Ministry of Agriculture
and Rural Development

Ministry of Health

VIETNAM INTEGRATED NATIONAL OPERATIONAL PROGRAM ON AVIAN INFLUENZA, PANDEMIC PREPAREDNESS AND EMERGING INFECTIOUS DISEASES (AIPED), 2011-2015

Strengthening responses and improving prevention through a One Health approach.

October 2011

THE VIETNAM INTEGRATED NATIONAL OPERATIONAL PROGRAM ON AVIAN INFLUENZA, PANDEMIC PREPAREDNESS AND EMERGING INFECTIOUS DISEASES (AIPED), 2011-2015

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PREFACE

Avian influenza viruses of the H5N1 subtype emerged as a serious cause of disease in poultry and humans in Vietnam in late 2003. Concerted efforts by the government and people of Vietnam at all levels, supported by international partners including donors, international development banks and international agencies, have reduced the incidence of disease in both poultry and humans.

The activities undertaken over the past five years have been guided by the first *National Integrated Operational Program for Avian and Human Influenza (OPI), 2006-2010*. The mid-term review of the OPI recommended that a new program should be developed for the subsequent 5 years (2011-2015) and that the scope of the program should be expanded to cover other potentially serious emerging and re-emerging diseases.

Vietnam hosted the International Ministerial Conference on Animal and Pandemic Influenza (IMCAPI) in April 2010 in coordination with the European Union and the United States of America, with the support of the United Nations and other international organizations. Representatives of 71 countries and regional bodies as well as representatives of international technical organizations, development banks and other stakeholders within the development community attended the conference. Based on the global experiences from influenza A(H5N1) and the 2009 human influenza A(H1N1) pandemic the meeting reiterated

> "*…the importance of international and regional cooperation, national political commitment, inter-sectoral collaboration, timely and transparent communication, and capacity building as essential to build a health system which is capable to address emerging threats, such as animal and human influenza, and to ensure effective pandemic readiness and response across different sectors."*

It also reaffirmed the need for

> *"…sustained, well-coordinated, multi-sector, multi-disciplinary, community-based actions to address high impact disease threats that arise at the animal-human-environment interface.*"

Vietnam is committed to elimination of H5N1 HPAI and to early detection and prevention of emerging/re-emerging infectious diseases but cannot do so alone. The need for ongoing international cooperation and support was also highlighted at IMCAPI, which concluded:

> "*… that there is a need for the international community, led by the international technical agencies and development banks, to address the fundamental gaps in public health and animal health systems so as to reduce the impact of zoonoses, avert potential pandemics of animal origin, and mainstream investments and capacity in country health systems*."

This document describes the program of activities related to avian and human influenza and other potentially serious emerging/re-emerging infectious diseases that the Government of Vietnam intends to implement during the next 5 years. It provides indicative costs of these activities and, where possible, breaks down activities into those that will be funded by the Government of Vietnam and those that can only be fully undertaken with support from donors.

Technical inputs and financial assistance for the preparation of this programme were provided by USAID and the Government of Vietnam-United Nations Joint Programme on Avian Influenza.

OBJECTIVES OF THE PLAN

The overarching objective of the integrated national operational program for 2011 to 2015 is to **reduce the risk to humans and animals from avian influenza A(H5N1) and other emerging infectious diseases** by:

- Controlling infectious diseases at source and implementing appropriate measures to prevent disease emergence/re-emergence;
- Detecting and responding rapidly and appropriately to cases of new and emerging high impact diseases in both animals and humans;
- Enhancing preparations for the health and non-health consequences of any severe pandemic disease of humans.

The document describes mechanisms that will be used to achieve these objectives including:

- Building on the existing framework for MARD, MOH and other government and non-government agencies to work together, improving on recent developments, sustaining partnerships and meeting international core requirements for preparedness for and response to emerging infectious diseases and pandemics.
- Providing a structure for domestic and international resource mobilization to enhance and sustain critical functions, to address gaps and to facilitate donor coordination to support the activities and the integrated program.
- Building the evidence base for public health policy, risk communication and public health action to address emerging infectious diseases.
- Applying a One Health approach that recognizes the risks arising at the interface between animal health (both domestic and wild animal species), human health and eco-system health, noting that the majority of new human diseases globally over the past 60 years have originated in animals.

ACRONYMS AND ABBREVIATIONS

ADB..... *Asian Development Bank*

AHI..... *Avian and Human Influenza*

AHW..... *Animal Health Workers*

AI..... *Avian Influenza*

APEC..... *Asia-Pacific Economic Cooperation*

APSED..... *Asia Pacific Strategy for Emerging Diseases*

ASEAN..... *Association of Southeast Asian Nations*

BSL..... *Bio-security Level (Laboratory)*

CDC..... *US Centre for Disease Control and Prevention*

CHE..... *Centre for Health Education and Communications*

CIRAD..... *International Research Centre for Agriculture and Development*

CITES..... *Convention on International Trade in Endangered Species*

DAH..... *Department of Animal Health, MARD*

DLP..... *Department of Livestock Production, MARD*

ECTAD..... *Emergency Centre for Trans-boundary Animal Diseases*

EC..... *European Commission*

EU..... *European Union*

EID..... *Emerging Infectious Diseases*

EPT..... *Emerging Pandemic Threats*

EWARS..... *Early Warning and Response System*

FAO..... *Food and Agriculture Organization*

FPD..... *Forest Protection Department*

GDP..... *Gross Domestic Product*

GDPM..... *General Department of Preventive Medicine, MOH*

GoV..... *Government of Vietnam*

HCMC..... *Ho Chi Minh City*

HCS..... *Hanoi Core Statement on Aid Effectiveness*

HCW..... *Health Care Workers*

HPAI..... *Highly Pathogenic Avian Influenza*

ICD..... *International Cooperation Department*

IDA..... *International Development Association*

IFRC..... *International Federation of Red Cross and Red Crescent Societies*

IEC..... *Information, Education and Communication*

IMCAPI..... *International Ministerial Conference on Animal and Pandemic Influenza*

MARD..... *Ministry of Agriculture and Rural Development*

MOET..... *Ministry of Education and Training*

MOF..... *Ministry of Finance*

MOIC..... *Ministry of Information and Communications*

MOH..... *Ministry of Health*

MONRE..... *Ministry of Natural Resources and Environment*

MPI..... *Ministry of Planning and Investment*

NAEC..... *National Agriculture Extension Centre*

NGO..... *Non-Governmental Organization*

NSCAI..... *National Steering Committee for Avian Influenza Control and Prevention*

NSCHP..... *National Steering Committee for Human Influenza Pandemic Prevention and Control*

UN OCHA.... *United Nations Office for the Coordination of Humanitarian Affairs*

ODA..... *Official Development Assistance*

OIE..... *Office International des Epizooties (World Organization for Animal Health)*

OPI..... *National Integrated Operational Program for Avian and Human Influenza, 2006-2010*

PAHI..... *Partnership for Avian and Human Influenza Control*

PPE..... *Personal Protective Equipment*

SARS..... *Severe Acute Respiratory Syndrome*

TF..... *Trust Fund*

UN..... *United Nations*

UNDP..... *United Nations Development Program*

UNICEF..... *United Nations Children's Fund*

USAID..... *United States Agency for International Development*

VNRC..... *Vietnam Red Cross*

WB..... *World Bank*

WHO..... *World Health Organization*

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EXECUTIVE SUMMARY

Avian influenza viruses of the H5N1 subtype emerged as a serious cause of disease in poultry and humans in Vietnam in late 2003. The activities undertaken over the past five years have been guided by the *National Integrated Operational Program for Avian and Human Influenza (OPI), 2006-2010*. The mid-term review of the OPI recommended that a new program should be developed for the subsequent 5 years (2011-2015) and that the scope of the program should be expanded to cover other potentially serious emerging and re-emerging diseases. This was affirmed by the International Ministerial Conference on Animal and Pandemic Influenza (IMCAPI) hosted by Vietnam in April 2010.

The Vietnam Integrated National Operational Program on Avian Influenza, Pandemic Preparedness and Emerging Infectious Diseases (AIPED), 2011-2015 describes the program of activities related to avian and human influenza and other potentially serious emerging/re-emerging infectious diseases that the Government of Vietnam intends to implement during the next 5 years.

A. BACKGROUND

Highly Pathogenic Avian Influenza, Pandemic (H1N1) 2009 and other Emerging Infectious Diseases in Vietnam

Highly pathogenic avian influenza (HPAI) of the A(H5N1) strain continues to circulate in poultry with sporadic cross over into humans. Vietnam has reported 119 confirmed human cases (59 fatal) as of March 2011. Reported cases among humans and poultry have fallen since 2004-05, suggesting that control and prevention measures are working, however further work is required to address HPAI through effective prevention, early detection and response. Lessons learned in Vietnam are of benefit both for HPAI strategies within the Asia region and for tackling other endemic and emerging diseases.

Pandemic (H1N1) 2009 demonstrated the rapid global spread a new disease strain and served as a test of the pandemic readiness developed in relation to the threat from HPAI.

Other Emerging Infectious Diseases (EIDs) affecting Vietnam include transboundary livestock diseases and emerging zoonotic diseases. Commercial farming of wild animal species and the wildlife trade pose an ongoing risk. Experiences from SARS, HPAI and pandemic (H1N1) 2009 have seen a gradual shift from crisis driven responses to consideration of sustainable preparedness, response and prevention activities for known and unknown communicable diseases.

Economic impact of HPAI has been limited beyond the initial macroeconomic impact of widespread outbreaks, but high for some poultry producers and

processors and for government. Influenza and other emerging diseases have a significant ongoing global cost and a much higher potential cost in the case of a severe pandemic. It is important to sustain investments in pandemic preparedness and response with commensurate spending on prevention.

Achievements and Lessons Learned during the period 2006-2010

General achievements in national planning have included high-level political commitment; the application of a multi-sector approach to HPAI and pandemic preparedness at all levels; and strengthening collaboration between the human health and animal health sectors. Achievements in the animal health and livestock production sectors have included strengthening of veterinary services including the laboratory network; improvements in disease control; training and expansion of active and passive surveillance and epidemiological investigations; restructuring of the poultry industry; and promotion of public awareness and behavioural change. Achievements in the human health sector include enhanced surveillance and response capacity; legislative development and strengthening of the preventive health sector; provision of equipment, training, guidelines and hospital upgrading for the curative health sector; promotion of public awareness and behavioural change; and enhanced coordination of research activities.

Important lessons learned in Vietnam in the past 5 years as a result of experiences dealing with HPAI and pandemic (H1N1) 2009 have been applied in the development of this program.

Policy Framework and Government Interventions

Animal health policy has shifted from a short-term emergency response to a longer-term agenda, focusing on managing the expansion of the poultry/livestock sector, and improving the capacity of veterinary and animal Human health policy focuses on addressing the risk of HPAI to human health, and preparing for a potential human pandemic. A One Health approach is increasingly being adopted, reflecting a move to a more comprehensive, integrated approach to zoonotic disease threats including attention to other livestock species and wildlife.

B. OBJECTIVES OF THE AIPED, 2011-2015

The overarching objective of the integrated national operational program for 2011 to 2015 is to reduce the risk to humans and animals from avian influenza A(H5N1) and other emerging infectious diseases by:

- controlling infectious diseases at source and implementing appropriate measures to prevent disease emergence/re-emergence;
- detecting and responding rapidly and appropriately to cases of new and emerging high impact diseases in both animals and humans;

- enhancing preparations for the medical and other consequences of any severe pandemic disease of humans.

These objectives align with the International Health Regulations (IHR 2005), the latest iteration of the Asia-Pacific Strategy for Emerging Diseases (APSED 2010) the FAO/OIE Global Strategy for avian influenza, and key overall national socio-economic development plans, sector strategies, programs and projects.

C. DESCRIPTION OF THE PROGRAM

Component I - Enhanced Coordination Activities

National coordination mechanisms established by the Prime Minister include the National Steering Committee for Avian Influenza (NSCAI) and the National Steering Committee for Human Influenza Pandemic Prevention and Control (NSCHP). Similar steering committees exist in all provinces and at lower levels. These mechanisms should be reviewed in the coming period, taking into account their role in responding to HPAI, the pandemic (H1N1) 2009 and other animal and human diseases, incorporating wildlife and other issues as part of a One Health approach.

Support to central and provincial coordination is the responsibility of MARD and MOH with guidance and coordination through the steering committees at each level. To consolidate and further enhance inter-sectoral coordination, a key activity will be the finalization, adoption and implementation of a joint ministerial circular that is currently under development by MARD and MOH.

International cooperation and donor coordination will be addressed through continuation of the Partnership for Avian and Human Influenza. The design of the Partnership should take into account the expanded scope of this plan compared to the OPI, as well as any changes to the overall national coordination mechanisms. The Partnership and its Secretariat will support mobilization of financial and technical resources for implementation of AIPED 2011-2015; facilitate information and sharing of policy and technical discussions; and identify opportunities for enhanced coordination, linkages and mainstreaming of AIPED activities with related agencies, sectors, projects and programs.

Strengthening engagement with civil society and the private sector will be important in the coming period in both the animal health and livestock production sectors and the human health sector.

Communications, public awareness and behavioural change will continue to evolve from a primary focus on public awareness raising to implementing behaviour change communications and assessing which approaches and models are most successful in Vietnam. The AHI Behaviour Change Working Group will review the existing strategic framework for AHI communications and develop a new detailed communications strategy in support of the plan for 2011-2015.

Program monitoring and evaluation will measure the progress in implementing this plan and achieving impact in line with its overall objectives. The implementing agencies will be responsible for monitoring and evaluation for the program activities they undertake. Overall monitoring and evaluation of the 2011-2015 will be carried out by the NSCAI, with the NSCHP playing a complementary role for pandemic preparedness and related aspects. PAHI Secretariat will play a supporting role to facilitate and consolidate inputs from national and international agencies for overall monitoring and evaluation.

Support for regional and international activities will facilitate involvement of senior officials in key regional and international cooperation activities, taking into account the global and regional nature of the challenges posed by animal and human emerging infectious diseases. Key international activities include the International Health Regulations (IHR 2005), the OIE Animal Health Code, the continuation of the international ministerial meetings and senior official's meetings following IMCAPI Hanoi 2010, and participation in overall meetings and health and agriculture working groups of regional groupings including APEC and ASEAN.

Component II – HPAI control and eradication and strategy for emerging infectious diseases in the Agricultural Sector

A strategic approach to HPAI and other emerging diseases

As anticipated in the OPI, Vietnam is in the *Consolidation Phase,* in which gains made so far in controlling and preventing HPAI are being maintained, some modifications to the poultry industry are occurring, farms in the industrial sector are demonstrating freedom from HPAI, and disease-free compartments are being planned. It is expected that HPAI will not be eliminated from poultry in the next five years but the risk of infection for poultry and humans will be reduced. A range of control and preventive measures will be applied in different parts of the poultry sector and in different agro-ecological zones.

Efforts will continue to contain and progressively control major transboundary diseases, with these efforts linked to each other wherever possible. Addressing the role of wildlife in disease transmission will require close coordination between related agencies within MARD; between MARD, MOH and other ministries; and between equivalent sectors at sub-national levels. International and regional cooperation on emerging transboundary diseases will continue. Significant ecological changes, including those resulting from land use change, should be monitored for potential effects on disease emergence.

Veterinary and animal production services require further significant investments for progressive HPAI control and elimination and for action on emerging infectious diseases. OiE reviews have contributed to the development of a 5-year plan for strengthening of veterinary services as part of the overall animal health strategy. Key identified activities include introduction of a veterinary statutory body; participation of senior officials in international

meetings; strengthening linkages between central and local veterinary services; animal health legislation; investments in the network of veterinary laboratories; strengthening incentives for public veterinary field services and enhancing linkages with the private sector and the extension system; enhancing epidemiology training and activities; and enhancing veterinary quarantine and border health services as well as veterinary public health services.

Key identified activities to strengthen public and private animal production services include a review of the scope and current status of animal production services; training on livestock development plans, farm biosecurity, and market hygiene and traceability systems; application of good animal husbandry practices (GAHPs) for livestock farms of different sizes; and strengthening the public-private relationship in the livestock sector.

Disease control and prevention activities aim to improve the response to HPAI and other new diseases, including those that have major public health implications. Key identified activities include development and implementation of national and provincial disease control and prevention plans; review of vaccination/disease control and prevention strategies; replacement of emergency supplies and additional training in their use; applied research into HPAI and other EIDs and the use of vaccination; implementation of compartments for the poultry sector; review of existing livestock health programs for small-scale producers; and maintaining international cooperation.

Surveillance and epidemiological investigation activities will maintain and enhance active and passive surveillance systems for HPAI and other EIDs, allowing assessment of control programs and modification of approaches, detection of outbreaks, enhanced understanding of disease transmission and demonstration of disease-free status of compartments. Key identified activities include diagnosis of samples from disease outbreaks in livestock and other animals; disease outbreak investigations (including joint investigations with human health staff); active surveillance in selected markets and slaughterhouses; wild animal surveillance and studies; improvements to databases for surveillance and disease investigations; training; studies on key risk points for transmission and on incentives for disease reporting; surveillance for compartments; and improved modelling of selected diseases based on improved field data.

Modifications to the livestock sector will address HPAI and other disease risk factors in the way livestock and commercially-farmed wildlife are reared, transported sold and processed. Key identified activities for the livestock sector include preparation and review of national and provincial livestock plans as well as plans for production zones; continuing the operation of the Biosecurity Working Group; developing biosecurity standards and audits; upgrading of slaughterhouses and retail markets; GAHP application and certification; systems for tracing of poultry and other animal species; risk management in free grazing duck production in the Mekong; support for hatcheries and associated market

chains; risk management in farm rearing of wildlife; and waste treatment systems and managing livestock waste risks.

Communications and extension activities for the animal health and livestock production sectors will address raising awareness and promoting behaviours associated with: (1) the timely reporting of diseases in livestock and wildlife; (2) application of good animal health practices in livestock and wildlife farming and trade; (3) safer livestock and wildlife handling practices in slaughtering, transport and marketing; and (4) communication about key policies, programs and regulations related to the animal health and livestock production sectors.

Component III - Pandemic Preparedness and influenza and emerging infectious disease prevention in the Health Sector

This component outlines activities related to enhancing national preparedness planning, strengthening surveillance, response, clinical and laboratory based diagnostic capacity, curative care services, preventive medicine units, communications related to behaviour change, risk and operations, and biomedical, social and other research.

National preparedness for a new strain of influenza or another novel infectious disease is an important national task that covers both the health sector and other sectors, taking into account potential impacts on both human health as well as many other important aspects including ensuring the continuity of essential services and infrastructure, effective public communications, dealing with absenteeism, addressing macroeconomic and livelihoods impacts, managing impacts on movement of people and goods within the country and across national borders and the impacts on trade and tourism, and a wide range of other issues.

Key identified activities include revision of national plans; operational planning and simulation exercises; integration of HPAI and pandemic preparedness activities into the control framework for a range of communicable diseases; and addressing prevention of priority zoonotic disease threats to human health, extending the focus of these from the health of poultry to other livestock and wildlife, also considering the health of the agro-ecosystems within which animals and humans reside and interact.

Strengthening surveillance and response activities will consolidate and strengthen improvements to the routine surveillance system for human avian influenza cases and for 26 nationally notifiable communicable diseases. This will include scaling-up electronic reporting mechanisms and disseminating the new Law on Communicable Disease Control; including private health care providers in disease surveillance; and coordinating with the animal health sector in the case of zoonoses and with neighbouring countries on cross-border issues. Other identified activities include sentinel surveillance for seasonal influenza; monitoring viral drug resistance and antibiotic susceptibilities of bacteria; facilitating rapid investigation and containment activities through the

development of rapid response teams; and the Field Epidemiology Training Program (FETP). Consideration should also be given to scaling up and replicating pilot programs on community-based surveillance.

Strengthening diagnostic capacity will require further strengthening of the diagnostic laboratory network, including quality assurance mechanisms, training and maintenance of facilities. The performance of laboratories during the 2009 influenza H1N1 pandemic needs careful review as a basis for improving laboratory pandemic preparedness plans. Rapid point-of-care testing for influenza should be assessed. Collaboration with animal health laboratories should also be enhanced to address zoonoses.

Strengthening curative care and preventive health capacity will require further improvements in situation assessment and planning for surge capacity, improving treatment capacity and better defining the role of specialist curative sector rapid response teams. Availability and utilization of facilities and equipment for patients with influenza and emerging diseases should be improved. Infection care should also be improved throughout the curative care system. Lessons from the pandemic (H1N1) 2009 should be applied as part of ongoing capacity-building to respond to an influenza pandemic.

Improving research will focus on seven priority areas during 2011-2015, including epidemiological studies of human and avian influenza; risk factors for highly pathogenic influenza virus; interaction of influenza viruses in humans and animals; the evolution of influenza viruses in humans and animals; community spread of influenza viruses; rapid diagnostic tests for influenza virus, particularly point of care tests; and vaccine development.

Public awareness, behavioural change and other communications for the health sector will address promotion of behaviours associated with: (1) timely reporting of human disease; (2) improved personal hygiene and food safety; (3) compliance with medical regulations; (4) improved containment response if human-to-human transmission occurs; and (5) preparedness to mitigate and recover from a serious pandemic.

D. CHALLENGES

Competing priorities and a lessening of the focus on HPAI and pandemic preparedness globally contribute to challenges in sustaining national and international resources, political will and administrative commitment at all levels. Other key challenges include strengthening integration of activities between sectors; reducing reliance on poultry vaccination while maintaining disease control; applying a One Health approach; replicating and scaling-up pilot models; balancing central command and control mechanisms with the reality of decentralization; and ensuring sufficient quantity and quality of human resources and adequate incentives for staff and collaborators at all levels.

E. MONITORING AND EVALUATION

Three key indicators for success in terms of the overall impact of the program on achieving the program objectives with regard to HPAI and other emerging diseases in animals and humans by 2015 are as follows:

1. Halving the 3 year rolling average of locally acquired human cases of influenza A(H5N1) per annum by 2015, with no cases in poultry in disease-free compartments.
2. Halving the ongoing rolling average of H5N1 virus-positive poultry/environmental swabs in sentinel markets and slaughterhouses.
3. Time from field reporting to diagnosis and implementation of appropriate action for any suspected HPAI case is a maximum of 72 hours, for other known emerging diseases in livestock and wild life is a maximum of 14 days, and for any new disease is 30 days.

A set of core indicators for each sector has been selected based on the piloting of the monitoring and evaluation framework for the OPI. Progress will be also be tracked over the five year implementation period of the plan against a series of annual milestones for key outputs.

F. FINANCIAL MANAGEMENT AND ESTIMATED BUDGET

Substantial financial resources have been invested in the period 2006-2010, with more than $200 million committed, including at least $70 million from Government and $132 million from ODA sources. Most of these resources have been delivered as of mid-2011.

There is a need to continue strengthening veterinary services and livestock development, with a focus on overall capacity development for new and emerging diseases, and to broaden the animal health focus to address wildlife species as well. Similarly, gaps remain in pandemic preparedness planning and the ability of the Government to counter a more severe pandemic than seen in 2009 or to respond to multiple simultaneous public health threats.

The total cost for implementation of the plan over the period 2011-2015 is estimated at 8,069 billion VND (equivalent to 384 million USD). Based on the proposals of MARD and MOH, it is estimated that 3,789 billion VND (equivalent to 180.46 million USD) could come from State budget resources (47 percent of the total costing), and 4,279 billion VND (equivalent to 203.78 million USD) is requested from ODA (53 percent of the total costing). Investments from the private sector are not included in this cost estimate.

The request for international ODA reflects the importance of these investments as contributing to a global good in terms of disease prevention and control and macro-economic stability, and also reflects the ongoing need for international support for activities beyond the capacity of the national system and internal resources.

