



**Food and Agriculture Organization
of the United Nations**



World Organisation for Animal Health



World Health Organization

**FAO/OIE/WHO CONSULTATION ON AVIAN INFLUENZA AND HUMAN HEALTH:
RISK REDUCTION MEASURES IN PRODUCING, MARKETING, AND LIVING WITH
ANIMALS IN ASIA**

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UNPRECEDENTED WIDESPREAD OUTBREAKS OF AVIAN INFLUENZA

1. The unprecedented widespread outbreaks of avian influenza in many countries in Asia, and the demonstrated capacity of the avian influenza H5N1 strain to directly infect humans and cause death, have together significantly increased the risk of the emergence of a human influenza pandemic.
2. To date there have been 108 cases of infected humans reported across three countries with 54 deaths, the majority of who were people who had been closely associated with sector 4¹ farms, i.e. backyard or scavenging chicken farming. However, the virus has yet to develop efficient human-to-human transmission. Thus, there is still the opportunity to take action that focuses on reducing the

1 **Sector 1:** Industrial integrated system with high level biosecurity and birds/products marketed commercially (e.g. farms that are part of an integrated broiler production enterprise with clearly defined and implemented standard operating procedures for biosecurity).

Sector 2: Commercial poultry production system with moderate to high biosecurity and birds/products usually marketed commercially (e.g. farms with birds kept indoors continuously; strictly preventing contact with other poultry or wildlife).

Sector 3: Commercial poultry production system with low to minimal biosecurity and birds/products usually entering live bird markets (e.g. a caged layer farm with birds in open sheds; a farm with poultry spending time outside the shed; a farm producing chickens and waterfowl).

Sector 4: Village or backyard production with minimal biosecurity and birds/products consumed locally.

risk of the virus establishing the attributes and prevalence necessary for a pandemic.

3. With this in mind, there is an urgent need to address the root cause of the situation - the way in which humans interact with and handle the production (especially backyard farming production), distribution, processing and marketing of animals for food.

CURRENT PRACTICES EMPLOYED IN THE PRODUCTION AND MARKETING OF LIVE ANIMALS IN ASIA WHICH CAN HAVE POTENTIAL HUMAN HEALTH IMPLICATIONS

4. The urgency for action by International and Regional Organizations; national and local authorities; and the farming and marketing community itself is required by the diversity of high risk practices associated with the production and marketing of animals for food, the way in which humans live with animals in Asia and the way in which animals are prepared for food.
5. In farming of poultry, high risk production practices include the farming of multiple species of animals, including poultry and waterfowl, within one farm unit; the keeping of chickens over fish ponds; the use of untreated chicken faeces as fertilizer or livestock feed; the inappropriate disposal of dying and dead birds; the use of surrogate birds to incubate eggs of different species; and the lack of adoption of 'all-in, all-out' husbandry systems.
6. The Consultation also recognised the role that live animal/wet markets have played in the emergence of avian influenza. In 1992, live poultry markets in the USA were considered the "missing link in the epidemiology of influenza". They were identified as the source of the H5N1 infection in chicken farms in Hong Kong in 1997 when approximately 20% of the chickens in live poultry markets were found to be infected. The same situation was seen in Viet Nam, where the circulation of H5N1 in geese in live bird markets in Hanoi had been documented three years before the 2004 outbreaks in chicken farms.
7. In this regard, it was noted that a number of high-risk practices are commonly employed in the wet markets² of Asia. These include an apparent Regional preference for 'warm' meat which in itself is a contributing factor leading to the persistence of live bird markets in Asia; the limited application of good hygiene, cleaning and disinfection; the keeping of multiple species together and in confined spaces; the stacking of cages on top of one another; poor ventilation; the lack of pre-marketing health checks; a lack of training and education of stall owners; and a lack of personal protective equipment for stall owners. It is also considered a high-risk practice for birds that have been held for selling in markets (but which have not been sold) to be returned to the farms from which they came.

² In essence, a wet market is a place either fixed or temporary, where members of the public go to buy small animals and birds that are: (a) live and slaughtered there, (b) live and taken home to be slaughtered, or (c) already slaughtered and sold as meat.

8. In the general community, especially in communities associated with sector 4 (backyard) farms, birds commonly enter homes without restriction, children keep poultry as pets and in many cases prized birds (especially fighting cocks), and sometimes other birds are housed in the family home.

