis unprecedented in scope, geographical distribution and severity. This disease has been and is still responsible for disastrous economic losses, especially in Southeast Asia, resulting in millions of people living in poverty. This disease is capable not only of spreading to other continents, but it has a potential to lead to a human pandemic. This explains the close collaboration established by OIE/FAO with the WHO, our main objective being to prevent any pandemic from occurring by eliminating the virus at its animal source.

The OIE and FAO have already organized, with the support of WHO, two regional conferences in Southeast Asia to coordinate control efforts in the region. In addition to the organization of scientific meetings, these two organizations have provided significant technical expertise to countries of the region in terms of capacity building for better surveillance, diagnosis and control of AI. Following these two regional meetings, the OIE and FAO have thought it wise and considered it timely that an international scientific conference be held at the OIE, whose main mission is the international prevention and control of animal diseases and zoonoses. The main objective of the conference was to review the latest scientific knowledge and to address the different aspects of the control of the disease based on this new knowledge.

Over 250 experts from 59 countries, representatives of Veterinary Services and of various international organizations, participated in the Conference. 38 internationally recognized experts presented lectures on the experience gained in the recent past in the field of epidemiology, pathogenesis, molecular diagnosis and control and eradication strategies. The Conference also provided an opportunity to further evaluate and improve the current standards and guidelines being proposed by the OIE for the better worldwide control of Avian Influenza. The participants also had the opportunity to discuss 42 poster presentations exhibited during the Conference.

An important outcome of the Conference was the launching of the OIE/FAO network on AI expertise, aiming at promoting research on Avian Influenza and to provide assistance, especially to developing countries, in the diagnosis and management of the disease. The Network Steering Committee will be chaired by the President of the OIE Biological Standards Commission. The Secretariat of the Network is based in the OIE Reference Laboratory for AI in Padova, Italy. Another major objective is to set up with WHO
a new mechanism allowing the management of the animal-human interface through the OIE/FAO and the WHO networks. This network will provide the WHO with virus isolates from animals which could be used to rapidly produce human vaccines in the wake of a potential pandemic.

The Conference concluded the following recommendations referring to the different fields of ecology and epidemiology, pathogenesis, human health implications, diagnostic, control of AI with focus on vaccination, and on the improvement of management tools.

Recommendations

Conference attendees of the OIE/FAO International Scientific Conference on Avian Influenza recommend the following:

**Session 1: Ecology and Epidemiology**

1. To prevent the spread of AI viruses to unaffected areas/countries.
2. Country/regional specific studies should be conducted to establish the ecology and epidemiology of the AI virus in reservoir and spill-over species of poultry for the purpose of developing control programmes to stop virus cycling and re-infection.
3. Surveillance and epidemiological studies in migratory and resident wild birds should be conducted to assess the role of wild birds in the maintenance and dissemination of HPAI viruses.
4. Develop sustainable risk-based surveillance programmes for poultry for early identification of AI virus transfer from reservoir species to agricultural systems in order to know if and which AI viruses are present in poultry and develop rapid mitigation and elimination strategies, if required.
5. Encourage national laboratories to join multi-national and international laboratory networks to share AI virus isolates, data and expertise in order to understand AI virus ecology and develop effective control strategies.
6. Support pathogenesis studies in alternatively farmed birds (e.g. ostriches, waterfowl, pheasants, etc.), including an assessment of their role as intermediate hosts for transfer of AI viruses from wild birds to traditionally farmed poultry species, and their potential role for supporting mutation of H5 and H7 LPAI to HPAI viruses.

**Session 2: Pathogenesis**

1. Country authorities should be made aware of different clinical syndromes in different hosts caused by infection by AI viruses as typical disease signs have been seen in infections with recent isolates.
2. Specific genes from virus isolates should be monitored for evidence of reassortments and drift that may contribute to changes in virulence.
3. Surveillance of birds for the presence of H9N2 viruses with the potential to infect mammals should be done.
4. Consideration should be given to conduct monitoring of pigs at risk from infections with AI viruses with the potential to transmit to humans.
5. Investigate the pathogenesis and epidemiology of avian influenza viruses in different species of birds and mammals under the coordination of the joint OIE/FAO network with the support of the OIE/FAO Reference Laboratories for AI.
6. Specific research be conducted on AI surveillance and vaccination in farmed ducks.

**Session 3: Human health implications**

1. Further epidemiological studies at the human-animal interface as well as applied and basic research on H5N1 and other AI viruses with potential human health implication should be conducted urgently and by collaboration between the animal OIE/FAO network and the human WHO network.
2. Coordinated research programs must involve veterinary, public health and industry sectors. Safe and efficacious human and avian vaccines should be developed as a priority.

3. Veterinary and Public health services should work together to improve national, regional and global health security. Public health services should support the agriculture sector/veterinary services in order to control and eliminate the disease at source and to protect farmers and workers from animal infection in the most efficient and efficacious manner.

4. Veterinary and Public health services should strengthen joint activities for surveillance of AI at the human/animal interface. Animal virus isolates and sequence information should be swiftly exchanged between the international reference laboratories of OIE-FAO and those of WHO.

5. FAO, OIE and WHO should collaborate with their Member Countries in the development of appropriate strategies for effective intersectoral collaboration during and between crises associated with emergence of zoonoses.

Session 4: Diagnostics

1. OIE/FAO assist countries in enhancing their veterinary infrastructures to meet the current and future needs for early detection, surveillance and control programmes for avian influenza.

2. OIE/FAO encourage countries/regions to develop a laboratory network that would facilitate the local testing of specimens to decrease turn-around time for diagnostic test results while increasing overall testing capacity. This network should be coordinated through the newly established OIE/FAO network (OFFLU) that could recommend appropriate testing methods, provide training to laboratory personnel, supply quality reagents, and collaborate with OIE/FAO Reference Laboratories.