A. BACKGROUND

HIGHLY PATHOGENIC AVIAN INFLUENZA, PANDEMIC (H1N1) 2009 AND OTHER EMERGING INFECTIOUS DISEASES IN VIETNAM

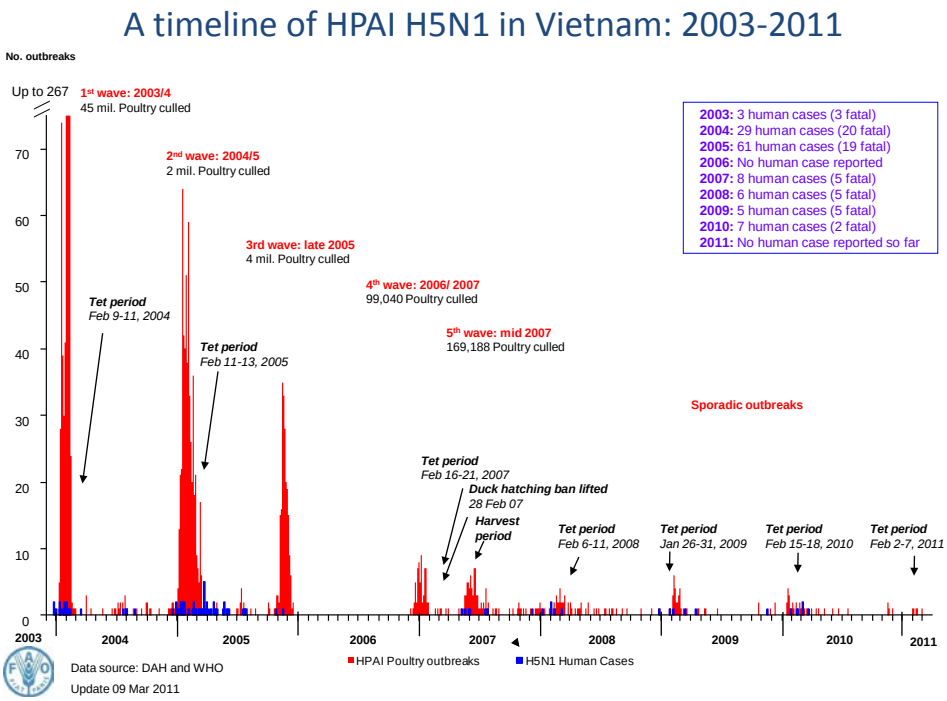
Current Status of Highly Pathogenic Avian Influenza (HPAI) in Vietnam

Highly pathogenic avian influenza (HPAI) viruses of the H5N1 subtype continue to circulate in poultry in Vietnam with sporadic cross over into humans and other species. As of March 2011, Vietnam has reported 119 confirmed human cases of influenza A(H5N1) of which 59 were fatal. This represents 23% of the total number of human cases reported worldwide and 19% of the deaths; only Indonesia (172 confirmed cases) and Egypt (127) have had more cases and only Indonesia has had more deaths (142).

Table 1 Human cases of Influenza A(H5N1) in Vietnam (cases/ fatalities)

2003	2004	2005	2006	2007	2008	2009	2010	2011[1]	Total
3/3	29/20	61/19	0/0	8/5	6/5	5/5	7/2	0/0	119/59

Since the peak in cases among humans and poultry in 2004-05, the number of reported cases of H5N1 HPAI has fallen in Vietnam, suggesting that the measures taken to control and prevent this disease are working. (Figure 1)



[1] To 10 March 2011

Nonetheless, a small number of people continue to be infected each year with all of the factors leading to infection of poultry and humans remaining incompletely understood.

In Vietnam, the rapidly changing livestock sector, strong political and operational support, and improving collaboration between animal and human health sectors for surveillance, outbreak responses, planning and research provide an opportunity to better understand the epidemiology of HPAI and to develop effective multi-sectoral strategies encompassing prevention, early detection and response. Lessons learned in Vietnam are of benefit in addressing HPAI throughout the region, and have utility in tackling a broad range of endemic and emerging diseases locally, regionally and globally.

Pandemic (H1N1) 2009

The recent human influenza pandemic demonstrated how rapidly a disease that emerges in one part of the world can spread globally.

Pandemic (H1N1) 2009 was caused by a novel strain of influenza A(H1N1) in humans that was first detected in Mexico in late April 2009. On 11 June 2009, WHO announced that, based on expert assessments of available evidence, the scientific criteria for an influenza pandemic had been met. On 10 August 2010, WHO officially declared the shift to the post-pandemic phase.

The first confirmed case of the new strain of influenza A(H1N1) in Vietnam was reported on 30 May 2009 in a student who had returned from North America on 26 May 2009. In mid-July 2009, it was reported that the new strain had been reported in a school in Ho Chi Minh City and had spread into the community. The number of reported cases peaked in the second half of 2009, with more than 11,000 laboratory-confirmed cases reported from June to December 2009.

The national response to the pandemic (H1N1) 2009 has been coordinated by the National Steering Committee for Human Influenza Pandemic Prevention and Control (NSCHP), chaired by the Minister of Health. This response has drawn heavily on the pandemic preparedness and response capacity and plans developed in relation to the threat from HPAI. In many ways the national response to pandemic (H1N1) 2009 served as a test of pandemic readiness and focused attention on such issues as when to move from containment to mitigation, the global rollout of human vaccination as part of an emergency response, as well as dealing with school closures and the challenge of effective business continuity planning.

Other Emerging Infectious Diseases (EIDs)

A range of important transboundary livestock diseases and emerging zoonotic diseases occur in Vietnam, including foot-and-mouth disease, Newcastle disease, and classical swine fever. Recently emerged strains of porcine respiratory and reproductive syndrome (PRRS) virus are causing severe losses for pig farmers and changes to livestock farming to combat HPAI could result in increases in food borne illnesses and

the emergence of new pathogens. Canine rabies remains endemic with spill over to humans. Commercial farming of wild animal species for human consumption and the wildlife trade within and through Vietnam also pose an ongoing risk for the emergence of new diseases; however, very little research has focused on investigating diseases in wild animal populations to date.

The unforeseen outbreak of severe acute respiratory syndrome (SARS) in 2002-03 caused 63 cases and 5 deaths in Vietnam. Experiences from this event coupled with experiences with HPAI and pandemic (H1N1) influenza have seen a gradual shift from crisis driven responses to consideration of sustainable activities that have longer-term utility for preparing, responding and even preventing a range of known and unknown communicable diseases. This now includes the development of measures to address underlying vulnerabilities and risks to zoonotic infections. These aspects were publicly endorsed in the Hanoi Declaration:

> "*National experiences during the pandemic (H1N1) 2009 have reinforced the need for sustained, well-coordinated, multi-sector, multi-disciplinary, community-based actions to address high impact disease threats that arise at the animal-human-environment interface.*"

ECONOMIC IMPACT

The economic costs of H5N1 HPAI in Vietnam have been limited at the macro-economic level following the initial period of widespread outbreaks, but costs have been high for some poultry producers and processors and for government. The costs so far incurred are mostly related to the effects on livelihoods due to the mass deaths of domestic birds from the disease itself, closure of markets and the culling of poultry to stem its spread, effects which have disproportionately affected women, the poor, and rural/peri-urban residents. Significant costs have also come with government expenditures on equipment, materials, vaccination campaigns, transport and personnel to contain the epidemic, and the contributions to these efforts by donors and international financial institutions.[2]

Although the disease remains largely one of poultry with occasional spill over into humans, it is the potential for this agent to become readily transmissible between humans causing a severe influenza pandemic that is the main driver for investments to control this disease. In one recent assessment influenza pandemics represent a more severe global threat than tropical storms, earthquakes and financial crises, in terms of the probability of occurrence and the impact on human life, livelihoods and the economy.[3]

Beyond influenza, numerous case studies illustrate the detrimental economic impacts of emerging diseases that extend well beyond the health sector. For instance, lost workdays, travel and trade worldwide from *SARS* (2002-03) amounted to US$11billion[4]; and the economic impact of *emerging infectious diseases* on people,

[2]World Bank, Economic Impact of Avian Flu http://web.worldbank.org/WBSITE/EXTERNAL/COUNTRIES/EASTASIAPACIFICEXT/EXTEAPREGTOPHEANUT/0,,contentMDK:20713527~pagePK:34004173~piPK:34003707~theSitePK:503048,00.html

[3] World Economic Forum, *Global Risks 2009*, http://www.weforum.org/pdf/globalrisk/2009.pdf

[4] Robertson, J (2003). *The Economic Costs of Infectious Diseases.* Research Note no. 36. 2002-03, Parliament of Australia.

livestock and crops in the US is valued at more than US$41 billion each year.[5] Viewed in these terms, it is important for Vietnam to sustain investments in generic pandemic preparedness and response to mitigate health *and* non-health impacts with commensurate spending on prevention to avert the emergence of indigenous infectious disease threats.

ACHIEVEMENTS DURING THE PERIOD 2006-2010

This section provides information on the major achievements during the 5 years from 2006-2010.

General achievements in national planning

- Vietnam has progressively built upon experiences from SARS and plans developed in 2005 to address HPAI and human influenza pandemics. The original and subsequent plans have all been founded on a multi-sectoral approach, in particular bringing MARD and MOH together to address common issues of planning and policy, surveillance and early warning systems, rapid response and containment, risk communication and service provision. The People's Committees at provincial and lower levels have been tasked with increasing responsibility for coordinating communicable disease prevention and control. As such, it was intended that actions to address HPAI and preparedness for a human influenza pandemic would be of value for strengthening the health system's capacity to counter other emerging infectious diseases, especially zoonoses.
- Political commitment and support at the highest levels has been steadfast, and Vietnam has been forthcoming in reporting animal and human cases of avian influenza.
- The agriculture and health sectors have mobilised at all levels and provided leadership in the national response.
- The strengthening collaboration between human health and animal health agencies, between departments within both these sectors, and externally to other sectors provides a solid foundation to develop more integrated, comprehensive responses.
- The infrastructure and capability of human health facilities, animal health services and human and animal health laboratories have been boosted. Training activities have been carried out for staff in the health and animal health and livestock production sectors, covering a broad range of topics including epidemiology, laboratory techniques and quality management and infection control.

The table below summarises key developments in national planning for HPAI, pandemic influenza and communicable disease control.

[5] Daszak, P. et al. (2000). Emerging Infectious Diseases of Wildlife- Threats to Biodiversity and Human Health. *Science* 287: 443-449

Key developments in national planning for HPAI, pandemic influenza and communicable disease control

DATE	DEVELOPMENT	DETAILS
Jan 2004	Establishment of the National Steering Committee for Avian Influenza Control	Decision No. 13/2004/QD-TTg
Mar 2004	Establishment of the National Steering Committee for Human Influenza Pandemic Prevention and Control (evolved from the National SARS Steering Committee)	Decision No. 297/GDD-TTg
Oct 2005	Mass vaccination of poultry commences	
Nov 2005	National Preparedness Plan in Response to Avian Influenza Epidemic H5N1 and Human Influenza Pandemic	Approved by Prime Minister
Nov 2005	National Plan of Action on Human Influenza Pandemic Prevention and Control in Vietnam	Decision No. 38/2005/QD-BYT Approved by MOH
Jan 2006	Integrated National Plan for Avian Influenza Control and Human Pandemic Influenza Preparedness and Response, 2006-2008	RED BOOK
Feb 2006	Official decision for the National Steering Committee for Human Influenza Pandemic Prevention and Control revised	Decision No. 348/2006/QD-TTg
May 2006	Integrated National program for Avian and Human Influenza (OPI), 2006-2010	OPI (also known as the Green Book)
Nov 2007	Development of the Inter Ministerial Coordination Plan in Avian Influenza Control	Decision No. 1532/QD-TTg
Mar 2008	Avian and pandemic national strategy approved	
Jul 2008	Law of communicable diseases prevention and control	Effective since 1st Jul 2008 3 decrees and decisions of Prime Minister 17 circulars of MOH
2009	National Plan of Action for human influenza pandemic control in Vietnam	Decision No. 38/2005/QD-BYT Amended and supplemented in 2009
Jun 2009	Plan of Action for the Control of Influenza A(H1N1) Pandemic in Vietnam	Decision No. 2088/QD-BYT
Jul 2009	Prime Minister delegating the People's Committees of all levels to implement the task of communicable diseases prevention and control	Official Telegram No. 1245/CD-TTg

Achievements in the Agriculture Sector

A summary of major achievements for the five activities under the OPI for the Agriculture Sector is provided below.

- **Strengthening of veterinary services**: Veterinary services have been strengthened significantly and improvements have been documented through the OIE PVS assessments conducted in 2006 and 2010. Veterinary laboratories have improved quality management systems and equipment. Both field and laboratory officers have received training.
- **Disease control**: Improvements in response to the disease have been made through training in emergency disease management and mock outbreak exercises. Vaccination programs have been reviewed annually to improve targeting of vaccination.
- **Surveillance and epidemiological investigations**: Additional training has been provided in field epidemiology. Active surveillance programs have been

expanded to markets and slaughterhouses and other potentially high risk places. Passive surveillance systems have been improved through training of commune-based animal health workers. Post vaccination monitoring programs have been expanded.

- **Restructuring of the poultry industry**: Selected markets and slaughterhouses have been upgraded, and improvements in farm biosecurity for poultry farms have been achieved. Staff from the Department of Livestock Production have received post graduate training and there has been broader strengthening of DLP through international technical assistance and provision of extension and management equipment.
- **Public awareness and behavioural change**: Major campaigns forming part of the coordinated national communications program have been undertaken to improve awareness of the main risk factors and key preventive measures.

Achievements in the Human Health Sector

A summary of the major achievements for the core areas of activity for the human health sector during 2006-2010 include:

- **Surveillance and response**: Guidelines and training on surveillance standards and specimen collection and transportation have been delivered to over 3,000 provincial and district staff; communicable disease surveillance software to link communes to the central level has been developed and tested; 800 rapid response teams have been trained; 50 province level simulation exercises have been conducted; and public health laboratories have been upgraded.
- **Curative health sector:** Thousands of central and provincial medical and nursing staff have been trained with the newly developed guidelines for the diagnosis and treatment of influenza; medical equipment has been supplied to provincial and district hospitals to allow for the transportation and management of patients with severe respiratory conditions; and selected hospital isolation units have been upgraded to improve hospital infection control standards.
- **Preventive health sector**: The structural, legal and operational framework for communicable disease control has been considerably strengthened with the passing of the Law of communicable diseases prevention and control, improvements in inter-ministerial coordination and revision of the national action plan for a human influenza pandemic. There has been heavy investment in strengthening the capacity of local preventive medicine department personnel through post-graduate education and short course training: almost 7,000 health workers were trained during 2006-2010 and the FETP has been successfully established.
- **Communications and behaviour change:** Communications plans to inform the general public and health personnel of requirements during different pandemic phases have been established. Systems are now in place to update decision makers in the Party and the Government on domestic and international communicable disease threats and to enlist the support of agencies, unions and security forces. Behaviour change communications programs targeted at people involved in poultry production have been conducted.

- **Research:** A range of hospitals and institutes are now coordinating research on HPAI and pandemic influenza including NIHE, Pasteur Institutes, Hospitals of Tropical Diseases, the National Paediatric Hospital and the Institute of Vaccines and Bioproducts. Research has focused on virology, epidemiology, control measures and vaccine development.

LESSONS LEARNED, 2006-2010

Many important lessons have been learned in Vietnam in the past 5 years as a result of experiences dealing with avian and H1N1 pandemic influenza. Formal reviews of programs conducted since 2006 and recent reflections by MOH and MARD on the local experience of responding to H5N1 HPAI and influenza A/H1N1 provide a number of important lessons for the design of the national plan for 2011-2015, which are summarized here. Additional detail on these lessons is provided at Annex I.

General lessons learned including lessons on coordination

- Political commitment and leadership have been essential in progressively addressing HPAI and in rapidly preparing Vietnam for a pandemic.
- Donor support and coordination for the Vietnam response to HPAI, pandemic influenza and other EIDs remains critical alongside ongoing resources from the Government of Vietnam.
- A number of system constraints have been exposed by the emergence of HPAI and H1N1 and warrant careful consideration for improvements in the system to ensure effective collaborations between human and animal health sectors.
- Effective collaborations - which may consist of formal linkages with other national coordination and regulatory authorities - need to also be expanded to include other relevant sectors such as environment, wildlife, and essential services (energy, telecommunications, finance and banking, law and public security, public utilities, transportation.
- Early recognition and response to new emerging infectious diseases are crucial to reduce the risk of these diseases becoming widespread.
- Timeliness of international reporting of notifiable human and animal health events is a key feature of a successful national response.
- Vietnam and neighbouring countries remain at risk of introduction of new strains of H5N1 HPAI virus, requiring a regional approach.
- Avian influenza caused by viruses of the H5N1 subtype is not expected to be eliminated from Vietnam in the next five years.
- The linked system of national steering committees should be reviewed and their scope expanded to address other emerging diseases in humans and animals.
- The Partnership on Avian and Human Influenza (PAHI) has proved an effective bridge between national and international partners.

Lessons learned in the animal health sector

- It will be a number of years before veterinary services (public and private) achieve international quality standards in all areas.
- Demand will increase for high quality veterinary and animal production services to support the expanding livestock sector and to control and prevent important diseases.
- Livestock disease control and prevention is a shared responsibility between government and the private sector.
- Increased demand for livestock products by consumers will result in an increase movement of livestock and livestock products across land borders.
- The focus on avian influenza during the previous period has to some extent come at the expense of work on other important diseases of animals.
- Zonal approaches to avian influenza control based on agro-ecological conditions have been promoted and used successfully (such as differences in vaccination policy) given the marked differences in agro-ecology between parts of the country and demonstrated by the restricted crossover of viruses between the north and south of the country.
- Improved surveillance, disease investigations and genetic analysis of viruses are essential to understand the relationships between different virus isolates and the epidemiology of the disease.
- Environmental and other costs of livestock production, especially large industrialised units, need to be considered and the effects mitigated.
- Industrialised poultry farms will pose a different set of public health threats to those from small farms.
- The drivers of livestock sector development must be understood and expansion planned and regulated properly to prevent emergence of new problems or re-emergence of existing diseases and environmental hazards.
- The risk for emergence of infectious disease sourced from wildlife species has been recognised, however functions and responsibilities of state management agencies need further clarification and the capacity of veterinary services on investigate and respond to diseases in wildlife and other related sectors needs to be developed.

Lessons learned in the Human Health sector

- Professional leadership across all departments of the health sector has been a key enabler in the success of developing and implementing national plans and in advancing legislation to improve prevention and control of communicable diseases.
- From provinces down, lower levels of the health system require further strengthening.

- Issues of staff recruitment, retention and training limit the capacity of the preventive medicine system.
- The capacity to respond to large-scale events and multiple, simultaneous public health threats would be improved with further integration of parallel systems for addressing natural disasters and pandemics at provincial levels and below.
- Simulation exercises have proved important in mobilising authorities, the health sector and communities.
- Pandemic preparedness planning within (and beyond) the health sector has focused on health issues with operational continuity aspects yet to be strengthened and tested
- Evaluation of efforts across the full range of responses is required to assess effectiveness and improve future planning.
- A culture of reflection after action - documenting what worked and what didn't work - should be promoted at all levels of the health system so that health managers have the necessary information to improve planning, preparedness, response and mitigation measures.
- Flexibility is needed in responses to HPAI, pandemic influenza and emerging infectious diseases.

Lessons learned relevant to both animal and human health sectors

- Human health is connected to the health of animals and to the health of ecosystems. These interdependencies underscore the need to apply a One Health approach that harmonises human health and animal health systems to improve communicable disease control particularly for HPAI, SARS and other potential zoonoses, and for unknown future threats.
- The animal and human health sectors will need to collaborate to address a number of key changes affecting Vietnam in the near future, including demographic changes, food safety and security and climate change.

Lessons learned relevant to communications and behavioural change

- The national avian influenza and emerging diseases plan must be clearly and carefully communicated to all stakeholders so that all parties are fully committed to its coordinated implementation.
- The mobilization and participation of the whole of government, social and civil society organizations, the mass media and the whole of society at all levels with technical guidance of the agriculture and health sectors was a key factor in the success of public awareness-raising and communication activities particularly during high-risk periods.
- Risk communication messages from government to the public during outbreaks can be partly designed and tested in advance to ensure rapid implementation when required.

- Communication with the public is a key prevention and control strategy for all emerging diseases.
- Knowledge of disease can be improved through IEC campaigns but behavioural change is more difficult to achieve especially if the public sees little reason or incentive to change long-standing behaviours and practices.
- A number of human cases of influenza A(H5N1) in Vietnam and elsewhere still appear to result from handling and consuming of sick and dead poultry.
- Changes to the poultry vaccination strategies will potentially leave a considerable number of susceptible poultry in household flocks.
- Specific extension programs need to be designed and implemented to support changes to market and slaughterhouse practices.

POLICY FRAMEWORK AND GOVERNMENT INTERVENTIONS

Animal health policy. As described in the OPI 2006-2010, the agriculture sector's policy framework has shifted from a short-term emergency response to a longer-term agenda (except in the event of disease outbreaks). The policy focuses on two key factors:

1. A policy framework for managing the expansion of the poultry/livestock sector; and

2. A policy framework for improving the capacity of veterinary and animal production services that support the livestock sector.

The policy focus will be on strengthening support services including improvements in surveillance, epidemiology and operational capacity for avian influenza and other important emerging and re-emerging pathogens. Institutionalizing coordination between animal health, animal production and human health workers will be promoted as will links between those involved in livestock production in the public and private sector.

Measures adopted by MARD for avian influenza include deployment of conventional control and preventive measures of culling (with compensation), movement controls, cleaning and disinfection, and other improvements to biosecurity along production and market chains, combined with strategic vaccination of domestic poultry in places where it is needed. Other measures include raising public awareness/behavioural change campaigns, strengthening diagnostic capacity, enhancing research capability and carrying out epidemiological studies and disease investigations to understand the routes of transmission and to identify high-risk sites for virus persistence and spread. Some changes to the way poultry are produced, marketed and butchered are also being implemented aiming to minimize the risk of H5N1 infection.

Human health policy. The human health sector will continue to address the two policy directions outlined in the OPI 2006-2010:

1. A policy framework for addressing the risk of HPAI among people. Using classic public health measures the new program will go on reinforcing surveillance and response mechanisms for early detection and control of HPAI among people, promote behaviour change to minimize the risk of human infection, and support improvements in curative sector capacity to identify and care for infected patients including appropriately referring the sickest patients to higher-level facilities.

2. A policy framework for preparing for and responding to a human influenza pandemic. The influenza A/H1N1 pandemic of 2009 provided a live test of national pandemic plans. MOH policy is to review the effectiveness of preparatory and mitigation measures and adapt preventive and curative health care plans in light of the findings of the review. Significant investments are still required for the development of robust multi-sectoral plans from the central to commune level.

One Health approach: A new policy direction has been added to reflect a move to a more comprehensive, integrated approach to zoonotic disease threats. The application of a One Health approach recognizes that the health of humans, the health of animals (including livestock and wildlife), and the environmental health of ecosystems are inextricably linked. A One Health approach involves attention to human interaction with animals, and to the consequences of land use changes, which can affect the dynamics of human-animal interaction.

This policy aims to more completely understand the existing interface between wildlife, livestock and humans, for example in areas where wild species are commercially farmed and slaughtered for human consumption, or traded and sold throughout Vietnam. A risk assessment of this interface will identify areas with the potential for emergence and transmission of infectious diseases.

Building on and extending the achievements of the previous period in responding to avian influenza, the policy will bring together the human health, animal health, and environmental management (urban, rural and natural environment) sectors with the aim of averting the human, social, economic and environmental costs associated with the emergence of zoonotic diseases. More details on the application of a One Health approach are provided in Annex II.