**A DIVERSITY OF REGULATIONS ARE CURRENTLY USED
TO CONTROL AVIAN INFLUENZA IN ASIA**

9. To address such high risk practices there is a need to develop, review, and strengthen the existing regulatory controls in Asia, as appropriate to the differing country situations. In so doing, it is essential to recognize that there is a diversity of production systems and regulatory environments across the Region.
10. Currently, the most comprehensive regulatory control has been implemented in the People's Republic of China's Special Administrative Region of Hong Kong (Hong Kong, China). In direct response to the avian influenza outbreak it had experienced in 1997, Hong Kong, China, has introduced an extensive range of regulatory measures on the production, importation and sale of live birds to Hong Kong, China. The measures that Hong Kong, China, put in place have included requiring vaccination of all Hong Kong farmed chicken and all chickens imported from mainland China (the main source of live poultry for Hong Kong, China); farm structural changes including installation of bird-proof facilities to prevent possible avian influenza transmission from wild and migratory birds; the use of sentinel chickens (i.e. unvaccinated chickens) that are to be placed in each batch of vaccinated chickens; the registration of all farms; requiring quarantine, inspection, sampling and testing as well as health certificates for each consignment of imported chickens; requiring that all birds are held in a single wholesale market before being sold by retailers; monitoring of the bird population for dead and sick birds and the surrender of any such birds for analysis; prohibiting the mixing of different types of poultry in order to reduce the interspecies transmission of avian viruses and to minimize the opportunity for reassortment of the viral genes; requiring that waterfowl are centrally slaughtered; ensuring that waterfowls are slaughtered in central facilities and the carcasses and offal of waterfowls are packed individually and separately respectively to prevent cross-contamination; prohibiting the sale of live quail in poultry retail outlets; introducing mandatory rest days when retailers must slaughter all remaining live poultry on the premises before designated hours of the days and suspend their business thereafter to allow thorough cleaning and disinfection of the premises; and inspecting compliance of rest day requirements and removing the tenancies/licences of those contravening the requirements.
11. Other countries have legislation addressing containment of avian influenza which can provide the framework for effectively containing outbreaks once they occur. Malaysia is noted to have a strong piece of legislation capable of providing authorities the capacity to effectively respond to animal disease outbreaks.

12. Viet Nam has also responded to the current avian influenza outbreak and other animal disease outbreaks by establishing a number of regulatory controls related to breeding, slaughtering, transporting and trading in animals for food. However, there remain a number of gaps between legislation and enforcement.
13. In some other countries of the region the focus is on early detection and stamping out of avian influenza, and legislation does not permit vaccination of birds in order to give greater emphasis to these strategies.
14. Finally, some countries have general regulations related to the registration and licensing of livestock, poultry and poultry by-products handlers and distributors. In Indonesia, Cambodia and Lao PDR such general legislation exists.

**SHORT TERM RISK REDUCTION MEASURES TO
PROTECT HUMAN HEALTH FROM AVIAN INFLUENZA**

15. If countries are to focus on situations where humans appear at greatest risk, priority must be given to sectors 3 and 4 farms and associated communities where humans live in very close proximity to the animals they or other community members are raising.
16. If there is existing active infection; the situation is one where sector 4 biosecurity cannot be improved; and there is significant challenge from Highly Pathogenic Avian Influenza (HPAI) viruses, including infection in neighbouring villages, wild birds, domestic ducks or bordering countries, veterinary authorities should consider vaccination strategies (as part of a multi-element response) to minimize propagation by this sector, to protect susceptible birds from infection and to manage human health risks.
17. In sector 4 production systems where the chickens are fully susceptible to infection with HPAI and there is a high risk of infection, it may be appropriate to vaccinate all chickens. In the case of outbreaks, stamping out remains the primary method to be used.
18. The use of vaccination must be coupled to surveillance in accordance with OIE guidelines to promptly detect any virus circulation or change in properties. Vaccination must also be carried out with appropriate products, manufactured and quality-controlled to ensure compliance with international standards referred to in the OIE Manual of Standards for Diagnostic Tests and Vaccines.
19. The 'differentiation of infected from vaccinated animal' (DIVA) approach is recommended either through the use of an appropriate diagnostic test or the use of sentinel birds. Furthermore, vaccination teams should be trained in biosecurity measures, in vaccination procedures and in public health measures, including the correct use of personal protective equipment (PPE).
20. The methods and tools to be used to prevent and control avian influenza have been fully described in the FAO document "FAO

Recommendations on the Prevention, Control and Eradication of HPAI in Asia", which was prepared in collaboration with OIE, in September 2004.