3. OIE/FAO encourage development of training programmes for laboratory personnel to ensure that appropriate diagnostic tests are used, that test results are interpreted correctly, and that appropriate quality assurance programmes are being used.

4. OIE/FAO encourage development of rapid, sensitive, and cost-effective diagnostic tests that have been properly field validated according to OIE guidelines and appropriate for use in local laboratories involved in the diagnosis of avian influenza.

5. OIE/FAO develop a prototype Material Transfer Agreement (MTA) that could be used by laboratories to facilitate the transfer of viruses to reference laboratories for epidemiologic/research purposes.

Session 5: Control of AI (with focus on vaccination)

1. Infections with HPAI viruses be controlled at source, through implementation of risk reduction interventions, including improved biosecurity, stamping out, vaccination, and education awareness programmes.

2. Donors should give priority to reinforce Veterinary Services and animal health infrastructures in countries infected or threatened by AI.

3. Vaccination should only be used in conjunction with monitoring of vaccinated flocks to ensure efficacy, proper use of the vaccine and absence of virus circulation.

4. Vaccines should comply with OIE standards and vaccination strategies should be consistent with guidelines developed by FAO, and of proven efficacy under experimental and local field conditions.

5. Vaccine delivery systems and vaccination campaigns should be carefully organised and monitored by Veterinary Services.

6. That, wherever appropriate, a surveillance system capable of
differentiating infected from vaccinated birds (e.g. DIVA) be applied (including use of sentinel birds when possible).

7. That surveillance programmes be defined before vaccination is introduced. Likewise, an exit strategy has to be identified.

8. That strategies be developed and evaluated in statistically based field trials for the appropriate use of vaccination in different epidemiological scenarios which may occur worldwide.

**Session 6: Improvement of Management Tools**

1. A master plan be prepared for the control and prevention of HPAI in Asia and in other threatened regions, with regional and international coordination;

2. Adequate financial resources be invested to the control of AI in Asia, which is currently estimated between 100 and 120 million USD over a 3–5 year period

3. The meeting strongly recommends that OIE and FAO implement activities of the joint global OIE/FAO network of expertise for avian influenza as soon as possible.

4. The existing FAO regional networks for surveillance and diagnosis be sustained in the long term run.

5. The FAO/OIE Global Framework for the Progressive Control of Transboundary Animal Diseases (GF-TADs) initiatives be used as a foundation for the regional approach to the control and eradication of AI. The mandates and missions of international and regional organizations be harmonized to avoid gaps and overlapping.

6. Strategies are needed for financing sustainable, concrete action at local level. This is likely to include support for restocking or compensation for losses and should also encompass education on safe poultry keeping and development of appropriate infrastructure and services.

7. National and regional strategies for AI prevention and control should include a careful assessment of the social and economic impact of proposed measures, including the impact on the wider rural economy of changes in the poultry sector. Options for long-term strategies for restructuring of the sectors be previously considered and the possible negative socio-economic impacts on small and medium holders be evaluated as well as the options and cost for mitigation strategies.

8. That, when a decision is made to kill infected or at-risk birds, birds should be humanely destroyed and disposed of along with dead poultry in line with OIE standards. In the case of HP infections, the birds should not be allowed to enter the human food chain or be fed directly or indirectly to other animals including zoo animals.

9. That the OIE International Committee adopts the proposed new surveillance guidelines on AI during the 73rd General Session.

10. That the efficacy of risk reduction and prevention procedures be monitored through targeted surveillance activities, including:
- post-vaccination surveillance to measure efficacy of vaccination,
- early identification of virus circulation,
- monitoring of genetic drift and emergence of new strains
- monitoring of reservoirs.

11. That the concept of compartmentalisation be recognised as an additional tool in the control of AI and in the facilitation of safe international trade, subject to the effective implementation of the relevant control measures.

12. That the OIE International Committee adopt the proposed revised Terrestrial Code chapter on AI that incorporates the concept of compartmentalisation and that provides
13. That the OIE and FAO continue to provide practical advice to Member Countries on the establishment and monitoring of compartments, through additional guidelines.

14. That OIE Member Countries use the new Terrestrial Code chapter and the surveillance appendix as a guide for their national activities and as standards for international trade.

15. That the FAO, World Bank and other multilateral and bilateral donors should continue to provide assistance to further strengthen countries’ compliance with international standards, including on quality of Veterinary Services.

16. That the OIE develop guidelines for AI virus inactivation in processed products.

17. That strategies be developed for financing sustainable, concrete action at local level, to include support for restocking or compensation for losses, to encompass education on safe poultry keeping and the development of appropriate infrastructure and services.

18. That the OIE designate prescribed tests for international trade where testing is required by the Terrestrial Code.

19. That OIE/FAO Reference Laboratories collaborate to exchange virus isolates and develop internationally agreed standards for diagnostic testing. The exchange of virus isolates and other information such as sequence data between the OIE/FAO network and the WHO laboratory network is urged.

20. Decision making in animal disease control and prevention be based on scientific evidence arising from valid epidemiological data analysis generated from reliable information systems. All efforts should be made to develop such systems even in developing countries.

(Adopted by the OIE/FAO International Scientific Conference on Avian Influenza Paris (France), 7-8 April 2005)

Full text of the Conference conclusions and 56 recommendations can be downloaded from the OIE website www.oie.int. The Conference proceedings will soon be edited by the OIE and the International Association for Biologicals (IABs).

risk-based recommendations for trade in live poultry, genetic material and products for human consumption. It also encourages transparency in disease reporting, by limiting trade consequences to situations of significant risk.

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