B. OBJECTIVES OF THE AIPED, 2011-2015

The overarching objective of the integrated national operational program for 2011 to 2015 is to reduce the risk to humans and animals from avian influenza A(H5N1) and other emerging infectious diseases by:

- controlling infectious diseases at source and implementing appropriate measures to prevent disease emergence/re-emergence;
- detecting and responding rapidly and appropriately to cases of new and emerging high impact diseases in both animals and humans;
- enhancing preparations for the health and non-health consequences of any severe pandemic disease of humans.

Importantly, these objectives align with existing international and regional frameworks such as International Health Regulations (IHR 2005) and the latest iteration of the Asia-Pacific Strategy for Emerging Diseases (APSED 2010). This will ensure that activities under the program are relevant for developing domestic capacity to meet these obligations. Monitoring and evaluation indicators can also be drawn from these frameworks. In addition, the regular external review of Vietnam's progress on IHR and APSED will boost momentum for realising the objectives of program and provide added value for continual improvement of activities listed in this document.

Summary of objectives from IHR, APSED and the OPI 2006-2010

IHR (2005)	APSED (2010)	OPI (2006-10)
• Designate a National IHR Focal Point • Develop, strengthen and maintain the surveillance and response capacity to detect, assess, notify, report and respond to public health events • Control urgent national public health risks that threaten to transmit diseases to other Member States • Provide routine inspection and control activities at international airports, ports and some ground crossings to prevent international disease transmission • Collaborate with other States Parties and with WHO in implementing the IHR	• Reduce the risk of emerging diseases • Strengthen early detection of outbreaks of emerging diseases and public health emergencies • Strengthen rapid response to emerging diseases and public health emergencies • Strengthen effective preparedness for emerging diseases and public health emergencies • Build sustainable technical collaboration and partnership in the Asia Pacific region	• *Reduce the risk of a pandemic occurring* • *Minimize incidence & mortality of human avian influenza infections* • *To take other steps necessary to reduce the impact of a human pandemic influenza* • *Link activities for HPAI to capacity of health sector to respond to emerging infectious diseases*

The objectives also align with the FAO/OIE Global Strategy for avian influenza which states:

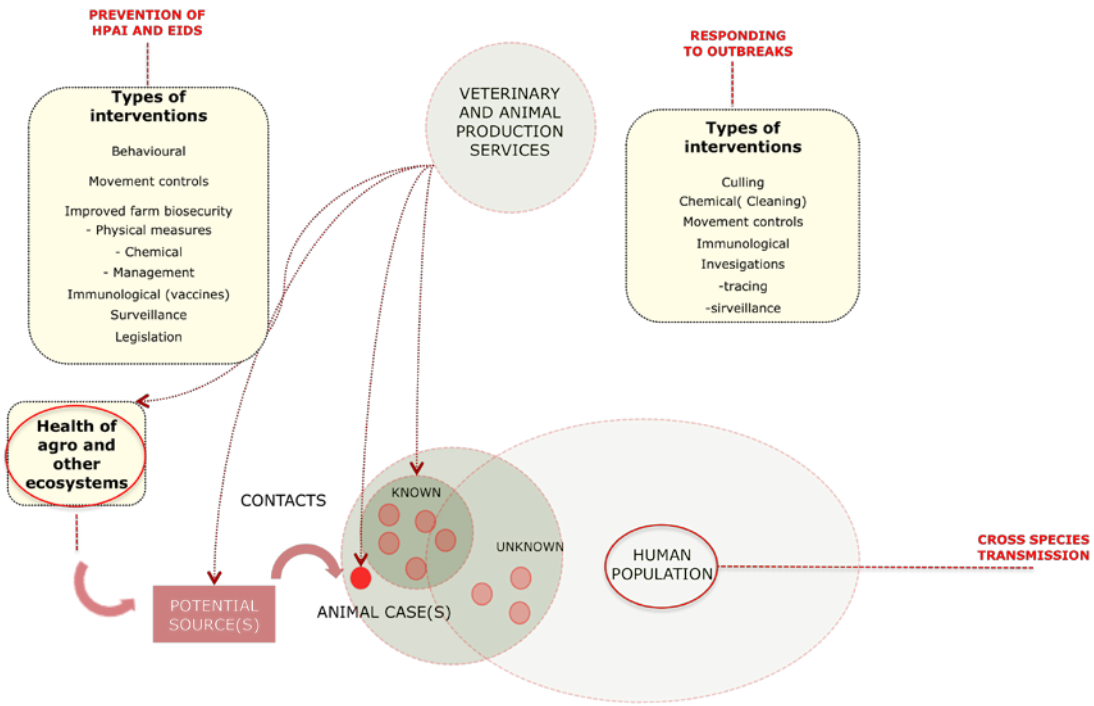
> "*Elimination of infection from countries with endemic infection in poultry will require many years of consistent engagement and support. A medium- to long-term approach (rather than just an emergency response), is needed to contain HPAI in these countries and subregions.*

This requires:

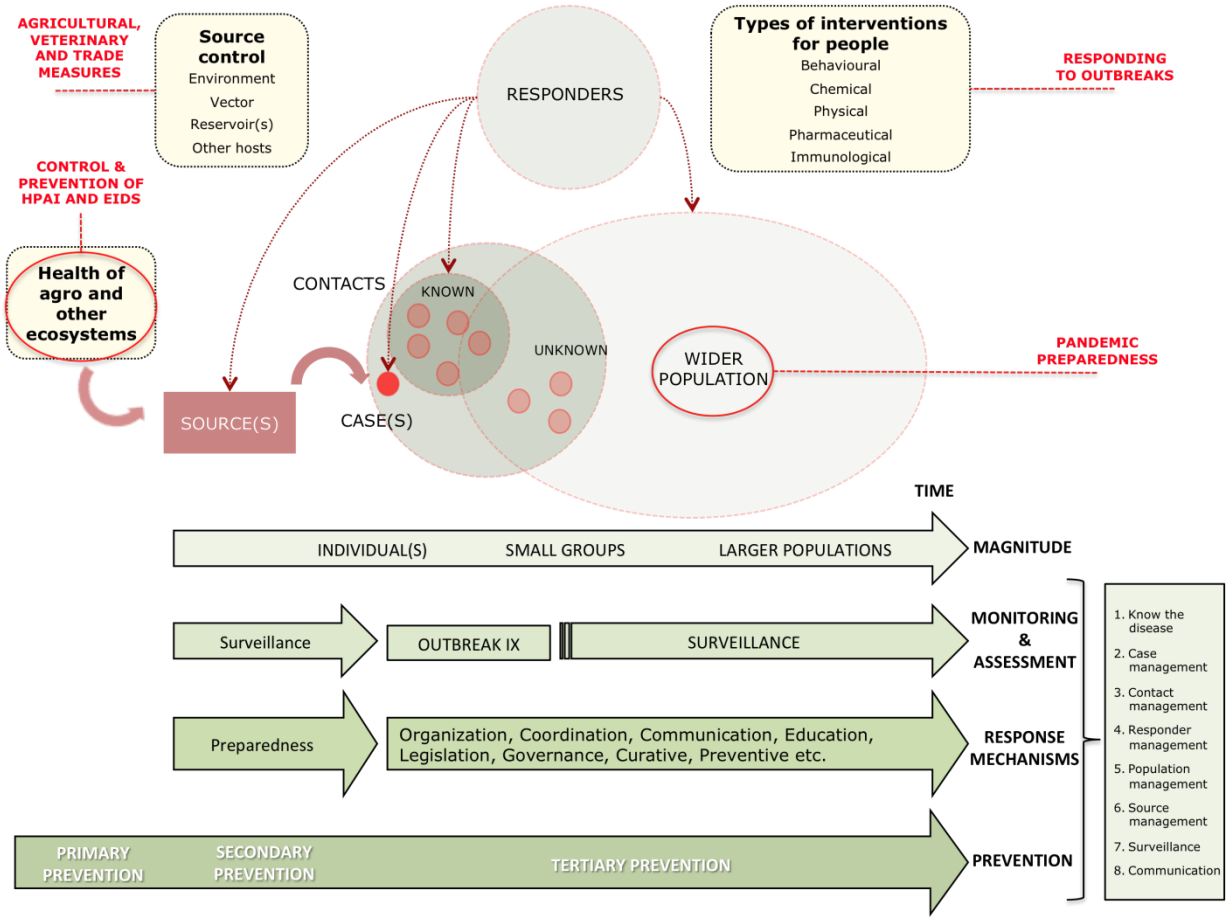
- *the continued building of capacities in key institutions, including better functioning veterinary services with the necessary powers to implement essential control measures and regulations;*
- *sustainable adjustments to the poultry sector to reduce the risks of disease and infection in settings where commercial poultry production and marketing practices carry high risks of HPAI;*
- *effective engagement of private-sector stakeholders (including industrial poultry producers) in these risk reduction efforts;*
- *sustained political commitment, from the highest level of government, reflected in provision of an appropriate resource allocation and enforceable regulations; and*
- *the application of appropriate, interim control measures, including vaccination, to contain infection.*

A comprehensive approach to the prevention, response and mitigation of communicable diseases

i) Animal populations



ii) Human health



The AIPED plan for the period 2011-2015 has been designed with reference to the overall National Five-Year Socio-Economic Development Plan, 2011-2015, the national sectoral plans for the animal health and livestock production sectors, the health sector and other related sectors for the same period, and key sectoral strategies, programs and projects including the Livestock Competitiveness and Food Safety Project (LIFSAP), the national plan for strengthening the capacity of veterinary services developed based on cooperation with OIE, and other relevant national initiatives.

C. DESCRIPTION OF THE PROGRAM

Component I - Enhanced Coordination Activities

Activities to be funded under Component I of this plan will support (a) strengthening overall coordination mechanisms for avian influenza and other potentially serious disease threats in animals and humans; (b) international cooperation and donor coordination; (c) public awareness raising and behaviour change communications; (d) monitoring and evaluation of the plan; and (e) regional and international coordination activities.

NATIONAL COORDINATION MECHANISMS

The National Steering Committee for Avian Influenza (NSCAI) was established by the Prime Minister in January 2004 (Decision No13/2004/QD-TTg 28/1/2004) as the national coordination mechanism for HPAI planning and supervision. The Minister of MARD chairs the committee, and the Vice Ministers of both MARD and MOH are vice chairs. Members include representatives from the Ministries of Finance, Trade, Public security, Transport, Natural Resources and Environment, Culture and Information, and Foreign affairs. The PAHI Secretariat is also present at NSCAI meetings. The tasks of the NSCAI are:

- To develop the plan for coordination of activities of ministries and sectors for the prevention and control of HPAI;
- To organize the implementation and provide supervision to ministries, sectors and localities implementing the emergency plan for prevention and control of avian influenza.

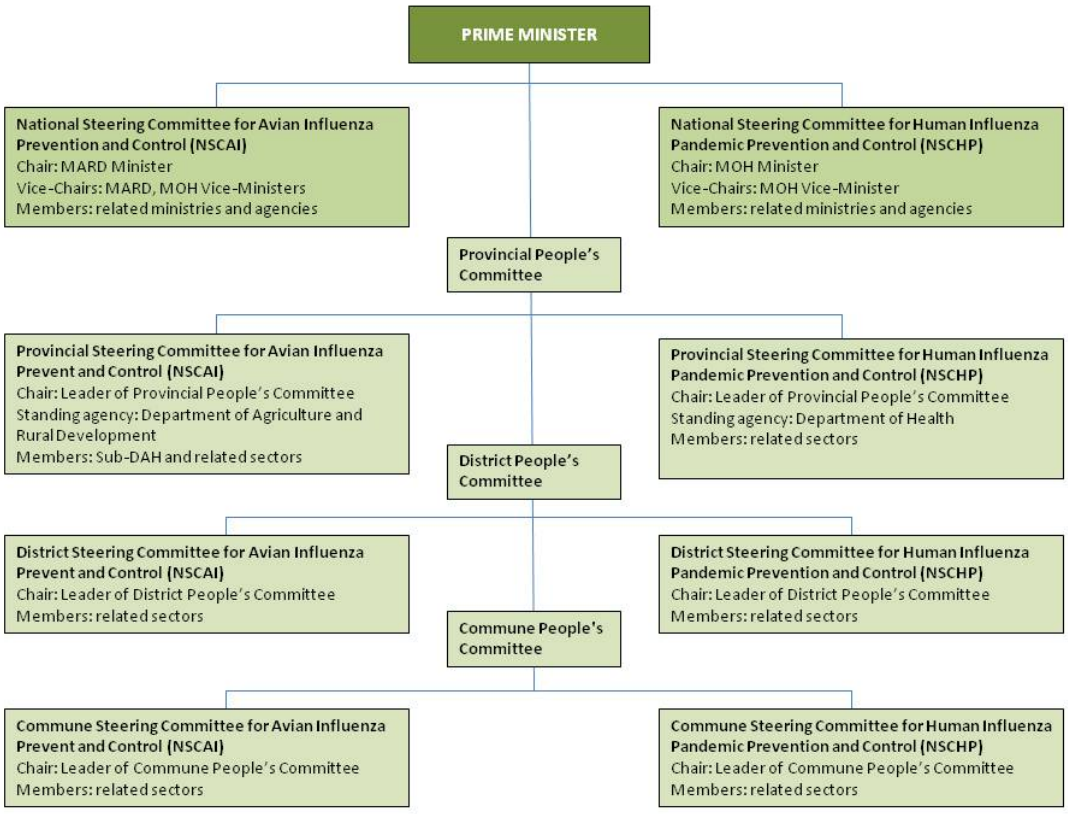
The National Steering Committee for Human Influenza Pandemic Prevention and Control (NSCHP) evolved from the National SARS Steering Committee as per Prime Minister Decision No. 348/2006/QD-TTg 21/2/2006. The Minister of Health chairs the committee. The members of the NSCHP include the Vice Minister of Health, the Director of National Institute of Hygiene and Epidemiology (NIHE), the Vice Ministers of the ministries of foreign affairs, defence, public security, planning and investment, finance, science and technology, agriculture and rural development, transportation, culture and information, labour, invalids and social affairs, and natural resources and environment, the Director of Viet Nam Administration of Tourism, the Representative from Government Cabinet office, and the Vietnam Red Cross (VNRC). The PAHI Secretariat is also present at NSCHP meetings. There are four sub-committees to provide specialist advice on communications, pandemic surveillance and control, medical treatment and logistics. The NSCHP has the specific responsibility:

- To develop national pandemic plans and a budget for the implementation and maintenance of these plans;
- To organize and monitor implementation of the plan.

Similar steering committees exist in all provinces and at lower levels under the People's Committees with the leader of the Peoples' Committee responsible for directing epidemic prevention and control at local levels.

In applying a One Health approach, membership of these mechanisms will be reviewed to ensure the inclusion of wildlife management agencies and other relevant partners for a comprehensive integrated response.

Figure: National coordination structure for HPAI and pandemic influenza



Strengthening coordination at all levels

The twin structures of the NSCAI and the NSCHP, and related mechanisms at provincial and lower levels, have been effective in organising a rapid, early response to the specific threats posed by HPAI and pandemic influenza. The effectiveness in these structures can also be seen in the way in which they have been rapidly applied in practice to other emerging animal and human diseases (for example, the role of the NSCAI in coordinating the national response to FMD and PRRS in livestock, and the role of the NSCHP in coordinating the response to pandemic (H1N1) 2009).

National coordination structures such as the steering committees and sub-national structures need review particularly in regard to the performance of these mechanisms during the 2009 pandemic and with changes in the strategy to address HPAI. The effective collaboration between the health sector, the animal health and livestock

production sectors and other related sectors in responding to HPAI and pandemic influenza should be consolidated and further strengthened.

It will also be important to explore how responsibilities for a broader range of emerging diseases applying a One Health approach might be shared under the current structure and how multi-sectoral inputs to deal with diseases at source will be incorporated. Review of the membership of different coordination mechanisms is needed for applying a One Health approach, including identifying the roles and participation of related management agencies responsible for wildlife and environmental health, for example through the inclusion of the Forest Directorate within MARD and related branches at all levels responsible for commercial wildlife farm management.

Consideration should also be given to environmental health and the roles and responsibilities of state management agencies for agricultural and other eco-systems. While the costs of coordination, monitoring and mitigation actions may act as a deterrent to comprehensively integrating ecosystems health as part of a One Health approach, the potential long-term costs of inaction may be significantly higher still. It will be important to conduct further study on the potential costs and benefits of different approaches as part of the development of a One Health approach, drawing from the ongoing international development of One Health concepts and their application at the country level.

Consideration should also be given to ecological areas of the country how these relate to administrative structures and management significant public health events, noting that the Agriculture and Health sectors and the public health laboratory network all currently divide the country according to different administrative boundaries.

The IHR calls for a multi-hazard National Public Health Emergency Preparedness and Response Plan. The current national structure has separate agencies at the central level assigned responsibility for specific types of natural disasters (particularly for flood and storm control) and for pandemic influenza (or other serious infectious disease threats). Different types of disasters may have different technical and policy implications and during the past decade there has been a need in the crisis phase of SARS, H5N1 and H1N1 to rapidly develop capacity within the health sector. Alignment of the natural disaster management (mainly floods) and pandemic influenza response structures should be considered where relevant.

Further attention is needed to the role of non-health sectors in pandemic preparedness and coordination mechanisms. To date, there has been only limited pandemic planning undertaken by non-health sectors. The health sector cannot develop plans for other sectors, but it can stimulate action to ensure a coordinated government response in the event of a pandemic. This is particularly important with regard to maintenance of essential services including services required to keep health facilities functioning.

Support to Central and Provincial Coordination. Overall coordination for the 2011-2015 will be carried out by MARD and MOH through the NSCAI, with MOH also responsible to ensure effective coordination and linkages with complementary activities under the responsibility of the NSCHP. The provincial and lower levels will apply similar coordination mechanisms. Overall inter-sectoral coordination structures in Vietnam at

the central and local levels have been designed to function without a specific budget allocation for ongoing operational costs, with activities carried out by each sector utilising available national and project funding, and overall support for steering committee activities provided by the standing ministry or agency in each case.

Noting the need to consolidate and further enhance inter-sectoral coordination and alignment between the agriculture and health sectors during the coming period, a key activity will be the finalization, adoption and implementation of a joint ministerial circular that is currently under development by MARD and MOH. This is expected to create a sustainable legal and institutional basis for information-sharing and joint surveillance and response activities.

INTERNATIONAL COOPERATION AND DONOR CORDINATION

The NSCAI was effectively entrusted with responsibility for government-donor coordination. Building on a series of government-donor coordination meetings since early 2004 and the collaborative development of the OPI by national and international partners, the **Partnership on Avian and Human Influenza (PAHI)** was established in November 2006 in line with the plan outlined in the OPI.

Twenty-six partners signed the PAHI Partnership Framework for the OPI, including the Government of Vietnam (represented by the Minister of Agriculture as Chair of the NSCAI) as well as other national organizations, the UN System, the World Bank, international donors, NGOs, research organizations and other stakeholders.

List of Signatories to the PAHI Partnership Framework for the OPI

Government of Vietnam	*UN System & Multilateral Donors*	*Bilateral Donors*	*Non-Government, Research & Private Sector organizations*
1. MARD Minister on behalf of the National Steering Committee on Avian Influenza (NSCAI)	2. Asian Development Bank 3. European Commission 4. United Nations System 5. FAO 6. UNDP 7. UNICEF 8. WHO 9. The World Bank	10. Embassy of Australia 11. Embassy of Canada 12. Embassy of China 13. Embassy of Denmark 14. Embassy of Finland 15. Embassy of Japan 16. Embassy of New Zealand 17. Embassy of the United States of America	18. Abt Associates 19. Academy for Educational Development (AED) 20. Care International 21. Catholic Relief Services 22. CIRAD 23. International Federation of Red Cross and Red Crescent Societies (IFRC) 24. Plan in Vietnam 25. Vietnam Red Cross (VNRC) 26. Vietnam Veterinary Association

The Partnership has been supported by a Secretariat located within the MARD under joint overall supervision by MARD and MOH. Operational funding for the partnership has been channelled to MARD International Cooperation Department through the Government-UN Joint Programme on Avian Influenza. This support includes the costs of project staff (Secretariat Manager, Information Officer, Accountant and Secretariat) as well as an international advisor. Other support has been provided either directly or in-kind by the World Bank-administered VAHIP, USAID and Care Vietnam.

Annual Plenary meetings of the Partnership have provided a forum for updating the disease situation, joint monitoring of overall financial commitments and delivery, policy discussions and sharing of experiences. Other activities of the Partnership have included support to information sharing via the PAHI website and preparation of the newsletter, as well as reporting on the contents of meetings of the NSCAI and the NSCHP. Various meetings have also been organized to review progress on specific sectors and aspects, and for technical and policy exchanges.

In additional to financial monitoring, the PAHI Secretariat supported the development of the National AHI Monitoring Framework for the OPI, and facilitated the overall mid-term review of the OPI in 2009. The PAHI Secretariat also provided support to the planning and organization of IMCAPI Hanoi 2010.

The Avian Influenza Behaviour Change Working Group has met under the umbrella of the Partnership. This Working Group developed the National Strategic Framework for AHI Behaviour Change Communications. The Biosecurity Working Group chaired by DLP also provides a coordination mechanism related to the overall objectives of the Partnership.

Strengthening ODA coordination

The *Hanoi Declaration* (Annex VI) made at the International Ministerial Conference on animal and pandemic influenza (April 2010) made clear the need for ongoing international cooperation to address avian influenza as well as national cross-sectoral coordination to maintain and strengthen preparedness for pandemic influenza and other emerging infectious disease threats:

> *"The global experience with H5N1 HPAI and pandemic (H1N1) 2009 has reaffirmed the importance of international and regional cooperation, national political commitment, inter-sectoral collaboration, timely and transparent communication, and capacity building as essential to build a health system which is capable to address emerging threats, such as animal and human influenza, and to ensure effective pandemic readiness and response across different sectors."*

This plan forms the basis for mobilization and utilization of both national and ODA resources, including grants and loans, during the period 2011-2015.

The *Hanoi Core Statement* (June 2005) remains relevant for all government-donor partnerships in Vietnam (see table below).

HANOI CORE STATEMENT		
1	OWNERSHIP	The GoV defines operational development policies
2	ALIGNMENT	Donors align with GoV strategies and commit to use strengthened country systems
		Vietnam strengthens institutional capacity with support from donors
		Donors increasingly use government systems
3	HARMONIZATION AND SIMPLIFICATION	Donors implement common arrangements and simplify procedures
		Complementarity: more effective division of labour
		Incentives for collaborative behaviour
4	MANAGING FOR RESULTS	Managing resources and improving decision-making for results
5	MUTUAL ACCOUNTABILITY	GoV and donors are accountable for development results

Both the NSCAI and key international partners have affirmed the value of continuing the PAHI Partnership to support overall coordination of the new plan for the period 2011-2015. The design of the Partnership for the coming period will be based on further consultations with key national and international partners and should take into account the expanded scope of this plan compared to the OPI, as well as any changes to the overall national coordination mechanisms described above.

A key activity of the national agencies working with the Partnership and its Secretariat during the coming period will be to mobilize financial and technical resources for implementation of AIPED 2011-2015. With the expectation of a reduced number of active international partners compared to the previous period, as well as the availability of results of several pilot and applied research activities, the activities of the Partnership should include a more focused and intensive process of policy and technical discussions.

The National agencies as well as the Partnership and its Secretariat should also focus on identifying related areas of work for enhanced coordination, linkages and

mainstreaming, including: food safety, livestock development, sanitation and hygiene promotion, preparedness for complex disasters, climate change adaptation and other relevant areas. Information-sharing and exchange should be established with national authorities and key programs and projects working in these areas.

As the Government-UN Joint Programme on Avian Influenza will come to an end in December 2011, new funding will be need to be indentified from existing or new donors to support the operational costs and activities of the Partnership and its Secretariat.

Strengthening engagement with civil society and the private sector.