21. There is also an urgent need to know more about the virus and how it circulates. Thus one of the first areas for joint action for animal and human health authorities should be to enhance the intelligence available to international organizations by providing more human and animal viruses for sharing with animal and human laboratory networks. Efforts should also be made to share data from sero-prevalence studies, studies of infections transmitted among humans and studies of infections transmitted from animal to humans.
22. The Consultation recognized the importance of improving disease notification to health and veterinary authorities and recommends that incentives which include a combination of financial, competition (perception of doing better than others), and peer pressure, if appropriate, should be applied to increase the willingness of farmers in disease reporting.
23. Other regulatory controls that were seen as of importance in the short term for countries where avian influenza is reported were regulatory controls addressing: outbreak management, including the stamping out of defined infected flocks; the protection of farmers and workers; appropriate carcass disposal; cleaning and disinfection; movement control; surveillance in high risk populations; import control and quarantine; and registration and licensing of sectors 1 and 2 farms.

**SHORT TO MEDIUM TERM RISK REDUCTION MEASURES TO
PROTECT HUMAN HEALTH FROM AVIAN INFLUENZA**

24. Governments, industry associations, and farmers in sectors 1-3, all need to support and/or implement good farming practices, including enhanced biosecurity, at poultry farms and associated premises. The barriers between farms and their outside environments need to be more effectively managed, including closer control over the movement of the many people, animals and inanimate objects entering and leaving farms.
25. The exclusion of wild birds from farms merits particular mention because of the potential for wild birds (especially waterfowl) to harbour HPAI viruses. Wild birds may come into contact with farmed poultry directly (especially if the farmed birds are free-ranging) or indirectly (via contamination of feed and water). The latter pathway is especially important for farmed ducks reared on ponds and for farmed chickens whose drinking water is obtained from ponds. The use of nets to exclude wild birds should therefore be promoted in sector 3 farms. In Sector 3 farms interspecies segregation by fencing is achievable in the short- to medium-terms.
26. Where exclusion of wild waterfowl from ponds cannot be done, drinking water for poultry that is obtained from these sources should be treated or taken from uncontaminated sources such as

wells. In addition, possible contaminated water from ponds where waterfowl are kept should only be used for cleaning operations.

27. It is possible to reduce the risk of a HPAI outbreak and to improve control over a disease situation by limiting or modifying farming practices that would otherwise facilitate viral spread. For example, the practice of farming multiple species should be restricted; and the practice of raising and transporting waterfowl and quail with other poultry as well as pigs should be limited or eliminated; incentives should be provided to duck farmers to reduce the high-risk practice of moving duck flocks from harvested paddy fields over what can prove great distances; chicken faeces should only be used as fertilizers or livestock feed after appropriate treatment; and multi-age poultry farms should be restricted and wherever possible (especially in sectors 1-3) operate on an 'all-in, all-out' basis.
28. The Consultation also recognised that the implementation of improved hygiene and animal management and handling practices in the wet markets of Asia would contribute to limiting the spread of the HPAI virus (and other pathogens). In this regard:
 - During transport, measures should be implemented to reduce the risk of faecal contamination of roads and the area around markets when cages and poultry are brought to the market and off-loaded.
 - When introducing poultry to the market, it is important to maintain the separation of species that should occur along the length of the production and marketing chain. A very simple means of achieving this is to keep separate species in different cages.
 - Monitoring of birds in the market to continually assess their health or disease status is important as is regular surveillance, sampling and analysis. Sick and dead birds should be included in any surveillance, disposed of appropriately and necessary action taken for other birds in the market.
 - It is considered useful to separate the poultry selling area from other areas of the market. This will reduce the opportunity for poultry to contaminate the environment, other products and consumers not involved in the purchase of poultry.
 - It is considered good hygienic practice to regularly empty a market of all animals for a defined period while the market is cleaned and disinfected. Such action plays an important role in preventing the build-up of pathogens and should be considered even in AI-free countries and areas;
 - Cages can be modified for ease of cleaning and disinfection (e.g., wooden cages could be replaced by metal, plastic or other appropriate materials). Facilities for cleaning and

disinfection of transport cages before they are taken back to farms should be established.