The OPI emphasized the need for engagement with representatives from the scientific research community as well as civil society more generally, such as large INGOs, mass organizations and representatives from the business sector, including animal feed processors, manufacturers and suppliers of laboratory equipment, drugs and vaccines. Some of these groups subsequently became signatories to the Partnership Framework, as indicated above, and have participated in PAHI meetings and other events and networks. However, as indicated in the Mid-Term Review of the OPI, further engagement with private sector representatives in particular would be important in the coming period. In addition to those noted in the OPI, other key private sector stakeholders in achieving the objectives of this plan include private health care workers, the commercial health sector, and private veterinary service providers.

COMMUNICATIONS, PUBLIC AWARENESS AND BEHAVIOURAL CHANGE

Timely communication of accurate information to the public, the media, health workers, and decision makers within health and other government ministries is a core operational objective. This applies for *health emergency communications* during a pandemic or the emergence of a new infectious disease, *behaviour change communications* that are of particular relevance in addressing HPAI and other diseases in animals, including wildlife, and their risk to humans, and *operations communications* to ensure the smooth working of multiple organisations in responding to threats.

During the previous five-year period, the response to avian and pandemic influenza has moved from a primary focus on public awareness raising to implementing behaviour change communications and assessing which approaches and models are most successful in Vietnam. The AHI Behaviour Change Working Group contributed to the development of the National Strategic Framework for Avian and Human Influenza Communications (2008-2010), which was promulgated by the MARD Minister and Chair of the NSCAI under Decision No. 2055/QD-BNN-HTQT dated 9th July 2008. The Strategic Framework analyzes communication priorities for key target groups in the agriculture and health sectors in terms of technical validity and practical feasibility for adoption. Identified target groups and overall national communication priorities established in the Framework for the two sectors under non-outbreak and outbreak situations are listed in the following table.

Table: Identified target groups and overall national communication priorities from the National Strategic Framework for Avian and Human Influenza Communications, 2008-2010.

Sector and list of key target groups	Overall priorities for behaviour change	
	Non-Outbreak Situation	Outbreak Situation
Agriculture Sector *Target groups: animal health workers, small-scale poultry producers/workers, poultry slaughterers and butchers, traders and vendors, urban producers/ traders*	Poultry raisers actively comply with official poultry vaccination schedules. Regularly clean poultry raising areas (yards and pens). Clean vehicles, boots, cages, containers and other equipment after visiting wet markets or raising farms and before returning to the farms. Immediately report sick or dead poultry to veterinary officials and local authorities.	Immediately report sick or dead poultry to veterinary officials and local authorities. Culling and disposal of sick and dead poultry is carried out under supervision of local authorities and PPE is used. Poultry and poultry products are not moved from areas with active disease for 21 days. Restocking of poultry is delayed for at least 1 month after an outbreak.
Health Sector *Target groups: human health workers, poultry farmers and other bird raisers, slaughterers, buyers and sellers, persons preparing and cooking food, people eating poultry, children, everybody*	Not buy or sell poultry that has been sick or dead. Not slaughter or eat poultry that has been sick (or died of a sickness). Eat only thoroughly cooked poultry and poultry products (no pink meat or runny eggs). Avoid contact with sick and dead poultry. Wash hands with clean water and soap after contacting with poultry and before eating. Immediately report sick or dead poultry to veterinary officials and local authorities.	People with fever >38°C have to go to their local health station for evaluation, especially if there is sick or dead poultry in the surrounding environment. Immediately report sick or dead poultry to veterinary officials and local authorities. Not buy or sell poultry that has been sick or dead. Not slaughter or eat poultry that has been sick (or died of a sickness). Avoid contact with sick and dead poultry. Wash hands with clean water and soap after contacting with poultry and before eating.

The target groups and priorities for behaviour change in the Strategic Framework remain basically valid; however they will need to be reviewed as part of the development of a new detailed communications strategy to be developed in the first year in support of the plan for 2011-2015.

The new strategy will need to take account of the following key aspects:

- The current context of low risk perception and competition of other important issues amongst key target groups including authorities at different levels, health care workers, poultry sector workers, the media and the general public and the need to identify an effective rationale and incentives for target groups to change their behaviours.
- The ongoing development of technical knowledge based on scientific research,

evidence and risk analysis regarding influenza strains and other viruses circulating in Vietnam or other countries. A risk communication approach should be applied.

- The availability of tested models and approaches for different types of communications at the community level, with the media and with other stakeholders that can be considered for replication and scaling up within the animal health and livestock production sectors, the health sector and other relevant sectors.
- The results of detailed reviews and evaluations of the effectiveness of different types of communication activities, including identifying strengths and weaknesses, overall progress and remaining tasks, as well as detailed reviews carried out at the local level in order to build a 'bottom-up' planning approach.
- The need to ensure that public health communications, agricultural extension and other supportive communications are planned, resourced and carried out in step with changes in the agricultural sector's control plans, particularly for changes to poultry vaccination that may alter the risk to human populations and that require the awareness and cooperation of different groups within the population.
- Integration of health messages and risk communications for avian and pandemic influenza into other national programs and development activities, particularly as the national and international focus and resources shift to other health priorities. Some specific opportunities for mainstreaming and integration of behaviour change communications in the coming period include food safety and hygiene promotion activities such as the Vietnam Handwashing Initiative and food safety communication initiatives of MOH and the Livestock Competitiveness and Food Safety Project (LIFSAP) of MARD.
- Application of lessons from global and national reviews of the role of communications in the response to Pandemic (H1N1) 2009, as a basis for revising and maintaining overall preparedness plans for influenza or other human pandemics. For instance, public perception of social distancing measures and views on risk messages are important to refine pandemic communications. The role of communications in applying a One Health approach to preventing, preparing for and responding to avian influenza and other EIDs, including consideration of the need to involve of a wider group of actors and sectors, potentially including health, agriculture, economic development, trade, industry, commerce, population, immigration, law enforcement, social services and justice and many more. A common language will need to be developed so that all actors can readily communicate on an approach that is currently unfamiliar to most stakeholders.
- Consideration of how the prevention and control of high-risk emerging infectious diseases can effectively be 'socialized' through the involvement of a wide set of stakeholders at different levels, including mass organizations, commercial and professional associations, and social and civil groups.
- Continuing to strengthen coordination with media to maintain reliable mechanisms and capacity for timely, accurate dissemination of information to the general public.

The AHI Behaviour Change Working Group will continue to operate under the PAHI Partnership to bring together national and international partners at the central level working on public awareness raising and behaviour change communications in support of implementation of the overall plan. Key activities of the Working Group during the coming period will include:

- Support to overall strategy development and coordination of communication activities under AIPED, including review of key messages to ensure these maintain technically sound, feasible and consistent.
- Sharing of information on plans and activities, experiences and lessons learned, and research results relevant to communications in support of AIPED.
- Joint development or sharing of communication approaches and materials, including access to national and international technical experts to review proposed materials prior to finalization.
- Joint overall monitoring of progress on communication activities.
- A resource for communication agencies within Vietnam and elsewhere through the database of communication materials maintained on the PAHI website with contributions from participating agencies in the Working Group.

Building on the strong relations established during the previous period, the Working Group will continue to cooperate closely with the Communication Subcommittee of the National Steering Committee on Human Influenza Pandemic Prevention and Control and its members, with DAH, DLP and NAEC within MARD and with other key national partners at the central level. The Working Group should also work closely with other working groups and networks, including particularly the Biosecurity Working Group coordinated by the Department of Livestock Production.

Consideration should also be given to involving key stakeholders from the commercial sector, such as associations of livestock producers and input suppliers, private health-care service providers, and others in the coordination mechanisms, design and implementation of the communications plan in support of AIPED.

As with the previous period, actual implementation of activities within the overall strategic framework for communications under the AIPED plan will be carried out under the leadership of each specific sector by individual agencies and projects.

PROGRAM MONITORING AND EVALUATION

Purpose. Monitoring and evaluation will measure the progress in implementing this plan and achieving impact in line with its overall objectives. This process will alert government decision makers to actual or potential problems in implementation so that adjustments can be made, help to determine whether the relevant stakeholders are responding as expected and intended, and provide a process whereby the coordinating and executing agencies can further improve the effectiveness of their activities. In addition, the monitoring and evaluation process will help inform all stakeholders and participants within civil society and the international donor community of the status and effectiveness of program implementation.

Responsibilities. The implementing agencies will be responsible for monitoring and evaluation for the program activities they undertake. Most importantly, MARD and MOH will be responsible for monitoring and evaluation of Parts II and III of the plan respectively. Monitoring and evaluation will be carried out by regular staff of these ministries, with technical assistance and, in some cases, contracting out of specific functions to specialized agencies and institutions where appropriate.

Overall monitoring and evaluation of the 2011-2015 will be carried out by the NSCAI, with the NSCHP playing a complementary role for pandemic preparedness and related aspects. Annual meetings of the Plenary will also provide a forum for overall monitoring and evaluating of progress in implementing the 2011-2015 plan. Building on the initial work done under the OPI and the proposed indicators, key milestones and pathways included in this plan, a practical monitoring and evaluation plan and schedule will be developed.

PAHI Secretariat will play a supporting role to facilitate and consolidate inputs from national and international agencies for overall monitoring and evaluation. Funding has been included in the budget for specific overall mid-term and final evaluations of the program, to be carried out by a joint team of national and international experts in line with the approach developed for the mid-term review of the OPI.

Further details on monitoring and evaluation are provided in Section E.

SUPPORT FOR REGIONAL AND INTERNATIONAL ACTIVITIES

Taking into account the global and regional nature of the challenges posed by animal and human emerging infectious diseases, Vietnam has paid great attention to regional and international cooperation during the implementation of the OPI. Vietnam participated actively in overall regional meetings and specific relevant working groups of ASEAN (including as the rotational chair in 2010) and APEC, a wide range of regional projects, and particularly as host of the International Ministerial Conference on Animal and Pandemic Influenza (IMCAPI) which took place in Hanoi in April 2010.

As a signatory to the International Health Regulations, Vietnam has worked closely with WHO on reporting of notifiable events. Vietnam has also participated in WHO's Global Influenza Surveillance program.

Vietnam is also a signatory to the OIE Animal Health Code, and has reported disease events in animals under this code. FAO is providing support to Vietnam through the regional Emergency Centre for Transboundary Animal Diseases (ECTAD) in Bangkok and the ECTAD team based in Vietnam. Vietnam has also participated in OIE's Performance, Vision and Strategy (PVS) review and capacity building program for veterinary services.

Vietnam has also worked closely with the office of the UN System Senior Influenza Coordinator (UNSIC) in Geneva and the regional UNSIC hub in Bangkok during OPI implementation. This cooperation has included provision of inputs to joint UNSIC-World Bank monitoring of progress on the global AHI response, as well as close

cooperation with UNSIC, the US Government and the EC as well as other international partners for the preparation and implementation of IMCAPI Hanoi 2010. Following the closure of the UNSIC regional hub in mid-2011, Vietnam will continue to work with regional UN System agencies and directly with UNSIC Geneva as appropriate.

Component II – HPAI control and eradication and strategy for emerging infectious diseases in the Agricultural Sector

A STRATEGIC APPROACH TO HPAI AND OTHER EMERGING DISEASES

HPAI Control, Prevention and Elimination Strategy

HPAI in the poultry population is being controlled progressively. As anticipated in the OPI for 2005-2010, Vietnam is currently in the ***Consolidation Phase,*** in which gains made so far in controlling and preventing the disease are being maintained, some modifications to the poultry industry are occurring, farms in the industrial sector are demonstrating freedom from HPAI, and disease-free compartments are being planned. The shift in emphasis away from short term emergency responses to longer-term strategies for disease prevention will continue, but readiness to respond to any animal health emergencies is still required and will be promoted.

It is expected that H5N1 HPAI viruses will not be eliminated from poultry in the next five years but the risk of infection for poultry and humans will be reduced.

Over the next five years Vietnam will build a better foundation for virus elimination as the number of verified disease-free compartments and areas increase, the number of farms with inadequate biosecurity measures decreases and better information on the disease is obtained. This will occur against a background of an expanding poultry sector.

A range of control and preventive measures will be applied in different parts of the poultry sector and in different agro-ecological zones.

Elements of HPAI control already in place will be strengthened, including early identification of infected poultry and disease outbreaks; active surveillance, outbreak investigation and epidemiological analysis; enhancements in biosecurity and other appropriate modifications to production, transport and marketing practices; and, movement controls covering farms, markets and borders.

Measures managed and directed by DAH, working with provincial (and lower level) veterinary services, will include rapid identification and response to disease outbreaks, targeted risk-based vaccination with variation between geographic areas and production sectors , enhanced management and control of movement of poultry and livestock , including better controls of movement across borders, and development of disease-free compartments that will eventually contribute to developing export markets. Better records of vaccination will be obtained from provincial authorities, including improved information on the target population for vaccination campaigns.

Stamping out is currently limited to farms and households where infected poultry are kept; this policy will be retained and will be supported by improvements to compensation mechanisms.

Vaccination is expected to remain a component of the control program within this 5-year period wherever and whenever the risk of infection with H5N1 HPAI remains high and other measures cannot be relied on to prevent infection. Vaccination will be used to help reduce the quantity of circulating virus. The application of vaccination will continue to be risk-based and, where possible, market driven, with reviews of the program, including the need for vaccination, conducted biennially or more regularly as needed. A greater focus on duck vaccination will continue as will a push for research into better poultry vaccines, which remain imperfect, especially in ducks. The long-term goal is cessation of vaccination. Once it is evident that the disease can be prevented and controlled effectively in certain populations of poultry using other methods, vaccination will be withdrawn from these poultry. For proper implementation, all of these measures require competent, well resourced veterinary and animal production services, from the community level to the central level.

Effective control also requires a better knowledge base built through improved surveillance, disease reporting and applied research into important aspects of the epidemiology of the disease, including understanding of risks associated with production and market chains.

During the next five years, new industrial poultry farms will be expected to meet clearly defined and rigorous biosecurity standards. Farms not meeting these requirements will, initially through market forces, be denied access to key market chains. Trade will increasingly involve processing of poultry through purpose-built slaughterhouses rather than live bird markets, especially in major urban areas.

Integrated industrial farms and associated facilities will form disease-free compartments.

Small non-biosecure chicken farms in the semi-industrialized sector will be encouraged to upgrade their facilities in a cost-effective manner. Farms that cannot upgrade (such as those rearing native chickens on an extensive basis) will be required to meet biosecurity standards appropriate to the production systems. Over time, market forces are expected to limit opportunities for sale of poultry to lucrative urban markets from those semi-industrialised farms that implement sub-standard biosecurity measures; communication activities can help to hasten these changes. Methods that have been used successfully to allow some native chickens, a niche product, to be sold in urban markets will be examined to assess feasibility of their wider application.

Remaining populations of grazing ducks will likely be subject to vaccination, movement restrictions and, where feasible, minimization of contact with other poultry. Where appropriate, upgrading to industrial production will be encouraged[6].

Although there will be a shift towards more intensive production and proportion of poultry reared in household flocks is expected to fall over the next 5 years, village households will continue to rear scavenging chickens as a vital source of income,

[6] However, in the face of diminishing livestock feed resources and increased costs of other inputs for crops such as herbicides and molluscicides, grazing duck production should be supported, provided the threat of avian influenza can be managed. Production of free-grazing ducks will be facilitated if better vaccines for ducks are available and the government will vigorously promote the need for development of better duck vaccines.

income diversity and protein through and beyond 2015. Plans are needed for the protection of poultry in this production sector, given that mass vaccination in this sector is not sustainable and will no longer be supported directly by the central government from 2011 onwards. Village- or commune- based measures, applied in some areas already, will be reviewed and successful models copied and promoted. Some protection of the scavenging chicken sector is likely to be afforded by effective control of infection in the commercial sectors and in grazing ducks, by reducing the levels of virus circulation. Wherever possible, holistic health plans will be promoted for scavenging chickens covering not only avian influenza but other important diseases.

Improved movement controls, especially for animals going to market, and traceability will be important components of disease prevention programs.

Applied research will continue, aimed at answering important questions about the transmission and survival of avian influenza viruses under local conditions and on appropriate methods of disease control and prevention. All international research programs on avian influenza in Vietnam will be expected to have links to local institutions and all relevant results will be provided in a standardised form to MARD on an annual basis. An annual review of relevant international and national research will be conducted and will feed into reviews of the control strategy.

All control and preventive measures will be implemented in a way that causes the least economic and social impact on the poor and minimizes environmental impacts. The potential impacts of proposed control measures will be assessed before implementation.

Closer cooperation and interaction between DLP and DAH and provincial authorities will be encouraged to ensure that a consistent approach to disease control and prevention is adopted. Cooperation and liaison with Health authorities at all levels will be maintained so that appropriate joint investigations can be conducted and to facilitate exchange of information. The measures implemented will not only be aimed at reducing the risk to poultry but also to minimise the risk to public health, including pandemic prevention.

Strategy for Emerging Diseases

Efforts will continue to contain and progressively control major transboundary disease through implementation of existing national disease control strategies for foot-and-mouth disease, classical swine fever and rabies. Wherever possible the activities in these individual programs will be linked.

Generic disease preventive measures including improvements to farm biosecurity, marketing and slaughtering practices will be promoted and in some cases regulated. The measures including minimising and (preferably) preventing contact between wildlife and livestock will be encouraged and in the case of large industrialised farms made mandatory. This will require close coordination between Animal Health, Livestock Protection and Forestry Directorate within MARD, and between equivalent sectors at sub-national levels, on registration and management of wildlife farming.

Trade patterns and contact patterns with wild animals will be studied, controls tightened on illegal trade and the diseases of and infectious agents carried by wild

animals will be better characterised through specific studies, focusing on species with the greatest likelihood of interaction with humans and domestic animals. Understanding of legal production systems for wildlife trade (including source, husbandry, trade routes and slaughtering systems) will also be enhanced.

Laboratory diagnostic capacity will be enhanced to allow detection of a range of pathogens that until recently have not been included in test profiles.

Close links will be forged between animal health and livestock production agencies and wildlife specialists and ecologists, and other ministries in Vietnam with responsibility for wildlife management, including MONRE.

Close monitoring of international and regional emerging disease events will continue as will cooperation with international agency programs aimed at monitoring and controlling emerging transboundary diseases. Cooperation with ASEAN and APEC in building regional disease control and prevention programs will also continue.

Significant ecological changes occurring in Vietnam, including those resulting from land use change (for example associated with extractive industries or large scale agriculture), should be monitored for potential effects on disease emergence and any new livestock planning zones need to be reviewed to assess the changes to the environment created in the zone that may increase the risk of disease emergence or other environmental damage.

STRENGTHENING OF VETERINARY AND ANIMAL PRODUCTION SERVICES

Veterinary and animal production capacities remain a key constraint to progressive disease control and elimination and for action on emerging infectious diseases. Further significant investment must be made in infrastructure, manpower and training if the gains made so far on avian influenza are to be consolidated.

Two OIE PVS reviews (2006 and 2010) and the PVS Gap Analysis have reaffirmed that Vietnam's veterinary services are still undergoing development and that it will be a number of years before the services meet the quality standards set by OIE for veterinary services. The following table lists the national priorities for livestock for the period to 2015 based on the Gap Analysis and strategy documents being developed by DAH and DLP. All of these require well-developed public and private veterinary services if they are to be implemented successfully.

Table: National DAH and DLP priorities for livestock for the period to 2015

Area	Priorities
ii) Animal production	• Increase animal production through intensification of the different animal production systems and through market chain improvement • Develop and gain export markets • Promote the application of GAHP for livestock production • Strengthen international cooperation on livestock production, especially on poultry production

ii) Animal health	• HPAI –progressive eradication • FMD –progressive control and eradication • Rabies - control • CSF control • PRRS control
iii) Public health	• Improve meat hygiene and inspection in major slaughterhouses to meet international standards, with supportive communication activities to increase demand for inspected meat. • Progressively reorganise slaughter slabs and improve inspection and hygiene • Sustain and increase monitoring plans for residue testing • Control the quality of veterinary biological and medicines and progressively regulate their distribution and use, especially antimicrobial drugs • Over time, include slaughter of wildlife in registered commercial production systems in the slaughterhouse system.

The OIE Gap Analysis proposes that strengthening of veterinary services to meet these goals will be achieved through three broad, cross cutting approaches over the next 5 years:

- Re-establish progressively the chain of command from the DAH to the field level in priority aspects of: Disease Control, Border Security, and Veterinary Public Health.
- Regulate veterinarians and veterinary para-professionals through a Veterinary Statutory Body including the harmonization of veterinary education to recognized international standards.
- Improve communications and consultation both within the veterinary services (including through improved data management) and with external stakeholders.

Plans are being developed by DAH to address these issues, including a 5-year plan for strengthening of veterinary services as part of the overall animal health strategy. Improvements to the chain of command for veterinary services will be addressed largely through improved cooperation and building of better networks.

Other specific goals that will be pursued include further strengthening of key areas relevant to disease control and prevention such as disease investigations and reporting, development of appropriate surveillance plans and improving understanding of surveillance results, and maintaining/improving laboratory quality management systems and laboratory capacity. Programs already in place to strengthen veterinary epidemiology such as the A-Vet program and the training of veterinary paraprofessionals will continue.

Public and private animal production services also need to be strengthened and this will be achieved over time through improvements to undergraduate and post graduate

education and training, through major livestock industry development projects such as LIFSAP and through on-the-job experience and training in areas such as spatial planning, implementation of biosecurity measures and waste control management. The Biosecurity Working group is expected to play a significant role in sharing information and lessons and coordinating different activities to improve capacity and will be one of the mechanisms for improving links between animal production and animal health staff.

Key activities for strengthening of veterinary and animal production services

A key activity that will be completed in the next 5 years and used as an indicator of success for this element is:

i) Introduction of a veterinary statutory body that will regulate professionals and paraprofessionals and professional/technical qualifications.

Detailed activities for this subcomponent are listed below. The activities have been divided into those that will be funded fully by the GoV and those that it will only be possible to impalement fully with the support from donors.

A. Veterinary services

An overall costed plan for delivery of veterinary services in Vietnam is being developed based, in part, on the OIE Gap Analysis conducted in 2010. The Gap Analysis suggested that a budget of $US35 million per annum is required for veterinary services over the next 5 years with additional 'one off' investments of $8 million.

A key focus area and indicator of progress for this activity will be standardisation of base qualifications for new veterinary paraprofessionals and a registration system for veterinarians and veterinary paraprofessionals through a veterinary statutory body (see below).

Central veterinary administration

Senior staff in DAH need to keep abreast of and share crucial information on animal health and emerging infectious diseases sub-nationally, nationally, regionally and internationally. The increase in the importance of emerging infectious diseases has increased demands for planning and budgeting for emergency disease control activities. It requires attendance at national, regional and international meetings with ASEAN, APEC, FAO, OIE and other organizations, and with other Ministries (especially the Ministry of Health) in Vietnam.

Appropriate links between central and local level veterinarians need to be strengthened and their responsibilities better defined. Field veterinarians at provincial, district and commune level are directed and supported by veterinarians in DAH at central and regional level who provide national guidance and directives, planning, professional support, data synthesis and analysis, policy development and support for rapid response capabilities.

The activities under the program for 2011-2015 for central veterinary services that will be funded by government include:

- Base salaries and allowances, local travel and office accommodation for senior staff
- Preparation of a consolidated plan for strengthening of veterinary services

Important activities for central administration that can only be implemented fully if additional funds are available from donors include:

- Development of a veterinary statutory body
- Attendance of senior staff at appropriate international and regional meetings
- Development and passage of appropriate comprehensive animal health legislation
- Further assessment of veterinary services (PVS process)

Veterinary laboratory services

It is estimated that more than 50% of the work conducted in national and regional veterinary laboratories is directly related to diagnosis of avian influenza and other serious animal diseases that fall within the scope of this program. MARD recognizes the importance of fully accredited veterinary laboratories for diagnosis, monitoring and surveillance.

Donors have made a considerable investment into veterinary laboratories during the past 5 years but external support is still required especially given that Vietnam is recognized as a potential hot spot for emergence of new infectious diseases. Sufficient funds are required to pay for maintenance, calibration and upkeep of existing equipment. A phased replacement/upgrading program is needed for existing equipment (average life estimated at 5 years) and facilities and funds are required to ensure laboratories reach and maintain accreditation. This will include on-going international technical assistance. The laboratories require sufficient funds for staff and reagents to conduct required tests for avian influenza, differential diagnosis and diagnosis of other emerging diseases. At present a proportion of laboratory staff in regional and central laboratories are contract staff funded by donors to conduct additional work required for avian influenza diagnosis and surveillance.

The activities under the program for 2011-2015 for veterinary laboratories that will be funded by government include:

- Base line resources for operation of veterinary laboratories (utilities, permanent staff, building maintenance, supply of essential reagents)
- Organization of one laboratory network meeting per annum
- Construction of two new veterinary laboratories

Important activities for veterinary laboratories that can only be implemented fully if additional funds are available from donors include:

- Finalizing formal accreditation of all national and regional laboratories, including on-going international technical support for accreditation and compliance testing
- Renovation of existing regional centre laboratories to ensure their biosafety
- Employment of contract staff to conduct additional testing for avian influenza and other emerging infectious diseases
- Full program of calibration and maintenance and replacement/upgrading for existing equipment
- Reagents for additional surveillance and diagnostic testing for avian influenza and emerging infectious diseases
- Post-graduate training for veterinary pathologists and case managers
- Additional training on new laboratory techniques and detection methods for new pathogens
- Review of plans of proposed veterinary laboratories by international experts in laboratory planning and construction
- Additional laboratory network meetings
- Recognition of RAHO-6 as ASEAN regional reference laboratory for Classical swine fever

Veterinary field services

Public veterinary field services are mainly delivered by provincial level Sub Departments of Animal Health (SDAH) through District Veterinary Stations supported by veterinary paraprofessionals at the commune and village level. Some para-veterinarians are paid a small allowance by the government to conduct government activities and are paid as contractors for vaccination campaigns. The issue of appropriate incentives for animal health workers at the local level has been identified as a challenge for the animal health sector, and further work should be done in the coming period to review the experience of pilot activities and to replicate and scale-up successful approaches.

Overall the number of trained epidemiologists and disease investigators has increased but there is still a large gap at the provincial level and below in this area. There is a need for additional specialist and generalist epidemiologists/risk analysts and for species specialists in DAH and the SDAHs.

The number of private veterinarians is increasing. Links between the public and private sector need to be strengthened.

The extension system should be used to the fullest extent possible, in particular the commune extension staff, collaborators and agriculture extension clubs. Model activities

on village extension clubs should be developed and then expanded, promoting the role of community communications.

New comprehensive animal health legislation is being drafted and once passed it will be necessary to have appropriate enforcement capacity.

The activities under the program for 2011-2015 for veterinary field services that will be funded by government include:

- Baseline funding for staff provided by national and provincial authorities and for standard and limited emergency field operations
- Payment of a small allowance for selected commune-based veterinary paraprofessionals to conduct government-related activities
- Delineating the responsibilities of public and private sector veterinarians and paraprofessionals and building of public-private partnerships for delivery of veterinary services
- Conducting a review of the status of epidemiology units at provincial (SDAH) and regional (RAHO) levels to establish the best way to provide appropriate epidemiological services

Important activities for veterinary field services that can only be implemented fully if additional funds are available from donors include:

- A system for replacement of vehicles as they reach the end of their working life
- Formal training in basic and advanced epidemiology, surveillance and disease investigations through the form of AVET or similar training programme where the focus will also be placed on improved data analysis and interpretation
- Strengthening of undergraduate veterinary training especially in the areas of disease investigations and epidemiology, including establishment of twinning relationships with overseas universities

Quarantine/border services

Further strengthening of controls over international and interprovincial trade in animals and animal products is required to complement other measures aimed at minimizing the threat of avian influenza and other diseases. Long land borders and strong market forces make enforcement of international movement controls over live animals difficult. Enhancing enforcement capacity will be supplemented by improved regional and cross-border activities that will provide a better understanding of the drivers of illegal animal movement and introduction of joint measures to contain and, where feasible, to legalize this trade, backed by appropriate certification and inspections.

The activities for 2011-2015 for veterinary quarantine staff that will be funded by government include:

- Baseline salaries and maintenance of existing facilities

Important activities for veterinary quarantine services that can only be implemented fully if additional funds are available from donors include:

- Improved and new border control stations (See Gap Analysis)
- Training for border control staff
- Regional and bilateral meetings to enhance cross border liaison for transboundary diseases
- Additional studies in border areas to understand drivers of cross-border trade (including illegal trade)

Veterinary public health services

Public health will be enhanced through better facilities in markets, slaughterhouses and meat markets, and improved facility management, including improved regulation of hygiene standards and meat inspection (see the activities under the section on Modifications to Livestock Production below).

Additional funds are required for food testing laboratories and also to improve control over the use of agricultural chemicals in livestock, with a special focus on banned substances and improper use of antimicrobial compounds. Increased residue testing will require upgrading of capacity of chemical testing laboratories

Surveillance and disease monitoring for potential public health threats will also be improved (see related activities below under Surveillance and Epidemiological Investigations).

The activities under the program for 2011-2015 for veterinary public health that will be funded by government include:

- Basic salaries and allowances for staff to undertake current core activities, including work in markets and slaughterhouses

Important activities for veterinary public health that can only be implemented fully if additional funds are available from donors include:

- Additional training in meat inspection and slaughterhouse hygiene
- Enhancement of capacity in food testing laboratories
- Enhanced capacity to regulate the use of antimicrobial compounds in animals

B. Strengthening of animal production services

A stock take of Vietnam's requirements for animal production services, both public and private, in line with the veterinary services reviews should be commissioned to determine the shortfalls in services available to producers and to develop a realistic plan to fill the gaps.

The activities under the program for 2011-2015 for animal production services that will be funded by government include:

- Salaries and basic allowances for national staff in DLP and livestock extension staff employed by provincial departments

Important activities for animal production services that can only be implemented fully if additional funds are available from donors include:

- Review of scope of animal production services required by the livestock sector (public and private) and the current status of these services (using a process aligned with the OIE gap analysis for veterinary services) including shortfalls in manpower and ways to provide support to the developing livestock sector
- Support for training in spatial planning and developing and assessing livestock development plans
- Training in farm biosecurity for animal production staff (including biosecurity standards and conduct of audits)
- Training in implementation of appropriate market hygiene and traceability systems
- Revision of and training in application of GAHPs for livestock farms of different sizes
- Support to strengthen the public-private relationship in the livestock sector, including (i) assessing the role of the private sector in seed production, animal feed, veterinary service and agricultural extension; (ii) support for institutional development to promote public-private partnerships in livestock production; and (iii) annual training, conference, workshop at national, regional and international level

DISEASE CONTROL AND PREVENTION

The objectives of activities under this sub-program are to improve the response to new diseases and to reduce the effects of serious endemic diseases of animals, including those that have major public health implications. Preventive measures that relate to the manner in which animals are reared, transported and sold are covered under the activities on livestock production.

Disease control and prevention will be achieved through a combination of measures with a renewed focus on longer-term measures that minimize the risk of virus incursions into livestock (including poultry flocks).

Investigations into alternative vaccines, quality of vaccines and vaccination strategies will be undertaken to support the vaccination program.

Disinfection is used widely in Vietnam as a control and preventative measure but is often conducted in a manner that is likely to have limited effect on pathogens given the

ease of inactivation of many disinfectants in the presence of organic matter. Improvements in the efficiency of use of disinfectants and proper methods for cleaning prior to disinfection will be promoted.

On-going rapid response training for local authorities will be provided. The best mechanisms for delivery of rapid expert support teams to outbreaks of disease will be determined and implemented.

Applied research into avian influenza and emerging infectious diseases will continue, focusing on key gaps in knowledge that currently hinder control, prevention and rapid identification of these diseases, including studies on improved vaccines and changes to viruses that will affect vaccination programs. The research program will involve NIVR and units within DAH in collaboration with donors, NGOs, international agencies and academic institutions, building on links that have already been established. Not only will this research result in improvements in knowledge but it also provides an excellent training environment for veterinarians allowing post-graduate development to be undertaken in country.

Diagnostic capacity will be enhanced. RAHO-6, once relocated, will undergo necessary processes and improvement to become an ASEAN regional reference centre for classical swine fever. A strong regional and international focus on disease control and prevention will continue with links maintained to international agencies and academic institutions and related programs such as GFTADS, SEAFMD.

National disease control and prevention plans will be updated regularly for all major diseases and provinces will be expected to develop plans for disease control prevention and elimination, starting initially with HPAI. At the village and commune level, programs will be developed to encourage local residents to build disease prevention plans for livestock in small flocks, based on models already in place. Donor support will be sought to review existing examples developed for and by small-scale poultry producers and to develop additional commune- or village- based activities, based on these or other suitable models. Implementation of such measures will require close cooperation between district and provincial animal health and extension staff, DAH and DLP.

Key activities for disease control and prevention

Key activities that are expected to be completed in the next 5 years and used as indicators of success for this element are:

i) All provinces develop and implement plans for control and prevention of avian influenza for the period 2011-2015 based on central guidance

ii) At least 5% of districts in Vietnam have one or more commune or village/hamlet-based disease control programs in place (e.g. village poultry health programs).

iii) Development and verification of multiple, fully functional compartments that are verified free from H5N1 avian influenza without vaccination

The activities under the program for 2011-2015 for disease control and prevention that will be funded by government include:

- Basic salaries and allowances and equipment and materials for staff involved in rapid response to disease outbreaks and existing control and preventive programs including vaccination programs
- Vaccines for targeted vaccine programs for selected major animal diseases
- Updates of national disease control and prevention plans for all major diseases

Important activities for disease control and prevention that can only be implemented fully if additional funds are available from donors include:

- Replacement/replenishment of emergency supplies of PPE and materials for cleaning and disinfection
- Additional training in appropriate methods of cleaning and disinfection
- Training extension workers as an efficient reserve force in the disease prevention and control.
- International support for review of vaccination/disease control and prevention strategies
- Applied research into vaccination against important infectious diseases (including improved vaccines and vaccination strategies)
- Mock outbreak responses at commune level
- Replacement of supplies for vaccinators (provided by donors from 2005)
- Implementation of compartments for the poultry sector
- Provincial plans for disease control prevention and elimination, starting initially with HPAI.
- Applied research into avian influenza and emerging infectious diseases, focusing on key gaps in knowledge that currently hinder control, prevention and rapid identification of these diseases,
- Maintaining links to international agencies and academic institutions and related programs such as GFTADS, SEAFMD at the operational level.
- Review of existing examples of livestock health programs developed for or by small-scale producers and to develop additional commune- or village- based activities, based on these or other suitable models.
- Review of existing MARD technical transfer activities related to biosecurity and GAHP, indentifying strong and weak points and constraints to adoption.

SURVEILLANCE AND EPIDEMIOLOGICAL INVESTIGATIONS

Appropriate active and passive surveillance programs must be maintained for avian influenza and for emerging and re-emerging diseases. Well-executed surveillance programs and epidemiological investigations enable assessment of the effectiveness of control programs and provide the information needed to modify approaches to prevention and control of avian influenza and for detection of emerging diseases.

Passive surveillance programs need to be strengthened to ensure disease outbreaks are reported by providing appropriate incentives and by having systems in place at the local level that facilitate reporting. The specific programs will include full investigations of all suspected cases of HPAI including tracing and disease reporting. Joint investigations with health authorities will be conducted when human cases or confirmed avian cases occur.

Veterinary staff who have undergone postgraduate training will be encouraged to write up disease investigation reports as case studies.

All provinces will develop and implement their own disease surveillance plans based on central guidance and will report these to DAH. Surveillance for H5N1 HPAI viruses will be focused on outbreaks and at markets and slaughterhouses to improve knowledge of influenza virus circulation and effectiveness of interventions through long-term changes in virus prevalence.

Compartments and selected farms will demonstrate on-going disease-free status through active surveillance programs. Further studies will be conducted on the interactions between pigs and poultry and the influenza viruses found in and shared between these two animal populations. Applied research will be conducted into diseases of wildlife and the potentially harmful organisms they carry, especially at the human-animal interface and along production and market chains.

Key activities for surveillance and epidemiological investigations

Key activities that are expected to be completed in the next 5 years and used as indicators of success for this element include:

i) At least 90% of provinces develop appropriate disease surveillance plans (based on central guidance) and provide appropriate reports to DAH.

ii) At least 90% of suspected outbreaks and cases of infection with H5N1 HPAI are fully investigated, traced and reported, with joint investigation teams investigating all suspected human cases.

iii) Studies conducted on livestock and wild animals to improve understanding of avian influenza persistence and the drivers of emergence/re-emergence of other diseases, through analysis and studies on production and market chains with a focus on key risk points and players in these chains ('value chain approaches to risk management of animal diseases').

The activities under the program for 2011-2015 for surveillance and epidemiological investigations that will be funded by government include:

- Appropriate post vaccination monitoring of the response to vaccination in poultry
- Submission of samples from disease outbreaks in livestock and other animals for specific disease analysis, including differential diagnosis
- Disease outbreak investigations for avian influenza (including joint investigations with human health staff) and other important infectious diseases

Important activities for surveillance and epidemiological investigations that can only be implemented fully if additional funds are available from donors include:

- Appropriate active surveillance in selected markets and slaughterhouses for avian influenza viruses to demonstrate changes in levels of infection over time
- Appropriate surveillance in wild animals for infectious agents and studies of wild animal trade to identify key areas of risk, through cooperation between DAH and FPD within MARD as well as the Biodiversity Conservation Agency of MONRE
- Improvements to databases used for recording and reporting surveillance and disease investigations
- Additional training for front line veterinary paraprofessionals in identification and reporting of disease outbreaks by clinical syndrome
- Additional studies on incentives for disease reporting including compensation systems so as to improve reporting systems
- Appropriate surveillance to demonstrate on-going freedom from infection with H5N1 HPAI in compartments and other enterprises
- Additional training in disease investigations and epidemiology (see the activity on Strengthening Veterinary Services above)
- Development and implementation of appropriate provincial surveillance plans
- Improved modelling of selected diseases based on better quality field data
- Studies into production and market chains to establish key risk points for disease transmission and persistence

MODIFICATIONS TO THE LIVESTOCK SECTOR

The manner in which livestock and commercially-farmed wildlife are reared, transported sold and processed are key risk factors for the emergence and persistence of animal diseases. A range of generic (non-pharmaceutical) measures implemented by farmers and traders can reduce the risk of incursion, persistence and transmission of pathogens in farms and markets and therefore reduce the threat of emerging infectious diseases.

Activities to control and prevent avian influenza and other emerging diseases related to the way animals are reared fall within DLP's three main priority areas for development of the livestock sector to 2015, which are:

i) to promote livestock production restructuring towards disease free zones and improved biosecurity, better risk-based management and reduce environmental pollution

ii) to enhance management capacity along the livestock production chain including breeds, feed, feeding, slaughtering, processing and marketing as a whole

iii) to support the private sector to build and develop sustainable livestock production models in accordance with Viet GAHP

Improvements to farm biosecurity measures will form a cornerstone of activities to prevent avian influenza and other emerging diseases on both domestic livestock and commercial wildlife farms. This will require cooperation between animal health, livestock production and forest protection agencies at all levels.

Draft standards for farm biosecurity measures applicable to different types of poultry farms have been developed and once approved will be introduced to farmers, accompanied by certification schemes for farms that meet and maintain the standards. Certification can then be used as a marketing tool to gain access to lucrative urban markets and slaughterhouses that demand high production standards. The possibility of linking biosecurity certification to GAHP certification will be explored[7]. Under existing protocols and proposals it is possible for farms to be certified as 'biosecure' without practising GAHPs.

Initially the standards will be voluntary codes but it is expected that during the next 5 years a shift towards mandatory standards will be implemented starting with large scale farms and gradually extending the program to smaller farms.

Further studies on production and market chains will be conducted in conjunction with DAH to identify key risk points along the chains and to identify the key decision makers and their motivations to ensure that any proposals to change production and marketing practices have a better chance of success. This process will be facilitated by promoting stronger associations of producers and traders and closer liaison between these associations and government.

Livestock waste not only represents a major ecological hazard but can also spread infectious diseases if not handled correctly. Prevention of infection transmission will be used as one of the drivers for increasing controls over and better management of livestock waste. Globally, the next 5 years will see a greater push towards responsible livestock production in an effort to reduce green house gas emissions and pollution by livestock. If no action is taken in this area global warming is expected to occur and the range of livestock diseases is expected to increase. This provides another impetus for better management of livestock waste and improved production efficiency. A shift away from pork to poultry production will be promoted to maximise the return from expensive livestock feed and to reduce pollution loads.

[7] It is recognised that not all farms that achieve appropriate biosecurity standards will meet all GAHP requirements.

Markets and slaughterhouses are currently the responsibility of provincial and urban authorities. Some controls are already implemented on animals introduced to these places and will be required for large wholesale markets and slaughterhouses within the next 5 years. These measures will require close cooperation with owners and managers of facilities including those that are privately run.

Market-driven measures will help to drive improvements in farm biosecurity and health status as urban markets increasingly demand animals reared under biosecure conditions, with no evidence of disease, no harmful chemical residues and meeting certification requirement for vaccination. Supportive communications can contribute to hastening the impact of market forces by stimulating demand for certified products.

Key activities for modifications to the livestock sector

Many of the modifications to the livestock sector will be funded by the private sector. However, government intervention is required to ensure that any new or expanded farms do not pose a hazard to animal and human health or to the environment. Enhanced coordination between DAH, DLP and FPD within MARD and clarification of responsibilities for different aspects of commercial wildlife farming will be important to ensure effective State management in this area.

Key activities that will be completed in the next 5 years and used as indicators of success for this element include:

i) Systems that allow full traceability of all livestock (including poultry) to all large livestock and poultry markets and slaughterhouses. All of these enterprises will have disease prevention plans in place to minimise the risk of entry of infected poultry and livestock

ii) 80% of all poultry farms with more than 2000 head of poultry have and are applying appropriate biosecurity plans

iii) 70% of provinces will be implementing livestock development plans that have been assessed for feasibility by DLP

The activities under the program for 2011-2015 in the area of 'modification to the livestock sector' funded by government include:

- Preparation and review of national and provincial plans for the livestock sector
- Operation of the Biosecurity Working Group

Important activities under the category 'modification to the livestock sector' that can only be implemented fully if additional funds are available from donors include:

- Development of and training in biosecurity standards and biosecurity audits
- Development of improved biosecurity plans for livestock planning zones

- Development of plans for risk warning systems using broad network of agricultural extension (focal point is the National Agricultural Extension) with the coordination and support of communication.

- Upgrading of slaughterhouses and retail markets[8]

- Modification and application of GAHPs and GAHP certification (especially modification of GAHPs for small-scale producers)

- Implementation of appropriate waste treatment systems on livestock and commercial wildlife farms

- Introducing practical livestock identification systems that allow tracing of poultry and other livestock and wildlife species from farms to wholesale markets or slaughterhouses

- Risk management in free grazing duck production in the Mekong Delta including (i) assessing the status of breeding ducks after 7 years of avian influenza; (ii) assessing the implementation of government regulations on free grazing duck production; (iii) additional research on management initiatives and additional regulation of the management of duck breeding; (iv) building management capacity for local livestock staff; (v) training and modelling of controlled duck breeding; vi) organising conferences to review results of implementation

- Support for innovation in poultry hatcheries and associated market chains including (i) assessing the status of day old bird supply across the country; (ii) assessing the implementation of government regulations on the hatching systems; (iii) additional research on management initiatives and additional regulations on the hatching system; (iv) building management capacity for local livestock staff in this area; (v) training and modelling of poultry hatching; organizing conferences to review results of implementation

- Support to risk management in farm rearing of wild animals including (i) assessing demand and potential of developing 'domesticated' wild animal production; (ii) assessing potential risks of emerging infectious diseases from farming of wild animals; (iii) training in technical measures associated with wild animal production; (iv) pilot model of wild animal farming; (v) organising conferences to review implementation of results

- Managing the risks of livestock waste

COMMUNICATIONS AND EXTENSION ACTIVITIES TO PROMOTE PUBLIC AWARENESS AND BEHAVIOURAL CHANGE

With regard to communications and extension activities, the animal health and livestock

[8] Much of the investment in this area will be provided by the private sector but programs such as LIFSAP will provide funds to upgrade meat markets and slaughterhouses in selected provinces linked to improvements in management practices to reduce the risk of disease

production sectors takes the lead on raising awareness and promoting behaviours associated with: (1) the timely reporting of diseases in livestock and wildlife; (2) application of good animal health practices in livestock and wildlife farming and trade; (3) safer livestock and wildlife handling practices in slaughtering, transport and marketing; and (4) communication about key policies, programs and regulations related to the animal health and livestock production sectors.

Changes to the way that livestock are reared and sold require cooperation from producers, traders and transporters, and consumers. Such changes will only be implemented if those involved see sound reasons to change their practices. This is particularly challenging in the current context of low risk perception amongst key target groups. Behaviour change can be achieved in part through regulation (and enforcement of regulations) but is easier to manage if those involved see the benefits of changes. Experiences with avian influenza over the last five years have demonstrated the importance of involving communication experts, technical experts and end users in the design and implementation of behavioural change and communication campaigns. Mechanisms based on those that have been successful in the past should be used in developing appropriate communications packages.

Significant changes in the overall control strategy, particularly related to the coverage of compulsory vaccination, are currently taking place and further changes can be expected during the coming period. Changes in the virus strains circulating in different parts of the country and the results of efficacy testing of available vaccines against these strains also need to be taken into account. These changes require consideration of supportive communications to raise awareness of new policies and regulations.

Utilization and capacity-building of the veterinary and extension services at all levels should be a priority for communication activities in the period 2011-2015. Communication training and support should be provided to commune extension workers, extension clubs and village collaborators.

Key types of communications for the agriculture sector to be addressed in the strategic framework for communications in the coming period include:

- Communications on ongoing and seasonal risks of outbreaks of HPAI. These communications could also be extended to other diseases in livestock and wildlife depending on the actual situation and risk analysis.

- Communications on the dangers of handling, butchering, preparing and consuming sick or dead poultry, and the need to report diseases in poultry and other livestock on wildlife. Particular attention to communications on the dangers of handling of sick or dead animals in remote and poor areas is required based on lessons learned in the previous period. Communications to promote awareness of changes to the compulsory vaccination program for poultry. These communication activities should address awareness of the changes to the program, awareness of the potential for increased risk of outbreaks, increased awareness of reporting pathways for small-scale producers for types of poultry that will no longer be subject to compulsory vaccination, and communications in cooperation with the human health sector on possible increased risk to humans

related to these changes.

- Communications on improved farming practices that can contribute to long-term risk reduction of disease transmission within and between different animal species and to humans through changes in the way that livestock and wildlife are reared, handled and traded. Communications should address the role of farmers and producers of livestock and commercially-farmed wildlife for community health.

- Communications to promote GAHP and effective farming models for raising poultry (or other livestock), relevant to the livestock production profiles and risks of different areas of the country.

- Measures to improve the quality of hygiene in markets, slaughterhouses and meat markets. Where possible, these efforts should be linked to and mainstreamed into ongoing wider initiatives on food safety.

A range of communication approaches should be considered, depending on the specific contents and targeted populations.

Consideration should be given to the need for communications to both agriculture sector and health sector officials and workers and the general public on the ongoing risks of disease transmission within and between different livestock and wildlife species and humans and behaviours that can reduce these risks, applying a One Health approach.

A review of the benefits of avian influenza communication programs, including school based activities, should be conducted to ensure that successful programs can be replicated and features of successful programs utilised in other programs.