- The arrangement of cages and their structure can be addressed so as to reduce cross contamination of chickens with faecal matter and pathogens from other poultry or birds (e.g., if cages need to be stacked on top of each other, chickens should not be placed below other poultry or birds; also a waste tray may be used underneath the cage).
 - The structure of cages can also be modified to reduce the risk of faecal contamination of the environment and humans (e.g., acrylic partitions can be used to reduce the contact between humans and poultry). In addition, the cages and trays may be collected and washed in a special room and appropriate waste treatment systems may be considered appropriate. Where humans and birds come into contact it is useful to also provide adequate hand cleaning facilities.
 - Traceability of birds back along the production and marketing chain is an important aspect of avian influenza control.
 - A biosecure and hygienic slaughtering process is essential for avian influenza (and other pathogen) control. Those involved in the slaughter of poultry in the market should also take the necessary precautions to avoid carrying any contamination outside the market.
29. A number of other regulatory controls that should be considered on a medium-term basis include the enhancement of biosecurity and management for poultry slaughterhouses and processing plants and movement control for poultry/birds raised for recreational activities.
30. Attention needs to be given to the social and economic costs that will be incurred as a result of HPAI risk reduction measures in marketplaces, slaughterhouses and processing plants. These costs need to be adequately foreseen and considered before planning and taking action. Costs may be incurred by governments and the private sector. For example, public funding may contribute to investment in infrastructure, publicizing activities, carrying out inspections, or compensating farmers for loss. Private market managers may contribute to re-organising market layout, provision of equipment, or additional cleaning. Market traders may lose income from rest days or other forced interruption of trading, which may not be made up by extra sales at other times. Publicly funded activities may draw from general taxes, or from levies on the livestock sector or joint public-private trust funds. In addition to financial costs, some risk reduction may require changes to well established habits, such as feeling (by touching and handling) the condition of a bird before purchase.

**SHORT TO LONG TERM RISK REDUCTION MEASURES TO
PROTECT HUMAN HEALTH FROM AVIAN INFLUENZA**

31. The application of control measures, some of which may result in or require the restructuring of the poultry sector, will have significant social and economic consequences as producers and traders in sectors 3 and 4 find themselves unable to meet new requirements. These impacts must be specifically addressed and mitigation measures must be foreseen and included in policy planning and implementation.
32. In addition to the often considerable economic costs, change of practice can be inconvenient and difficult and tends to be resisted. None of the countries included in the consultation has seen the spontaneous adoption of risk reduction practices, except by small groups of consumers switching to supermarket purchases. It has always been necessary to combine general awareness raising, regulation and long-term community action.
33. Education is an essential component of any AI prevention, control or eradication strategy. Establishing an education strategy is particularly important to reduce the public health risk, especially in sectors 3 and 4. This programme of education should include the provision of information on what influenza is, how it is transmitted as well as the identification and elimination of risk behaviours. The target audience for such education and awareness programmes on poultry diseases (including HPAI) should target farmers, at-risk rural and urban communities; NGO's; and other national and international organizations that are involved in promoting livestock for poverty alleviation.
34. In order to reduce the risk of avian influenza infection in people living with animals and handling of food in Asia, priority attention again needs to be given to those at highest risk. This would include: (i) women and children in resource-poor communities; low-income households who may share their living space with their animals; ethnic minorities who often live in remote areas; those involved in high risk food handling and consumption (e.g., those preparing chicken intestines or eating coagulated duck blood); those who have high-risk companion and prized birds; and village-to-village traders. In addition, attention should be also given to medical personnel, laboratory personnel and animal cullers.
35. Education strategies could include:
 - community awareness activities, school-based education programmes, and mass media (radio, television, print media etc) programmes;
 - community-based outreach and training activities where the community takes a participatory role; and
 - the use of (i) community champions or focal points who can also be active in community surveillance (it may be useful to provide such persons an incentive to implement surveillance and reporting); (ii) village volunteer workers; (iii) village veterinary workers; (iv) local authorities; (v) teachers; (vi) youth associations; and (vii) women's associations.

Before initiating such education strategies it would always be essential to have identified and initiated a programme of evaluation of education effectiveness in relation to its ability to bring about behaviour change.