The development of detailed communications and agriculture extension for the agriculture sector in support of AIPED needs to clearly identify the roles and responsibilities of specific agencies within the agriculture sector and other key stakeholders at all levels. The coordination mechanism for communication and extension activities in the agriculture sector should also be enhanced during the coming period. The role of the National Agriculture Extension Centre (NAEC) under MARD, working closely with DAH and DLP, and of the agriculture extension network down to the local level should be brought fully into play.

The activities under the program for 2011-2015 in the area of public awareness and behavioural change funded by government include:

- Annual publicity campaigns during high risk periods and in areas where vaccination campaigns are being modified

Important activities for public awareness and behavioural change that can only be implemented fully if additional funds are available from donors include:

- Review of BCC campaigns and programs including school based programs to determine which methods warrant replication

- Development of appropriate communication package to discourage butchering of dead or sick poultry or other livestock or wild animals

- Development of appropriate extension and training package for slaughterhouse and market workers on disease control and prevention and hygiene measures

- Development and dissemination of appropriate demonstration models for disease control through the livestock production chain.

All of the above activities will need to be coordinated by MARD and aligned with similar human health activities conducted by MOH.

Component III - Pandemic Preparedness and influenza and emerging infectious disease prevention in the Health Sector

Component III outlines activities related to enhancing national preparedness planning, strengthening surveillance, response, clinical and laboratory based diagnostic capacity, curative care services, preventive medicine units, communications related to behaviour change, risk and operations, and biomedical, social and other research.

NATIONAL PREPAREDNESS

National preparedness for containment and response to, and recovery from, a serious pandemic caused by a new strain of influenza or another novel infectious disease is an important national task that covers both the health sector and other sectors, taking into account potential impacts on both human health as well as many other important aspects including ensuring the continuity of essential services and infrastructure (including energy, food, health care, water and sanitation, telecoms, finance and banking, law and public security, public utilities and transportation), effective public communications, dealing with absenteeism, addressing macroeconomic and livelihoods impacts, managing impacts on movement of people and goods within the country and across national borders and the impacts on trade and tourism, and a wide range of other issues.

The NSCHP chaired by the Minister of Health brings together the key sectors related to the health and other impacts of a potential serious human pandemic. Equivalent steering committees at the provincial and lower levels similarly bring together health and non-health sectors to coordinate multi-sector preparedness and response to human pandemics under the overall leadership of the People's Committees at each level.

Strengthening the resilience of communities for a severe pandemic has been identified as a key component of effective whole-of-society preparedness. In additional to the important role of local authorities, the mass organisations such as Farmer's Union (FU), Women's Union (WU), the Vietnam Red Cross network and other community organizations play an important role in this regard.

Revision of the national plans. A formal comprehensive review of the national response to the influenza A/H1N1 pandemic of 2009 will be carried out by MOH together with WHO in early 2011, including consultations with a wide range of stakeholders (government, non-government, civil society, communities, private sector, media and donors). The National Steering Committee on Human Influenza Pandemic Prevention and Control will review the findings and implement changes to the national plan as appropriate. Consideration should be given as to whether the current phases in the 2009 national action plan were adequate - for instance, many other countries have more phases than Vietnam potentially allowing for a more flexible, differentiated approach tailored to the local evolution of the pandemic. The process and timing of the change of phases in Vietnam and whether there was a need for different parts of the country to operate under different phases could all be examined.

Cross-sectoral preparedness, business continuity and maintenance of essential services are other elements of national preparedness that need strengthening during 2011-

2015. While some of these activities are beyond the health sector, MOH can provide guidance for other sectors in developing their own pandemic plans. The health sector should also ensure effective business continuity planning to maintain essential health services in the event of a pandemic, including health services apart from the direct pandemic response - such as for maternal and child health, addressing other diseases and maintaining intensive care facilities - assuming a high risk of significant absenteeism.

A number of other recent and planned reviews have been conducted, as have simulation exercises at different levels of the health system. The findings of these activities must feed into the redraft of the national action plan for pandemic influenza and other relevant national plans (such as the National Strategic Framework for Avian and Human Influenza Communications and the National Infection Control Action Plan 2010-2020).

GoV ACTIVITY (selected)	Organisation(s) supporting GoV	Date
Communications strategy of NSCHP Communications sub-committee Midterm review	WHO	Dec 2010
Review of the H1N1 response in Vietnam	WHO	Dec 2010
2010 Vietnam report on progress on IHR (2005)	WHO	Early 2011
New work plan for APSED 2010 for the next phase	WHO	Mar 2011
Lessons learned from AI/ pandemic H1N1 communications supported by GoV/UN Joint Program	UNICEF	Mar 2011
Review of community based model	Abt Associates	Early 2011
Assessment of pandemic preparedness of civil society	Vietnam Red Cross/ IFRC	Early 2011
Midterm review of the Integrated national operational program for avian and human influenza (OPI) 2006-2010	PAHI	Completed 2010
Public-private partnerships for communicable disease control (Shanghai meeting)	ADB	Completed 2010
Midterm reviews of UNJP and VAHIP	UN/ World Bank	Completed 2009
Business continuity plans	ASEAN	Completed
Laboratory review	US-CDC	Completed

At least one mathematical model has projected different pandemic scenarios in Vietnam based on varying assumptions.[9] More detailed scenario modelling that includes cost estimates (such as have been recently done by the World Bank in Mongolia and China) would sharpen national pandemic preparedness and allow for more accurate, sustainable financial planning.

The national plan for pandemic influenza should be expanded so there are multi-sectoral strategies to address other emerging and re-emerging infectious diseases that pose a national epidemic or pandemic threat.

Regular (annual or biennial) reviews of the national action plan are required to adapt to shifting local circumstances.

[9] Boni MF, Bui MH, Pham TQ et al. Modelling the progression of pandemic influenza A (H1N1) in Vietnam and the opportunities for reassortment with other influenza viruses. BMC Medicine 2009, 7:43 doi:10.1186/1741-7015-7-43.

Operational planning and simulation exercises. Strategies and plans crafted at national level have not been systematically transformed into operational directives that improve preparedness and responses to HPAI, pandemics and emerging infectious diseases throughout the country. Part of the focus of this plan for 2011-2015 will be to address these shortcomings. Simulation exercises are an important means of testing systems and action plans and allowing feedback from lower levels of the health system. They can reveal if central level plans are out of step with provincial level budgets, capabilities, and priorities. Simulations are especially relevant in refining operations that involve many different groups. Exercises involving multiple stakeholders to respond to a simultaneous infectious disease outbreak and natural disaster can examine how these potentially parallel systems would cooperate during an emergency. In line with the application of a One Health approach, consideration should be given to simulations of other potential emerging zoonotic diseases, including risks from mixed farming of livestock and wildlife species.

Policy and strategy development. The human health sector needs to focus on the integration of HPAI and pandemic preparedness activities into the control framework for a range of communicable diseases. This includes looking for synergies with health structures and activities beyond infectious diseases (such as disaster management systems, water and sanitation projects etc.) Activities under this plan for 2011-2015 are more risk based than before, reflecting the change in agricultural sector responses and changing epidemiology of HPAI.

With the development of numerous central level mechanisms, procedures and guidelines for tackling influenza and communicable diseases, the focus must now shift to strengthening the capacity of provincial and district preventive and curative health units which is consistent with national decentralization plans.

The national strategy needs to expand to involve the private health sector in planning, preparedness, response, and recovery.

Preparedness and response plans are well underway, but there is a pressing need for prevention planning for zoonotic disease threats to human health. An upstream preventive strategy needs to complement national preparedness. Such a plan would encompass elements of assessment, surveillance, diagnostic capacity, and response, extending the focus of these from the health of poultry to other livestock and wildlife, also considering the health of the agro-ecosystems which animals and humans are part of. A wide range of stakeholders needs to be represented to formulate policies and decisions relating to ecosystem health and its potential consequences for human health and livelihoods.

STRENGTHENING SURVEILLANCE AND RESPONSE

Improving surveillance for infectious disease threats and Early Warning and Response Systems (EWARS). Under the OPI 2006-2010, the Department of Preventive Medicine has progressively strengthened the routine surveillance system for 26 nationally notifiable communicable diseases including introducing piloting of electronic reporting mechanisms in selected provinces and passing the new Law on Communicable Disease Control. These improvements need to be consolidated and

strengthened during the coming period, including dissemination of the new law to all health personnel, progressive computerization of the surveillance system, and regular reviews are required to confirm that the system is sufficiently sensitive to detect outbreaks and that it stimulates timely, appropriate public health action. The operational capacity of system components during a major public health crisis also needs to be examined.

Vietnam has introduced a diverse range of surveillance mechanisms for early detection of disease threats including community level event based surveillance, reporting hotlines, facility based detection of clusters of cases (severe pneumonia), and virological monitoring of respiratory viruses in sentinel sites.

Over the long term, recurrent funding for sentinel surveillance sites for seasonal influenza and influenza-like illnesses needs to be secured, sufficient for a suitable number of sites to produce reliable national data. Consideration should also be given to scaling up and replicating pilot programs on community-based surveillance.

All these systems need to be integrated such that different streams of surveillance information feed into a single, well-planned, coordinated and comprehensive approach to monitoring communicable disease threats. With regard to zoonoses, community level surveillance needs special attention given existing weaknesses in animal health surveillance when compared to the human health sector with its established infrastructure down to commune level. Extension and strengthening of community-based surveillance should be focused on high-risk areas, and tied in with risk and behaviour change communications. An expanded role for civil society groups and NGOs to support district and commune health departments should be explored in this respect.

Establishing a surveillance system for monitoring viral drug resistance is a priority of the NIHE to inform treatment protocols. Similarly, health facility based surveillance for antibiotic susceptibilities of bacteria is an important component of monitoring for emerging infectious disease threats (and of relevance in assessing hospital infection control practices). To be functional, these systems require improved cooperation between the preventive medicine department, the curative health department and reference laboratories. Study tours in the region may be of value in learning how to design and maintain these systems particularly hospital based surveillance and how this links back to infection control practices.

Communicable disease surveillance among the private health sector is an important missing link. Education of private professionals on the Law on Communicable Disease Control and the requirement to report selected conditions is a valuable first step. Implementation of rumour surveillance is one way of linking in private practitioners until they can be included in more formal reporting systems. Current issues with regulation and registration of private practitioners, however, limit their comprehensive inclusion in established surveillance systems.

Rumour surveillance is also of importance in areas considered at high risk for emerging diseases. Engaging the general public, community leaders, workers from key occupations and the local media can expedite reporting of unusual occurrences in strategic locations. This could be an important measure as the animal health sector

proceeds with the zonal tactic of controlling and eventually eliminating HPAI. Of course, this means that risk criteria would need to be defined and risk assessments conducted in partnership with animal health personnel.

Information exchanges between human and animal health sectors need to be improved so that timely (coordinated) action can be taken for communicable disease control. Legislation will provide a base for this cooperation but will need to be made operational to the lowest levels of government. Consideration will have to be given to how the different structural divisions of Agriculture and Health - the separation into a different number of ecological areas - impacts on surveillance communications and who is accountable for managing responses.

Sharing of surveillance data within the health sector also needs to be progressed. Procedures need to be developed to guide provincial preventive health departments on when to communicate with provincial hospitals and with counterparts in neighbouring provinces to control and prevent the spread of disease. The vertical flow of information needs to not only work for reporting up the health system chain but feedback on reporting needs to be communicated downwards to provincial, district and commune staff.

Cross border data sharing works through existing mechanisms such as the ADB greater Mekong sub region communicable diseases control project, the Mekong Basin Disease Surveillance Project, ASEAN and bilateral agreements with China, Lao PDR and Cambodia. Vietnam's advancement and WHO reviews of APSED work plans and on implementing IHR should assist in strengthening these mechanisms. MOH needs to ensure that on time data are available for public health managers and others responsible for monitoring points of entry into Vietnam.

Facilitating rapid investigation and containment activities through the development of rapid response teams. New standard short course epidemiological training Package that include follow up monitoring and support have been developed by the NIHE for provincial and district preventive health staff to bolster their ability to analyse data, conduct outbreak investigations and institute control measures. Training needs to be scaled up so that all local public health workers are equipped with basic epidemiological, information technology, communications, and management and leadership skills. This will improve the use of data locally (especially as systems are computerised) and increase the proportion of incidents that are rapidly and competently examined provided there is in-built oversight and monitoring of these activities. Related to this, standardised reporting forms must be developed to ensure minimum data are gathered during investigations and senior preventive health staff must give feedback on the performance of investigators.

Given the limited human resources in provincial public health units, the preventive health department needs to establish coordination mechanisms between neighbouring provinces in the event that multiple simultaneous events require concurrent investigation.

Inter-professional relationships need to be fostered at provincial and district levels for investigation of events that involve animals and humans. Specified roles and

responsibilities should be drafted for multi-sectoral investigations of outbreaks. The number of joint investigations undertaken by animal and human health staff should be monitored and completion of a standardised investigation report must be mandatory.

Although documented under the OPI 2006-2010, material needs remain including dedicated vehicles for undertaking field investigations, PPE, and specimen collection kits.

Building skills and human resources through the establishment of an FETP. Significant progress has been made on developing basic and advanced applied epidemiological skills for key health personnel since 2006. As mentioned, short courses are being rolled out to provincial and district staff nationwide. The existing arrangement of post-training reporting requirements and mentoring are sound but need to be maintained to establish core epidemiological competencies as necessary elements of competent public health practice.

The health system needs to quickly address the current ambiguities related to the career advantages of undertaking longer training courses such as the full two-year FETP during 2011. This could be achieved through accreditation of the course as a university masters degree or through explicit benefits within the health system itself (such as specific positions, links to salary or opportunities for promotion). Without these mechanisms, the course could remain unattractive to potential applicants and could send the signal within the sector that these competencies are not valued. Current financing and the limited number of qualified mentors available locally for FETP trainees means that health sector capacity in applied epidemiology will only slowly develop. The program will therefore require long-term funding.

Further links with the AVET program need to be fostered such that both programs have a common set of attitudes, values and teach common core technical skills. These investigatory, analytical, communication and management skills will provide a solid foundation for the next cohort of public health managers. Common standards and behaviours combined with the appreciation of the perspectives of other disciplines will advance collaboration between interdependent sectors. There are likely to be efficiencies in jointly running shared aspects of the courses or even in amalgamating the programs.

The experience of FETP (and AVET) trainees among countries in the Mekong Basin sub-region needs to be promoted. Consideration should be given to more formal linkages and exchange programs.

Strengthening control of infectious disease threats at international borders. Continued strengthening of surveillance and response capacity at points of entry is required during 2011-2015 with provision of infrastructure, equipment and staff training. Ready links between border posts and public health laboratories, designated hospitals and preventive health departments need to be reinforced. With attention, Vietnam should be able to meet its IHR (2005) obligations related to management of infectious disease threats at border posts by 2012. Public health managers need to be mindful of the limitations of border control measures particularly for land borders and for some infections (such as influenza). Transparent, regular cross-border information

exchanges at province and national level are important, as is a strong public health surveillance system in communities and health facilities closely connected to border posts.

STRENGTHENING DIAGNOSTIC CAPACITY

Improving laboratory facilities and equipment. Support for laboratories during 2006-2010, has led to the establishment of four reference laboratories[10] and PCR capacity in 22 national institutes, 8 referral hospitals and 32 preventive medicine centres. This network has significantly reduced the time for sample processing and return of laboratory confirmed diagnoses. The challenge now is to ensure inclusion of all laboratories in the national surveillance system, strengthen internal and external quality assurance mechanisms, institute regular staff training on laboratory testing and biosafety, and evaluate timely access to testing across Vietnam. A smaller number of linked laboratories providing prompt, reliable testing may be a safer and more efficient option than providing all provinces with specialist diagnostic capacities. Existing facilities must be maintained and the sustainability of testing practices within the national budget also needs to be reviewed. The network of laboratories should be supported to meet to share lessons learned and plan coordinated activities.

Strengthening pandemic preparedness in public health laboratories. The performance of laboratories during the 2009 influenza H1N1 pandemic needs careful review. Pandemic preparedness plans should assist laboratories to manage demand and function safely by better defining the national strategy for laboratory surge capacity to quickly increase the number of tests performed including logistic and procurement arrangements, surge capacity for support services such as pathology, blood and radiological services, rationing of non-essential laboratory tests during an established pandemic, maintenance of services (power, water) to keep laboratories operational, and decision rules on when to wind back testing during different phases of a pandemic. Plans should identify what types of testing are expected to be carried out under different scenarios.

Rapid point-of-care tests for influenza. There are tests available which have the potential to streamline diagnostic processes and reduce demand on laboratory services. However, all these tests have limitations. There is a need for a framework for evaluating and introducing rapid tests for influenza and other infectious diseases into Vietnam. Such a framework would assess the nature of the condition in the population, the characteristics of the rapid test, and the performance of a test program including economic and social aspects. If suitable for introduction, guidelines are required to ensure correct use of point of care tests during routine practice and outbreaks.

Collaboration between animal health and human health laboratories. The degree to which this is necessary should be explored particularly given the higher biosafety level capacity of human health laboratories compared to animal health facilities available in Vietnam. At least one joint meeting annually should be conducted.

[10] NIHE (BSL3) covering 28 northern provinces; Nha Trang Pasteur Institute (BSL2+) responsible for 11 central province; Tay Nguyen Central Highland Institute of Hygiene and Epidemiology (BSL2+) as the reference laboratory for the 4 central highlands provinces; and Ho Chi Minh City Pasteur Institute (BSL2+) responsible for 20 provinces in the south.

STRENGTHENING CURATIVE CARE AND PREVENTIVE HEALTH CAPACITY

- **Pandemic influenza preparedness and response strategy.** The curative care sector approach has been based on: (1) reinforcing capacity of the hospital system to recognize and respond to human cases of HPAI and influenza; and (2) preparing for surge capacity under a scenario in which there is a sudden, large increase in demand for treatment services across Vietnam.
- **Situation assessment and planning.** In 2010, the curative health sector conducted national mapping of capacity, gaps and needs with regard to equipment and training (including total beds, intensive care beds, numbers and skills of staff, equipment and facilities). Progress on addressing identified gaps will be monitored during 2011-2015.
- **Improving capacity to care for influenza patients.** Health workforce training in diagnosis, treatment, and use of newly procured equipment such as ventilators will provide benefit for the management of seriously ill patients regardless of the cause of their condition. Training of district health staff needs to be prioritised. Various guidelines (listed below) have been drafted but training Packages need to be developed and delivered to relevant personnel across Vietnam.

GUIDELINE	STATUS
Guidelines on diagnosis and treatment of influenza A/H5N1	Decision No.37/2005/QD-BYT dated 11/11/2005 Amended by Decision No.44/2006/QD-BYT of MOH dated 29/12/2006
Guidelines on influenza A/H5N1 infection control in healthcare facilities	Guideline for practice -2008 Updated amended documents 2010 being completed
Guidelines in diagnosis and treatment of influenza A/H1N1	Decision No.1440/QD-BYT dated 29.04.2009 (two days after WHO declared influenza pandemic) Supplemented document at Decision No.2890/QD-BYT of MOH dated 12/8/2009
Guidelines in set up field hospitals	Decision No. 2890/QD-BYT dated 12/08/2009
Handbook on Influenza A Prevention and respiratory diseases causing epidemic	Compiled
Handbook on Influenza A (H1N1) Prevention for local health facilities	In preparation

Specialist curative sector rapid response teams have been organised at tertiary referral hospitals to provide emergency assistance to provincial and district health facilities with the clinical management of patients with (suspected) emerging infectious diseases. The role of these teams and how they interact with investigations launched by preventive medical units needs to be defined. At least one evaluation of their performance including an economic assessment needs to be completed during the period 2011-2015.

Improving equipment and facilities for influenza patients and patients infected with emerging diseases. There is a need to improve the monitoring of resource distribution and use, and make certain that procurement does not outstrip the

curative sector's capacity to train staff in the use of new equipment. Some new equipment can be used for a range of infectious and non-infectious conditions and training needs to reflect this. Training must also ensure that new equipment does not pose unnecessary risks to patient and staff health (for instance, the lack of proper cleaning equipment for ventilators in some hospitals may have increased the risk of nosocomial infections). The focus in the first two years of the plan for 2011-2015 is to improve the treatment skills of district and provincial clinicians in centres that have received medical equipment during 2006-2010. Thereafter, a phased introduction of new equipment coupled with training will commence for 55 district and provincial hospitals. The construction of a 1,000-bed tropical medicine hospital in Hanoi by 2014 will provide a peak training centre for the clinical management of infectious diseases.

Improving infection control in hospitals is a vitally important aspect of managing emerging diseases that goes well beyond control of viral respiratory pathogens. Health facilities can themselves be sources of emerging infectious diseases. The Ministry of Health of Vietnam is currently developing the National Infection Control Action Plan 2010-2020. There is an urgent need for health workforce training on infection control based on these guidelines especially in local hospitals. Mechanisms must be established to monitor adherence to best practice and to identify and correct breaches in procedures. Specialist staff need to be assigned to monitor infection control practices in provincial and district hospitals. Hospital redesign including building isolation facilities, medical waste management processes and mortuary services in these hospitals would be valuable infrastructure advances to combat hospital-acquired infections. Materials such as disinfectants and personal protective equipment need to be provided adequately so that staff can comply with national guidelines. The distribution and use of this equipment needs to be tracked during a pandemic. Infection control during transitions of care is another important consideration, as too is education of private health sector providers. Guidelines for the appropriate use of antimicrobial therapies (for routine care and during a pandemic) is key to limiting the appearance of drug resistant microorganisms and must be communicated to private and public health care practitioners and the pharmaceutical sector. Sound management of this is intertwined with regulation of antibiotic prescribers and distribution of medications both in the human and animal health sectors.

Improve understanding of health seeking behaviours. This will assist government health facilities to develop more patient centred approaches to address barriers to accessing and utilising services and so reduce delays in the identification and treatment of patients with infections of public health concern.

Building capacity to respond to an influenza pandemic. A number of aspects will require strengthening during 2011-2015. Planning for the maintenance of influenza and life-saving non-influenza services during a pandemic needs to be improved at local hospitals. This should include prioritisation of non-influenza services. Health systems also rely on power, water, transportation and a range of other essential services to function. These aspects need to be better planned at local levels and involve the key (non-health) sectors that provide these types of services. A first step is to identify these interdependencies followed by the development of contingency

plans to maintain business continuity during a crisis and the establishment of a monitoring system to track critical vulnerabilities throughout a pandemic (and for any type of public health emergency).

Beyond the health sector, identification of critical infrastructure (food, water, energy, healthcare, emergency services, defence, transport, banking/ finance, telecommunications) and key resources (people, groups, facilities, equipment) to support wider business continuity and social order is required. The health sector can encourage interdependent ministries to plan for a pandemic through the national steering committee and organise multi-sectoral rehearsals. It is particularly important to develop coordinated multi-sectoral action at provincial levels given the ongoing decentralisation process, rather than just a series of parallel vertical plans. Ultimately, however, these planning efforts require direction and coordination from national leaders. Adequate budgets are required to develop and maintain operational pandemic plans. These plans must reflect realities with regard to human resources and relevance to provincial priorities.

The ability of health systems to provide appropriate care for influenza patients during a pandemic partly rests on how well they can reduce avoidable demand. Clear guidance on prioritising preventive and curative services during a pandemic is required for provincial and district hospitals. Home based care measures also need to be drafted and tested. Social supports that enable people to comply with public health interventions such as home isolation will need to be identified and included within local pandemic plans. The success of such measures is intimately linked to how well government communicates these measures and ultimately how compliant people are.

There are national guidelines for setting up field hospitals to cope with excessive demands on hospitals under a severe pandemic scenario. Coordinated communications and decision-making by preventive health units, hospitals and agencies such as the Vietnam Red Cross are needed for opening and staffing field hospitals to avoid overloads. Simulation exercises at provincial and lower levels will assist in making clear the responsibilities of stakeholders in directing and operating field hospitals. These aspects should be aligned with current protocols for disaster management.

The role of the military should be reviewed in the national action plan for consideration of the value they can add beyond the provision of emergency health services. For instance, logistics support, and maintenance of essential services and law and order.

The involvement of the private health sector in pandemic planning has been relatively neglected to date. Objectives and responses for different pandemic phases need to be considered for the private health sector by MOH. The wide variety of private professionals practicing in Vietnam can add value across the range of pandemic responses including surveillance, implementing infection control measures, supporting government directives such as social distancing measures and risk communications, and providing curative and supportive (e.g. psychological) services. Private practitioners also need to know when to refer patients to

government health facilities for diagnosis and management, and how to protect themselves and their patients from the spread of infectious diseases. The commercial sector can also play a role in the development, provision and distribution of affordable drugs, vaccines, diagnostics and equipment. It will be important to explore public-private partnerships that promote and protect public health before, during and after a pandemic.

Gaps were noted in a recent evaluation of the Vietnamese public health legal framework for addressing communicable disease emergencies (for example balancing individual and communal interests during a crisis, property management and control, and fast tracking vaccines).[11] These aspects will be addressed in the period 2011-2015. For instance, the review of the national 2009 pandemic influenza response should look at the process of implementation and impact of non-pharmaceutical interventions by the preventive health sector. It will be necessary to carefully assess how national security interests are balanced with public health concerns. For example, careful control of information about national and provincial stockpiles of essential medicines, vaccines and equipment can limit donor assistance for a critical element of pandemic preparedness.

There is also a need to establish mechanisms for inter-provincial coordination to prepare for, prevent and respond to health threats. One commonly suggested method to achieve this was to adopt a domestic regional approach based on *ecological areas*. However, ecological areas are defined differently by different government sectors, which may limit the value of this strategy for cross-sector planning unless common ecological boundaries are agreed on. There are additional structural and resource concerns with adopting a domestic regional approach with the health sector (such as potential conflict with decentralization process, lack of power, resources and capacity of ecological area personnel). Regardless, there must be improved information sharing, joint planning and collective action by geographically linked provinces.

A new tropical medicine hospital is to be completed in Hanoi in 2014.

IMPROVING RESEARCH

Research on avian and human influenza in Vietnam has largely focused on virological and epidemiological aspects that needed to be quickly understood to inform public health action. Key questions remain unanswered, however, and the following national research areas have been identified as priorities during 2011-2015:

1. *epidemiological studies of human and avian influenza;*
2. *risk factors for highly pathogenic influenza virus;*
3. *interaction of influenza viruses in humans and animals;*
4. *the evolution of influenza viruses in humans and animals;*
5. *community spread of influenza viruses;*

[11] Legal preparedness for responding to disasters and communicable diseases emergencies, study report, Vietnam. IFRC, ADB. 2009

6. *rapid diagnostic tests for influenza virus, particularly point of care tests;*
7. *vaccine development*.

Investigations should also be undertaken on *immunity to pandemic and avian influenza*, which has relevance to research on vaccine development. Research priorities within and across these eight domains need to be determined by MOH, NIHE and their partners. Greater cooperative links with the private sector would be valuable for innovative research in Vietnam.

Clinical, social, communications, policy, health management and system aspects germane to influenza and pandemic control and preparedness have largely been overlooked in favour of epidemiological and laboratory based research. The curative health sector would benefit from determination of optimal antiviral doses, duration of therapy and infection control measures for influenza. Successful models of behaviour change for decision makers, health workers, media, high-risk groups and the general public need to be identified, and the best modes and messages for risk communication established. An understanding of what makes for effective cross-sectoral coordination will be useful for systematizing multidisciplinary action. Research on the health of eco-systems and consequences for human wellbeing can advance measures to prevent diseases from emerging.

Development of an online national lessons learned database. The Behaviour Change Communications Working Group with the support of the Communications sub-committee is developing an online catalogue of relevant materials. This concept could be extended to other elements of the response to avian and human influenza and emerging infectious diseases and could include research findings, planning tools, lessons learned, best practices, standard operating procedures and experiences. Ideally, this will include learning from others beyond Vietnam and links to relevant resources, particularly information acquired from neighbouring countries. Information should be made available to policy makers, public health managers, health staff, researchers, media, general public, and donors. Such a development could also feed into determining regional research gaps and priorities, and allow for regional cooperation on research. In this way, research investments can be coordinated across the region, avoiding duplication and strengthening ties between countries and research institutes.

PUBLIC AWARENESS, BEHAVIOURAL CHANGE AND OTHER COMMUNICATIONS

With regard to public awareness and behaviour change, the health sector takes the lead on promoting behaviours associated with: (1) timely reporting of human disease; (2) improved personal hygiene and food safety; (3) compliance with medical regulations; (4) improved containment response if human-to-human transmission occurs; and (5) preparedness to mitigate and recover from a serious pandemic.

During the initial period of the new plan, the health sector will review the behavioural change communications work undertaken during 2006-2010 for HPAI to determine what worked, where, when and why. In addition to assessing the messages delivered and the mode of delivery, this review will also to look at structural and environmental aspects that positively or negatively influenced behaviour change. The experience of communications with Pandemic (H1N1) 2009 should also be reviewed in order to

identify key lessons for future pandemic preparedness and response. The analysis of actual human cases of disease to identify factors related to the risk of infection is also a key evidence base for planning future communication activities.

The strategy for communications in the health sector needs to be prepared with recognition of the current context of low-risk perception amongst different key target groups. Behaviour change communications need to be based on a clear rationale and incentives for target populations to change their behaviours and should identify and address factors that inhibit or encourage populations to change their behaviours.

Successful models should be replicated and scaled up. Novel models of communication such as use of mobile phones (SMS) will be considered for selected subpopulations as part of behavioural change projects and for risk communications during outbreaks.

The preventive health system down to the local level is a key element for the delivery of health sector messages to the general public and key target groups. The availability of sufficient human resources is still constrained, particularly in poor and isolated areas within the country. Communications materials are also required to support the efforts of local communicators within the preventive health system, the education system, the Viet Nam Red Cross, mass organizations, social organizations, etc.

A risk-based approach for targeting behaviour change communications will be adopted to reflect changing conditions for human risk from HPAI as MARD shifts to more sustainable control strategies, for example through revising the compulsory poultry vaccination program. This approach will also be of relevance when health and other sectors begin assessing Vietnam's agro-ecosystems for risks to people, animals and the environment in order to develop primary preventive measures.

Consideration should be given to the need for communications to both agriculture sector and health sector officials and workers and the general public on the ongoing risks of disease transmission within and between different livestock and wildlife species and humans and behaviours that can reduce these risks, applying a One Health approach.

Health managers from the central to local level require further training to improve risk communications during public health emergencies.

Training for public and particularly private health professionals on personal hygiene, infection control and personal protection, national communicable disease reporting requirements, the national pandemic plan and how they will receive information from the government during a pandemic is still required throughout the country.

Businesses and industry need support from the health sector to communicate best practice advice for protecting their workforce during a pandemic and maintaining essential services.

One of the challenges of the national response to the 2009 influenza H1N1 pandemic was that IEC materials took time to develop, approve and disseminate. Mechanisms for approval and dissemination can be planned in advance and some messages and materials can be drafted for quick adaptation when an event breaks (a dark website is one example of advance preparation for communication materials).

The operational communication structure described in the national pandemic influenza action plan needs testing during 2011-2015 to ensure coordination can be maintained from the central to the commune level during a severe pandemic.

D. CHALLENGES

THE CHALLENGES OF A STRATEGIC RESPONSE AND INTEGRATION

Sustaining the overall response and commitment at all levels. Competing priorities and a lessening of the focus on HPAI and pandemic preparedness over time in the mass media and general public contribute to challenges in sustaining national and international resources, political will and administrative commitment at all levels. Maintaining an appropriate level of activities and prioritization of available resources will be key issues for the coming period.

Surveillance/ information exchange within and between sectors and multi-disciplinary investigations of outbreaks. Inter-ministerial collaboration between MARD and MOH and between agriculture and health sector authorities at other levels must be continually strengthened so that relationships are strong, useful information exchanges are well timed, and joint responses are well managed. Legislation is being drafted to provide a framework for joint action but relations between sectors must also improve and structural changes may be necessary to advance collaborative action.

Laboratory diagnosis. Collaboration between human and animal health laboratories could offer advantages and efficiencies for specific activities such as the development of diagnostic reagents, guidelines on bio-safety, and training on laboratory techniques. Human health laboratories may be able to process animal or environmental specimens requiring a higher level of bio-security than is currently available in animal health laboratories.

Reducing reliance on poultry vaccination while maintaining disease control. Mass subsidized poultry vaccination was introduced during the previous period as a temporary measure to reduce circulation of the virus. As the national program begins to move beyond subsidized vaccination, it will be important to invest in communications to related sectors and the general public, and in active surveillance to detect increased risks of disease transmission in animals and humans and to implement appropriate measures if necessary.

Compensation policy. Compensation for culling of livestock aims to support the effectiveness of national passive surveillance system by removing disincentives for reporting disease outbreaks, and also provides a livelihoods support to affected producers. In order to be effective, compensation levels need to be adjusted relative to market rates, and provided in a timely manner.

Zoning and regional approaches. Administrative divisions at each level as well do not necessarily reflect ecological and other factors relevant to effective disease control. Regional divisions for provision of technical support to provinces differ between the agriculture and health sectors.

Communications and behaviour change. The current low risk perception of the public and key target groups is a key challenge for communication efforts. The impact of public awareness and behaviour change campaigns need to be evaluated. Lessons should not be limited to responding to influenza and emerging communicable diseases,

but should be considered for a wide range of health communications. Similarly, opportunities should be looked for to integrate health messages relevant to influenza in non-influenza activities.

Epidemiology field training. The appeal and sustainability of the FETP program is currently limited by a lack of academic and professional accreditation. These aspects need to be quickly solved so that the epidemiological capacity of the health sector can be suitably strengthened to respond to emerging infectious disease challenges. Human and animal health field epidemiology training provides an obvious starting point for developing common and joint approaches to managing outbreaks of infectious disease. This common, cooperative approach needs to be continued beyond training to become part of routine professional practice.

Socio-economic impacts. Continued attention to analyzing socio-economic impacts of HPAI or other emerging animal and human diseases as well as potential impacts of regulations and policies designed for control and prevention of these diseases. Socio-economic analyses should pay particular attention to gender-related dimensions, taking into account differences in the roles of women and men in livelihood activities, decision-making, care giving, access to information and economic resources, participation in local networks, exposure to risk and other related aspects.

Disaster management system. While there are advantages to having a specific structure to prepare and respond to pandemic influenza at the central level, many of the same people are involved in pandemic and disaster responses in provinces, districts and communes. The existing structures, networks, training and budgets including contingency funds available at these levels offer a sound framework for developing pandemic plans that could be better utilised.

Applying a One Heath approach. The combination of demographic shifts (i.e. the increase in in-country population density, as well as shifts in age distributions and from rural to urban), trade liberalization, and challenges in enforcing restrictions on legal and illegal wildlife trade, is leading to increased anthropogenic stress on already over-burdened regional ecosystems (including agro-, aquatic, forest, wetland, coastal, and urban ecosystems). The result is continued elevated risks to human health not only from zoonotic diseases, but also from a wide range of threats, including deterioration in water quality and air quality and ongoing loss of biodiversity. This is not only a public health issue, but also a social and economic issue. The ultimate cost of not confronting the intensifying pressures on Vietnam's ecosystems is the derailing of long-term socio-economic goals. In these situations, the immediate costs (in terms of losses in economic opportunity) of restricting practices that contribute to the degradation of ecosystem health will be more than offset by avoiding far more significant economic and social costs that would arise, should these situations be allowed to continue without restriction. Addressing agro-ecosystem health through a One Health approach requires the inclusion of new stakeholders (including forestry, wildlife conservation, wildlife farming, rural and urban land use planning agencies, etc.) and attention to an expanded set of indicators, including probably collection and analysis of new indicators of agro-ecosystem health.

Replicating and scaling-up pilot models. A range of pilot models have been trialled during the previous period and should be considered for wider application. Financial

resources for sustainable roll-out within the national system remains a key challenge, including the issue of incentives for local staff and collaborators.

Private agriculture sector partners. The engagement of commercial livestock producers and services providers, including input suppliers, traders and providers of private veterinary services in the implementation of the national program will be essential for long-term sustainability.

Private health sector. The involvement of the private health professionals in communicable disease surveillance through influenza activities is a first step toward greater integration in national health systems including registration, training, and regulation. Opportunities with the commercial sector particularly with regard to the production, procurement and distribution of medicines, vaccines and equipment are worth exploring to improve pandemic preparedness.

THE CHALLENGES OF DECENTRALIZATION

The decentralization process in Vietnam means that an increasing number of government decisions are made at lower levels in the administrative structure, and especially at the province level. Administrative units and service delivery units are being given the autonomy to design their own strategies and make their own spending choices. Resources and needs, however, differ significantly across provinces, districts, communes and villages, and the accountability of the service delivery units remains limited. In parallel with the decentralization, Vietnam is delegating substantial amounts of budget discretion to administrative and service delivery units. The latter cover a large and complex group of activities including, inter alia, hospitals and clinics and the agricultural extension services. These activities have in common an ability to raise some revenue on their own. Since 2004, spending units are free to reallocate resources across line items within each of four blocks of expenditures: wages and salaries, operations and maintenance, capital, and other costs.

Sub-national spending is funded through a combination of locally-raised revenues and transfers from the central budget. In the case of wealthier provinces, the transfer is actually to the central budget rather than from it. The determination of the amount of the net inter-provincial transfers in Vietnam is unique from an international perspective. The amount can be seen as the joint outcome of two mechanisms; the first determines the share of locally-raised government revenue each province can retain, and the second allocates an equalization grant from the state budget to each province. The resources directly available to each province are thus the sum of retained revenue and the equalization grant (if any) received from the central budget.

The objectives of this plan require policies and effective coordination of implementation of national and regional activities, for example in order to organize disease control and livestock production activities based on a limited number of ecological zones. Such activities may at times be difficult in a context of decentralized decision-making and uneven resources.

Likewise, the potential severity of social and economic costs of a human pandemic or serious emerging disease event point to the need for centralized decision-making (the

principle of "direct chain of command") in certain situations. Special measures would be justified in an emergency context to assist the provinces to mobilize and access financial resources and to take responsibility for the implementation of their local preparedness strategies within an overall national response.

HUMAN RESOURCE CHALLENGES

General human resource shortages affect both the curative and preventive sectors for human health, and in the animal health and livestock production sectors. The high turnover of staff within the preventive sector particularly at provincial and lower levels is an added challenge. The development of a large tropical medicine hospital in Hanoi could temporarily add to human resource shortages in the curative sector. Incentives for staff and local collaborators are a key issue for both the health and agriculture sectors.

Health professionals with specialist knowledge are also required – for instance, infection control experts are needed in hospitals, and the performance of both health facilities and preventive health units would benefit from having staff with applied epidemiology skills.

Ensuring a competent, nationally accredited private health workforce is a longer-term test for the Vietnamese health sector.

It is necessary to develop a workforce in the health, agriculture and other related sectors who understand agro-ecosystem health concepts and can design and implement programs to address the upstream determinants of human and animal health. This includes enhancing the capacity of human resources within veterinary services on wildlife health.

Attention should also be paid to gender balance in the development of national human resources at all levels, including through monitoring of training data that is disaggregated by gender.

E. MONITORING AND EVALUATION

PURPOSE, ROLES AND RESPONSIBILITIES

As with the OPI during the period 2006-2010, a key principle of the overall national program for 2011-2015 is that implementing agencies will be responsible for specific monitoring and evaluation of the program and project activities they undertake. Both national programs and projects in the key sectors as well as specific ODA-supported activities should allocate adequate resources and advance planning to ensure effective collection and analysis of data and reporting of monitoring and evaluation results to both decision-makers and implementers at all levels.

Overall monitoring and evaluation of the national integrated program for 2011-2015 is expected to capture and summarize key information from this ongoing detailed monitoring and evaluation of each national and ODA program and project, in order to provide necessary information on overall implementation progress and impact on a regular basis to national decision-makers, alerting them to actual or potential problems in implementation so that adjustments can be made, help determine whether the relevant stakeholders are responding as expected and intended, and provide a process whereby the coordinating and executing agencies can further improve the effectiveness of their activities.

Overall monitoring and evaluation of the national integrated program will be done against the overall objectives of the program, based on key impact indicators, as well as a set of specific indicators for each sector. Progress will be also be tracked over the five year implementation period of the plan against a series of annual milestones for key outputs.

The National Steering Committee on Avian Influenza Prevention and Control will be responsible for overall monitoring and evaluation of the program on behalf of the Government of Vietnam. The National Steering Committee for Human Influenza Pandemic Prevention and Control will also monitor specific indicators for the health sector and for pandemic preparedness and response. The Plenary Meetings of the PAHI Partnership will also provide a key forum for overall joint monitoring of progress by national and international partners and discussion of key lessons, emerging issues, overall policy directions and resource requirements.

At the component level, MARD will be responsible for monitoring and evaluation of Component II and MOH will be responsible for monitoring and evaluation of Component III. Monitoring and evaluation activities will be carried out by the regular staff of each sector, with capacity development and technical assistance provided where necessary. In some cases, contracting out of specific monitoring and evaluation functions to specialized agencies and institutes may be appropriate. Individual projects and programs are responsible for specific monitoring and evaluation of their own activities.

Key monitoring and evaluation reports prepared by MARD, MOH and by specific projects implementing specific activities within the framework of the overall plan

should be made available to the National Steering Committees and maintained in a database to be developed by the PAHI Secretariat.

Overall financial commitments as well as financial progress reports for each sector and for specific activities should also be shared with PAHI Secretariat for the preparation of consolidated monitoring of the program.

Annual, mid-term and final reviews will be taken in each sector, with the results reported to the NSCAI and NSCHP. Annual, mid-term and final meetings of the Partnership will also be organized to present the results of these reviews, discuss overall progress and identify necessary adjustments and specific support needs.

OVERALL OBJECTIVES AND INDICATORS OF THE PROGRAM

Overarching Objective

The overarching objective of the integrated national operational program for 2011 to 2015 is to reduce the risk to humans and animals from avian influenza A(H5N1) and other emerging infectious diseases by:

- controlling infectious diseases at source and implementing appropriate measures to prevent disease emergence/re-emergence;
- detecting and responding rapidly and appropriately to cases of new and emerging high impact diseases in both animals and humans;
- enhancing preparations for the health and non-health consequences of any severe pandemic disease of humans.

Key Overall Indicators

The key indicators for success in terms of the overall impact of the program on achieving the program objectives with regard to HPAI and other emerging diseases in animals and humans by 2015 are as follows:

1. Halving the 3 year rolling average of locally acquired human cases of influenza A(H5N1) per annum by 2015, with no cases in poultry in disease-free compartments[12].
2. Halving the ongoing rolling average of H5N1 virus-positive poultry/environmental swabs in sentinel markets and slaughterhouses (this requires an on-going, regular, standardised surveillance program in these sites so that gains can be measured).
3. Time from field reporting to diagnosis and implementation of appropriate action for any suspected HPAI case is a maximum of 72 hours, for other known emerging diseases in livestock and wild life is a maximum of 14 days, and for any new disease is 30 days (allowing time for diagnosis of a new disease and if necessary the submission of samples to overseas reference laboratories).

[12] human cases are an independent indicator of success in controlling the disease in the agriculture sector at present)

The number of human cases is an independent indicator of the level of circulation of virus as long as the disease remains zoonotic. Clearly, if a change occurs and the virus becomes more readily transmissible from poultry to humans or between humans then this measure is no longer applicable.

One potential challenge with this indicator is that few human cases are occurring each year. Nevertheless a reduction in human cases from the current equilibrium of about 7 cases per annum would be a sign of reduced virus circulation in poultry and therefore an indicator of success of control measures in this sector. Using a rolling average reduces the effects of seasonal/annual variations.

For measurement of avian cases in markets it will be necessary to adhere to strictly standardised methods used both in the field and laboratory if this measure is to be of benefit in measuring improvements over time.

Time from field reporting to diagnosis and response for HPAI and other EIDs provides a measure of the sensitivity and responsiveness reflecting the impact of the investments in capacity development and awareness in different parts of the national system during the previous period and the period of the current plan for 2011-2015.

List of Indicators by Sector

The following list of sectoral indicators has been identified based on the pilot implementation of the National Monitoring and Evaluation Framework developed under the previous period 2006-2010, as established in Decision No. 177/QD-BNN-HTQT of the Minister of Agriculture and Rural Development and Chair of the National Steering Committee for Avian Influenza Prevention and Control dated 21 January 2010. This list of indicators has been reviewed and revised based on the experience of the pilot implementation in 2010.

Agriculture Sector

1. Number of HPAI outbreaks during the reporting period. As relevant, this indicator could also cover outbreaks of other zoonotic disease threats in livestock and wildlife.
2. Proportion of targeted poultry flocks that have been vaccinated (this indicator will depend on what, if any, official targets for vaccination are in place during the reporting period).
3. Number of samples processed by central and regional laboratories compared to national testing targets during the reporting period.
4. Number of veterinary laboratories certified as meeting ISO 10725 standard.
5. Proportion of designated veterinary laboratories passing proficiency tests per year.
6. Mean and median number of days from onset of a suspected HPAI outbreak in poultry to the sending of specimens to the laboratory for testing. Over time, routine tracking could be put in place for testing of all suspected animal outbreaks (livestock and wildlife).

7. Mean and median number of hours between receipt of animal biological specimens for HPAI testing and sending of the results to requestors. Over time, this could be expanded beyond HPAI.
8. Proportion of specimens collected and submitted to the designated surveillance agency within the last 6 months among planned number of specimens.
9. Proportion of sub-DAH submitting the monthly periodic report (paper) on time, including zero reporting, for each month during the reporting period.
10. Proportion of reports on suspected outbreaks of HPAI submitted according to the standard operating procedures.
11. Proportion of outbreaks entered into TADInfo. Over time, this indicator could be extended beyond HPAI to cover any other identified high-risk disease outbreaks.
12. Proportion of suspected HPAI outbreaks with response in accordance with GVN SOPs.
13. Proportion of investigations led by all levels of animal health (DAH and sub-DAHs) in which the health sector was invited to participate and joined the investigation.
14. Mean and median number of days from first declaration of an HPAI outbreak to the declaration of the end of the outbreak.
15. Proportion of vaccinated flocks in the testing sample showing adequate level of protection based on post-vaccination sero-surveillance (this indicator depends on the vaccination policy in place during the reporting period).
16. Number of animals culled.
17. Volume of illegal poultry products seized by market management. Over time, consideration should be given to expanding this indicator to cover other livestock and commercially-farmed wildlife.
18. Proportion of provinces with a poultry production plan. Over time, this indicator could be expanded to cover the provincial livestock production plan.
19. Existence of approved good practice guidelines and standards for poultry production and the market chain. Over time, this could be extended to cover other livestock and commercially-farmed wildlife species.
20. Number of heads of poultry going through official slaughterhouses. Over time, consideration should be given to expanding this indicator to cover other livestock and commercially-farmed wildlife.

Health sector

1. National Preparedness Plan in Response to Avian Flu Epidemic H5N1 and Human Influenza Pandemic reviewed and updated within the last 12 months. Consideration could be given to expanding this plan to cover other communicable diseases at risk of causing a serious pandemic.
2. Proportion of designated ministries and mass organizations that have approved plans for pandemic preparedness and response.