CONCLUSIONS

36. If countries are to focus on situations where humans appear at greatest risk, priority must be given to sectors 3 and 4 farms and associated communities where humans live in very close proximity to the animals they or other community members are raising. However, there is still a need to reinforce biosecurity measures in sectors 1 and 2 also.
37. In the situation where there is a significant challenge from HPAI and biosecurity cannot be improved in a particular country or area, veterinary authorities should consider vaccination strategies in animals (as a part of a multi-element response to avian influenza) to better protect human health. In some countries or parts of countries massive vaccination could be the only way to first reduce the infection in poultry so as to further reduce human exposure and infection. In others, where stamping out without vaccination can be achieved, the authority of countries to prohibit the use of vaccination needs to be respected. The use of vaccination must be coupled to appropriate surveillance and must be carried out with appropriate products, manufactured and quality-controlled to ensure compliance with international standards referred to in the OIE Manual of Standards for Diagnostic Tests and Vaccines. Stamping out in case of outbreaks remains a primary measure to be implemented. The methods and tools to be used to prevent and control avian influenza have been fully described in the FAO document "*FAO Recommendations on the Prevention, Control and Eradication of HPAI in Asia*", which was prepared in collaboration with OIE in September 2004.
38. There is an urgent need to strengthen disease notification to human health and veterinary authorities, especially in association with sectors 3 and 4 farms, including considering all appropriate options to increase the willingness to report.
39. There is also an urgent need to know more about the virus and how it circulates. Thus one of the first areas for joint action for animal and health authorities should be to enhance the intelligence available to international organizations by providing more human and animal viruses for sharing with animal and human laboratory networks. Collaboration between the joint FAO/OIE network of avian influenza (OFFLU) and the WHO influenza network should be encouraged. Efforts should also be made to share data from seroprevalence studies, studies of infections transmitted among humans and studies of infections transmitted from animal to humans.
40. While there are a few key actions that are necessary in the short term, in the short- to medium-term there is also a need to implement good farming practices, including enhanced biosecurity, at poultry farms and associated premises; interspecies segregation by fencing on Sector 3 farms (segregation should apply to chickens,

ducks and pigs as well as quails and other relevant species); and by limiting or modifying farming practices that would otherwise facilitate viral spread.

41. In relation to legislation, although deficiencies in regulatory control were identifiable in a number of countries of the Region, the regulatory situations in these countries seem to be adjusting relatively quickly in response to the occurrence of outbreaks. Thus, while regulations could be further enhanced in the Region, the efficacy of regulatory enforcement remains an issue of greater concern. There remains, in many countries, a significant gap between legislation and enforcement, particularly in the least developed countries where there are limited human resources, infrastructure and financial resources. Such deficiencies result in less than optimal enforcement and an inability to effectively control HPAI. Major efforts need to be committed to enhancing governance and increasing effective enforcement of existing legislation.
42. Wherever possible legislation should aim to be risk-based. This allows regulators to focus on laws and regulations that when implemented will have an impact on the risk. In some areas, information on the epidemiology of the virus is limited. Hence, it is crucial to better understand the role of certain animal species such as wildlife and pigs in the epidemiology of avian influenza before authorities implement regulatory controls, in particular those relating to the culling of these animals.
43. To enhance regulatory controls, a number of supporting elements must also be in place, including improved disease awareness and communication at all levels from policy makers to grass root levels; resource mobilization to effectively enforce the regulations; information system and mapping of poultry distribution and movement flow to support decision-making; incentives such as adequate compensation to support the notification and stamping out measures; international support to facilitate the development of legislation; the active involvement of stakeholders in formulating new regulations; and research related to implementation of legislation (e.g., economic as well as social impacts of prevention and control measures).
44. The consequences of control measures, as well as the restructuring of the poultry sector, will have significant social and economic consequences. These must be specifically addressed and mitigation measures must be foreseen and included in policy planning and implementation.
45. There is a need also for an enormous effort to bring about behavioural change through education, awareness and health promotion. As in any effort to bring about change a diversity of approaches should be considered with an emphasis on community-based participatory action and mass media community awareness campaigns.
46. National, provincial and local authorities should also consider the appropriateness of the healthy settings approach and of other approaches in efforts to reduce the risks to human health

associated with the wet markets of Asia. In so doing, consideration should be given to describing the marketplace, identifying high-risk areas and practices in the market place; identifying the members of the market community; engaging champions and drawing up a prioritized list of possible changes to fit the local situation; identifying changes that may be relatively simple and likely to show positive impact and start with these; exploring various possible sources of finance; engaging the interest of politicians and local government. To address all the steps necessary, including those that relate to pre-market action, a medium- to long-term approach needs to be taken. The healthy markets approach uses a participatory process and inter-sectoral collaboration in a way that will allow effective control of avian influenza.

47. Recognition that developing a comprehensive approach to preventing and controlling avian influenza will have social and economic consequences which may impact greatest on sector 3 and 4 is essential. Therefore close attention must be given to ensuring that impacts are assessed in advance of implementing any strategy to reduce the risk of avian influenza to human health, and mitigation measures are built into the strategy.
48. Any comprehensive approach to avian influenza prevention and control will require significant technical and financial resources to be provided by the governments. However, as many low income countries are involved they are unlikely, on their own, to have sufficient resources to meet all requirements. The support of the international community is therefore crucial.

RECOMMENDATIONS

49. In order to reduce the risk of avian influenza to human health, it is essential to consider the countries according to their current situation. For those countries in which sectors 3 and 4 farms are a dominant feature of the production systems, or where humans live in very close proximity to the animals, and where the majority of human cases are occurring, there is an urgent need for:

Vaccination

- stamping-out of defined infected flocks to remain the primary measure to control HPAI in case of outbreaks.
- implementing vaccination programmes (as part of a multi-element response) in particular in sector 4 farms.
- coordinating vaccination programmes with surveillance and monitoring activities for virus circulation and evaluation of programme efficacy.
- vaccination to be carried out with appropriate products, manufactured and quality-controlled to ensure compliance with international standards referred to in the OIE Manual of Standards for Diagnostic Tests and Vaccines.

- sector 4 farmers in areas where HPAI is endemic, to identify sources of suitable expertise and funds. In such circumstances, and given that vaccination of backyard chickens will benefit the wider poultry sector and reduce risks to human health, there is justification for financial support from governments.

Improving Biosecurity

- upgrading of sector 3 farms through improved biosecurity (e.g., by fencing, netting, species segregation), increased surveillance and banning certain high risk farming practices (e.g., use of contaminated water, recycling of poultry faeces).

50. However, while the above priority actions are necessary in the less biosecure farms and communities, in all sectors there still remains a need for:

HPAI epidemiology, diagnosis and vaccination measures

- undertaking joint medical/veterinary epidemiological analysis to better understand risk contamination pathways between infected animals and humans.
- strengthening veterinary services to improve capacity to implement services including surveillance sampling and analysis.
- additional research to be undertaken in areas such as epidemiology, vaccines and rapid diagnostic tests.

Legislation

- strengthening legislation in key areas of outbreak management as a short-term priority concern.
- overcoming the significant gap between legislation and enforcement, particularly in the less developed countries, by strengthening veterinary services, human resources and infrastructure and by ensuring adequate financial resources are available to authorities to address this important public health function.
- ensuring a number of supporting elements must also be in place to enable legislation to be effectively enforced. One very important supporting element in the short term is the implementation of incentives such as adequate compensation to support notification and stamping out measures.

Education

- establishing an education strategy is particularly important to reduce the public health risk, especially in sectors 3 and 4. Implementing effective education as a particularly

important means of reducing the risk to those producing, marketing and living with poultry, especially in sectors 3 and 4 farms.

Taking action in the wet markets of Asia

- taking action at an appropriate level (national, provincial, local authority or market level) to enhance the biosecurity of the wet markets in Asia in order to reduce their role in the emergence and persistence of avian influenza.

**CALL TO ACTION BY COUNTRIES OF THE REGION
AND SUPPORT FROM THE INTERNATIONAL COMMUNITY**

51. Countries are urged to take guidance from the findings of the Consultation in developing, modifying and implementing their national avian influenza prevention and control programmes.
52. As a consequence of the significant public health concern associated with the avian influenza situation in animals there is also an urgent need for more investment in preventing, controlling and eradicating avian influenza disease in Asia. There is an urgent need for assistance from the international community to enable infected countries to put into place vaccination programmes and initiate improved biosecurity in sector 3 and 4 farms. At the same time, there is a need for the long-term sustainability of such programmes from national funds to be addressed.
53. Without substantial national and international financial and technical support, avian influenza will continue to be a significant public health and animal production issue in many countries in Asia and the risk of a human influenza pandemic occurring will remain.