3. National pandemic preparedness and response plan tested within the last 12 months.
4. Proportion of designated ministries and mass organizations that have tested their plans for pandemic preparedness and response within the last 12 months.
5. Proportion of provinces that have tested their pandemic preparedness and response plan within the last 12 months.
6. Number of confirmed cases of human infection with a novel influenza virus subtype (including H5N1).
7. Number of human fatalities from confirmed human infection with a novel influenza virus subtype (including H5N1).
8. Case fatality ratio of confirmed human infection with H5N1 virus.
9. Number of clusters of human infection with a novel influenza virus subtype (including H5N1).
10. Mean and median number of hours between submission of specimens for confirmatory testing and sending of results to the requester.
11. Proportion of investigations of human infection with H5N1 led by preventive medicine (at all levels) in which DAH (at the appropriate level) was invited to participate and joined the investigation.
12. Proportion of confirmed cases of human infection with H5N1 where the investigation form for suspected cases of influenza A (H5N1) was completed.
13. Proportion of laboratories able to detect human infection with H5N1 virus passing proficiency tests per year.
14. Proportion of central, regional, and provincial treatment facilities that have an operational plan for pandemic influenza. Over time this indicator could be expanded to cover serious pandemic threats other than influenza as well.
15. Proportion of central, regional, and provincial health care facilities with a functioning Infection Control Committee (Board) and a designated Infection Control Officer.
16. Proportion of district-level health care facilities that have an assigned Infection Control Department (Team) and Officer
17. Number and proportion of healthcare facilities of Grade 2 or higher that have a standardized isolation facility or ward/room.
18. Mean and median number of hours between onset of symptoms and commencement of antiviral therapy for confirmed cases of human infection with H5N1 virus.

Financial Monitoring

Total financial resources committed to support implementation of the Integrated National Operational Program for 2011-2015, reported based on source of funds (national resources from State budget, international ODA, etc.).

One Health approach

Further specific indicators related to the application of a One Health approach should be developed as work proceeds at both the international and national levels to further define this approach and its practical application at the national level.

PATHWAYS AND MILESTONES FOR KEY ACTIVITIES

Milestones have been established for key activities in each sector to facilitate monitoring and evaluation of progress towards key goals and outputs of the sector throughout the five years of implementation of the program (see Annex III below). The identified milestones for each activity provide a clear and detailed picture of the expected sequence of steps and indicators for systematic achievements over time.

F. FINANCIAL MANAGEMENT AND ESTIMATED BUDGET

FINANCIAL MANAGEMENT

Substantial financial resources have been invested in combating avian and human influenza in Vietnam. The OPI had a total cost estimate of US$ 250 million for core activities to be implemented in the period 2006-2010. As of December 2009, the funding matrix maintained by the PAHI Secretariat included a total of around $201 million committed by the Government of Vietnam and ODA partners, including approximately $70 million from Government and $132 million from ODA sources. The total delivery achieved as of December 2009 was $140 million (equivalent to 56% of the total committed funds), including $85 million of Government of Vietnam resources and $55 million of ODA funds. Significant further progress on delivery was achieved in 2010.

Many donors are now adjusting their focus from 'emergency' investments to combat avian and human influenza to other development issues including addressing other priority communicable diseases. Vietnam is also undergoing a transition in ODA support related to achieving middle-income country status, and some adjustments in ODA budgets may also result from global financial adjustments and other issues. This means that the total pool of ODA financing in 2011-2015 that is specific for avian and human influenza is likely to be less than was available during 2006-2010. This may be partially offset by recognising and prioritising activities that have benefit in improving the health system's capacity to respond to a range of infectious diseases, and by identifying enabling factors for private sector investments in veterinary services and livestock production that support the overall objectives of this plan.

Nonetheless, HPAI persists in Vietnam demanding continued vigilance and investment to sustain control efforts and prevent further spread. There is a need to continue strengthening veterinary services and livestock development, with a focus on overall capacity development for new and emerging diseases, and to broaden the animal health focus to address wildlife species as well.

Similarly, gaps remain in pandemic preparedness planning and the ability of the Government to counter a more severe pandemic than seen in 2009 or to respond to multiple simultaneous public health threats. Funds are required to consolidate and expand on the work done during the OPI 2006-2010 on pandemic preparedness and consideration should also be given to establishing contingency funds for pandemic response.

Beyond advancing national response and mitigation competencies, a comprehensive approach calls for financing an upstream preventive strategy focused on assessing and addressing the risks for future epidemics and pandemics posed by agro-ecosystems to complement the downstream mitigation strategies. This reflects the transition to a longer-term preventive strategy as an essential cost-effective pillar to managing emerging diseases. This will require a budget to widen the coordination mechanism to incorporate a broader range of stakeholders and the establishment of a systematic monitoring program.

Description of existing and potential sources of funds

1. Government budget

Recurrent financing and capacity building investments will be required during the period 2011-2015, as part of the ongoing state budget funding cycles at central and provincial levels. These investments form part of the overall financing in line with the overall national 5-year Socio-Economic Development Plan (SEDP) and key sector financing strategies as reflected in the overall 5-year plans 2011-2015 for the agriculture and health sectors, and related, more detailed, plans of specific technical departments within these sectors. This funding will form the national input to this plan, as overall counterpart funding to the ODA support that is requested from international partners.

Emergency funding and related specific financial inputs would be considered based on the developing situation in the country or globally. Consideration should be given in the coming period to reviewing the financing mechanisms for emerging infectious diseases in humans and animals, based on the experience of SARS, avian influenza and pandemic (H1N1) 2009 to ensure that resources can be rapidly and efficiently applied for emergency containment and mitigation activities.

2. ODA support

As noted above, the Hanoi Declaration from IMCAPI 2010 emphasizes the need for ongoing international support. During the coming period, international support is expected to take the forms of:

- *Direct bilateral financing and technical assistance*: the US Government is currently the key bilateral donor with ongoing bilateral support activities that will contribute to the new plan for 2011-2015. USAID is supporting activities on avian influenza as well as emerging pandemic threats, with assistance mainly channelled through UN technical agencies as well as international non-governmental organizations and private sector contractors. US CDC has ongoing and planned cooperative agreements covering avian influenza analysis (NIHE), routine surveillance of seasonal influenza (NIHE) and zoonotic diseases (MOH and MARD). Other bilateral donors are supporting a range of ongoing activities related directly or indirectly to the objectives of this plan, and further support is requested from bilateral donors in future.
- *Multilateral assistance*: the key direct multilateral channels for support to this plan are expected to include the additional financing comprising a further International Development Assistance (IDA) credit as well as non-refundable assistance from the AHI Facility for the World Bank-administered VAHIP Programme for the period 2011-2014, and the continuation of coordinated UN System support beyond the Government-UN Joint Programme on Avian Influenza, which is expected to be a component of the new One Plan 3 of the UN System in Vietnam. Other related multilateral support channels include the World-Bank administered Livestock Competitiveness and Food Safety (LIFSAP)

program as well as ongoing ADB health sector support for communicable diseases with a focus on cross-border and sub-regional surveillance and disease control mechanisms.

- *Regional cooperation and assistance*: Vietnam is an active participant in a wide range of intergovernmental bodies, international networks and regional programs related to the objectives of this plan, including ASEAN, APEC, the WHO Asia-Pacific Strategy for Emerging Diseases (APSED), the FAO Emergency Centre for Transboundary Animal Diseases (ECTAD), and others.

ESTIMATED BUDGET BY COMPONENT AND PROPOSED FUNDING SOURCE

The total cost of implementing the AIPED program for the period 2011-2015 has been estimated during the development of the plan, as outlined below. Costs for the agriculture sector (Component II) reflect the proposed plans and estimates prepared by relevant technical departments within MARD. Costs for the health sector (Component III) are based on proposed plans and estimates developed by the four subcommittees on Surveillance, Treatment, Logistics and Communications established under the National Steering Committee for Human Influenza Pandemic Prevention and Control (NSCHP). In order to clarify and strengthen the sectoral management and monitoring of the funds, most items are included under these two sectoral components, with only a small number of activities costed under overall coordination (Component I).

Estimated Budget by Component and Proposed Funding Source, 2011-2015 (Million VND)

No.	ACTIVITY	Government of Vietnam	ODA	TOTAL BUDGET
	COMPONENT I – Enhanced Coordination Activities			
1.1	Overall Central Coordination of the Program	2,100.0	1,050.0	3,150.0
1.2	Overall Provincial Coordination of the Program	1,365.0	210.0	1,575.0
1.3	Support to Donor Coordination	1,008.0	16,800.0	17,808.0
1.4	Overall Program Monitoring and Evaluation	1,050.0	17,850.0	18,900.0
1.5	Support for Regional Coordination	0.0	3,150.0	3,150.0
	Component I TOTAL	**5,523.0**	**39,060.0**	**44,583.0**
	COMPONENT II - HPAI control and eradication and strategy for emerging infectious diseases in the Agricultural Sector			
2.1	Strengthening veterinary and animal production services	1,021,807.5	862,735.5	1,884,183.0
2.2	Disease control and prevention	1,315,240.5	556,069.5	1,871,310.0
2.3	Surveillance and epidemiological investigations	24,150.0	166,635.0	190,785.0
2.4	Modifications to the livestock sector	0.0	136,080.0	136,080.0
2.5	Public awareness and behavioural change	8,211.0	77,364.0	8,575.0
	Component II TOTAL	**2,369,409.0**	**1,788,524.0**	**4,167,933.0**
	COMPONENT III - Pandemic Preparedness and influenza and emerging infectious disease prevention in the Health Sector			
3.1	Improving capacity of the surveillance and response system from central to local level	299,948.3	1,557,078.6	1,857,026.9
3.2	Improving treatment capacity of provincial and district hospitals	290,850.0	159,600.0	450,450.0
3.3	Strengthening capacity of the local preventive medicine system	504,000.0	504,000.0	1,008,000.0
3.4	Strengthening behaviour change communication	62,685.0	62,685.0	125,370.0
3.5	Strengthening coordination	120,750.0	22,050.0	142,800.0
3.6	Other activities	136,500.0	136,500.0	273,000.0
	Component III TOTAL	**1,414,733.3**	**2,441,913.6**	**3,856,646.9**
	OVERALL TOTAL 2011-2015	**3,789,655.3**	**4,279,497.6**	**8,069,662.9**

Estimated Budget by Component and Proposed Funding Source, 2011-2015 (USD)

(Exchange rate: 1 USD = 21,000 VND)

No.	ACTIVITY	Government of Vietnam	ODA	TOTAL BUDGET
	COMPONENT I – Enhanced Coordination Activities			
1.1	Overall Central Coordination of the Program	100,000	50,000	150,000
1.2	Overall Provincial Coordination of the Program	65,000	10,000	75,000
1.3	Support to Donor Coordination	48,000	800,000	848,000
1.4	Overall Program Monitoring and Evaluation	50,000	850,000	900,000
1.5	Support for Regional Coordination		150,000	150,000
	Component I TOTAL	**263,000**	**1,860,000**	**2,123,000**
	COMPONENT II - HPAI control and eradication and strategy for emerging infectious diseases in the Agricultural Sector			
2.1	Strengthening veterinary and animal production services	48,657,500	41,065,500	89,723,000
2.2	Disease control and prevention	62,630,500	26,479,500	89,110,000
2.3	Surveillance and epidemiological investigations	1,150,000	7,935,000	9,085,000
2.4	Modifications to the livestock sector		6,480,000	6,480,000
2.5	Public awareness and behavioural change	391,000	3,468,000	4,075,000
	Component II TOTAL	**112,813,000**	**85,644,000**	**198,473,000**
	COMPONENT III - Pandemic Preparedness and influenza and emerging infectious disease prevention in the Health Sector			
3.1	Improving capacity of the surveillance and response system from central to local level	14,283,250	74,146,600	88,429,850
3.2	Improving treatment capacity of provincial and district hospitals	13,850,000	7,600,000	21,450,000
3.3	Strengthening capacity of the local preventive medicine system	24,000,000	24,000,000	48,000,000
3.4	Strengthening behaviour change communication	2,985,000	2,985,000	5,970,000
3.5	Strengthening coordination	5,750,000	1,050,000	6,800,000
3.6	Other activities	6,500,000	6,500,000	13,000,000
	Component III TOTAL	**67,368,250**	**116,281,600**	**183,649,850**
	OVERALL TOTAL 2011-2015	**180,460,250**	**203,785,600**	**383,745,850**

As part of the process of cost estimation, an indication of the expected source of funds from national resources under the State Budget and from Official Development Assistance (ODA) has also been estimated. This reflects the importance of these investments in Vietnam as contributing to a global good in terms of disease prevention and control and macro-economic stability, and also reflects the ongoing need for international support for activities beyond the capacity of the national system and internal resources. Separate investments from the private sector for example for development of commercial poultry during the period 2011-2015 are not included here.

The total cost for implementation of the plan over the period 2011-2015 is estimated at 8,069 billion VND (equivalent to 384 million USD).

This total cost estimate includes 44.58 billion VND (equivalent to 2.1 million USD) for Component I on Enhanced Coordination Activities (approximately 1 percent of the total costing), 4,168 billion VND (equivalent to 198.5 million USD) for Component II on the HPAI control and eradication and strategy for emerging infectious diseases in the Agriculture Sector (approximately 52 percent of the total costing), and 3,857 billion VND (equivalent to 183.6 million USD) for Component III on pandemic preparedness and influenza and emerging infectious disease prevention in the Health Sector (approximately 48 percent of the total costing).

Based on the proposals of the two ministries, it is estimated that 3,789 billion VND (equivalent to 180.5 million USD) would come from State budget resources (47 percent of the total costing) and 4,279 billion VND (equivalent to 203.8 million USD) would come from ODA (53 percent of the total costing).

Detailed cost tables are provided at Annex IV.

ANNEXES

ANNEX I LESSONS LEARNED DURING THE PERIOD 2006-2010

Many important lessons have been learned in Vietnam in the past 5 years as a result of experiences dealing with avian and H1N1 pandemic influenza. Formal reviews of programs conducted since 2006 and recent reflections by MOH and MARD on the local experience of responding to H5N1 HPAI and influenza A/H1N1 provide a number of important lessons for the design of the national plan for 2011-2015.

General lessons learned including lessons on coordination

Political commitment and leadership have been essential in progressively addressing HPAI and in rapidly preparing Vietnam for a pandemic.

Donor support and coordination for the Vietnam response to HPAI and pandemic influenza remains critical.

A number of system constraints have been exposed by the emergence of HPAI and H1N1 and warrant careful consideration for improvements in the system. While there have been tremendous gains, achieving effective collaborations between human and animal health sectors remains an ongoing challenge requiring long-term commitment at all levels. Examples of successful coordination and collaboration should be identified and applied and should encompass surveillance and information sharing, joint field investigations, sharing of laboratory resources, linked applied epidemiology training and cooperative research. To move to a more integrated and needs-based approach to addressing emerging communicable disease threats calls for prioritisation of threats, health system responses and research at national and sub-national levels.

Early recognition and response to new emerging infectious diseases are crucial to reduce the risk of these diseases becoming widespread. However, once emerging diseases become widespread and endemic, a different approach to control is required that focuses on minimising the effect of the disease and a phased approach towards elimination (if in fact elimination is feasible).

Timeliness of international reporting of notifiable human and animal health events is a key feature of a successful national response. Vietnam has worked closely with WHO, OIE and other partners to ensure transparency and to fulfil its obligations under international agreements. These achievements have been crucial to allow local and international stakeholders to comprehend the extent of H5N1 infection in Vietnam and the measures being taken to control and prevent the disease - they need to be sustained. Both internal and external (international) reporting are contingent on the timely flow of information from localities to central level, and the timely receipt and processing of specimens by (reference) laboratories with confirmatory testing capacity.

Vietnam and neighbouring countries remain at risk of introduction of new strains of H5N1 HPAI virus. This situation will persist until such time as H5N1 HPAI viruses are eliminated from poultry in the broader region. This principle also applies to other important transboundary diseases affecting humans and animals and requires a regional approach for control of these diseases.

Avian influenza caused by viruses of the H5N1 subtype is not expected to be eliminated from Vietnam in the next five years. This is due largely to the structure and nature of the poultry sector, and the quality and availability of services for the support of the livestock sector including veterinary and animal production services (and other ancillary services).

The linked system of national steering committees should be reviewed and their scope expanded to address other emerging diseases in humans and animals. Sustaining national political commitment and maintaining key coordination mechanisms including the National Steering Committee for Avian Influenza Prevention and Control (NSCAI) and the National Steering Committee for Human Pandemic Prevention and Control (NSCHP) has been a key achievement over the past seven years. These committees have also addressed emerging issues, including livestock diseases (PRRS and FMD) and the pandemic (H1N1) 2009. Taking into account ongoing emerging infectious disease risks in wildlife, livestock and humans and their potential broad impacts, the mandates and membership of these two committees should be reviewed with consideration given to establishing permanent national coordination mechanisms for emerging infectious diseases in humans, livestock and wildlife that encompass zoonotic and pandemic disease threats.

Effective collaborations - which may consist of formal linkages with other national coordination and regulatory authorities - need to also be expanded to include other relevant sectors such as environment, wildlife, and essential services (energy, telecommunications, finance and banking, law and public security, public utilities, transportation). This is important for a truly transdisciplinary approach to preventing and managing communicable diseases, and for the development of comprehensive emergency response plans for pandemics (and other hazards). With regard to pandemic planning, continued operation of essential health and non-health functions is contingent on integrating emergency plans from a range of sectors, both public and private. Relevant public sectors would include the Ministry of Industry and Trade, Viet Nam Electricity, Ministry of Agriculture and Rural Development, Ministry of Industry and Trade, Ministry of Health, Ministry of Information and Communication, Ministry of Finance, State bank of Viet Nam, Ministry of Justice, Ministry of Public Security, Ministry of Labour, Invalid and Social Affairs, Ministry of Natural Resources and Environment, Ministry of Transportation.

The Partnership on Avian and Human Influenza (PAHI) has proved an effective bridge between national and international partners. The Partnership should continue with a revised scope suitable to the new plan. PAHI has provided an important coordination function for national and international, bringing together 26 signatories and other stakeholders and supporting coordination, information sharing, overall monitoring and key reviews, strategic discussions and working meetings in support of the OPI. The new plan is expected to have a smaller and more focused group of international partners, and to move beyond a single virus focus with the application of a One Health approach. Consideration should be given to revising the Partnership name, scope and membership to reflect the new plan.

Lessons learned in the animal health sector

It will be a number of years before veterinary services (public and private) achieve international quality standards in all areas. Focus should be directed to strengthening priority areas such as the capacity to investigate, diagnose and control emerging infectious diseases. Greater investment in undergraduate training of veterinarians in public health, disease diagnosis, risk assessment and epidemiology is essential to ensure future veterinarians have the knowledge and skills to handle emerging and highly pathogenic diseases. Veterinary laboratories do not have specialist case managers or specialist pathologists. These specialists are required to improve the value of veterinary diagnostic testing and investigations. New veterinary legislation is being prepared and must be backed by enforcement.

Demand will increase for high quality veterinary and animal production services to support the expanding livestock sector and to control and prevent important diseases. To meet these demands, Government animal production and extension services also require long-term support to build capacity and to improve links with animal health services.

Livestock disease control and prevention is a shared responsibility between government and the private sector. The private sector will be the main investor in livestock enterprises and will need to be closely engaged by government, or involved in public private partnerships, to ensure that it manages the risk of disease and informs government of any disease outbreaks. This will be aided if stronger industry associations emerge.

Increased demand for livestock products by consumers will result in an increase movement of livestock and livestock products across land borders. Not all of this movement will comply with existing laws, requiring strengthening of border controls and exploration of other methods aimed at reducing negative effects of cross border trade.

The focus on avian influenza during the previous period has to some extent come at the expense of work on other important diseases of animals. Other important diseases that have received less attention because of the demands placed on veterinary services by avian influenza include foot-and-mouth disease, PRRS and rabies.

Zonal approaches to avian influenza control based on agro-ecological conditions have been promoted and used successfully (such as differences in vaccination policy) given the marked differences in agro-ecology between parts of the country and demonstrated by the restricted crossover of viruses between the north and south of the country. The use of zones should be considered when moving towards disease elimination but the difficulties associated with zonal elimination should not be underestimated. The absence of geographical features that could act as natural boundaries between some zones is one of the factors that will make elimination programs based on zones difficult to implement. Control programs should exploit geographical features that provide for separation of poultry populations between zones or that create points where movement controls can be implemented effectively (e.g. Borders between zones with a limited number of transportation corridors between zones).

Improved surveillance, disease investigations and genetic analysis of viruses are essential to understand the relationships between different virus isolates and the epidemiology of the disease. Training and SOPs developed for investigations are a step in the right direction. Local ownership of surveillance plans by provincial authorities is crucial (i.e. results must help to answer important local questions). Support for veterinary surveillance and epidemiology from donors will be required for a number of years. This support is required to ensure that sufficient laboratory testing from active and passive surveillance can continue for avian influenza and other important diseases to build improved knowledge of these diseases. Joint animal health/human health investigations should be conducted wherever possible for confirmed avian and human cases.

Environmental and other costs of livestock production, especially large industrialised units, need to be considered and the effects mitigated. All new or enlarged farms should have appropriate waste treatment facilities that prevent discharge of untreated waste.

Industrialised poultry farms will pose a different set of public health threats to those from small farms. The threat of introduction of pathogens to industrialised farms will be reduced if appropriate biosecurity systems are implemented. However, once a pathogen gains entry to a large farm it can spread rapidly within the farm, especially if the animals have no immunity to the agent. Onward transmission is possible because of the high concentration of the pathogen produced and the large volumes of products and waste that leave the farm (unless appropriate measures are taken). The limited land available in Vietnam could potentially result in overcrowding of livestock farms, increasing the risk of disease transmission and environmental pollution, if the process is not managed properly. Animals in new and enlarged farms need to be reared in a manner that minimises the risk of infection with pathogens through improved farm biosecurity measures covering both entry of pathogens (bioexclusion) and onward transmission (biocontainment). Existing diseases, such as avian influenza, Newcastle disease, porcine reproductive and respiratory syndrome (PRRS) and hog cholera that threaten the viability of livestock producers and others in the livestock supply chain need to be better controlled if the full potential of the livestock sector is to be attained. Farm workers can act as a bridge for transmission of pathogens such as influenza viruses from large farms to the community and from the community to farms. Appropriate measures need to be developed to minimise and manage these risks. The minimal biosecurity measures in place on the vast majority of poultry farms in Vietnam will not prevent incursions of influenza viruses if the viruses are circulating in the area.

High-end industrial farms implement measures aimed at excluding certain pathogens. However for most other farmers the biosecurity measures to reduce the risk of virus incursion to very low levels are not economically viable or cannot be implemented without changing the nature of the production system. (E.g. free grazing ducks). An understanding of poultry 'market value chains' and the motivations of the various actors in these chains are crucial when developing control and eradication programs.

The drivers of livestock sector development must be understood and expansion planned and regulated properly to prevent emergence of new problems or re-emergence of existing diseases and environmental hazards. The number of industrialised livestock farms in Vietnam is still relatively small providing an opportunity for government to work with the private sector to build livestock production and regulatory systems that minimise

potential public health and environmental risks associated with intensification. Livestock should be reared in a manner that does not increase the risk of generation of antimicrobial resistant pathogens through better disease preventive measures such as enhanced farm biosecurity and vaccinations and improved control over use of antimicrobial drugs. Demand for live poultry sales has fallen in some parts of the country reducing the size and relevance of live poultry markets. This change has probably helped to reduce the spread of avian influenza viruses and other pathogens that spread in places where animals from different sources congregate, and will help to protect human health. Nevertheless, even if the number is reduced, many poultry will still be sold through live poultry markets. Better disease preventive measures and traceability are required for all markets, especially for large wholesale markets. With a rapidly modernizing livestock industry, the role of the government in regulating externalities becomes increasingly important. At the same time, its role in financing construction of facilities is reduced as the private sector takes over. Public-private partnerships have the potential to allow orderly growth of the sector.

The risk for emergence of infectious disease sourced from wildlife species has been recognised, however functions and responsibilities of state management agencies need further clarification and the capacity of veterinary services on investigate and respond to diseases in wildlife as well as the capacity of other sectors, for example to manage commercial wildlife farming, needs to be developed. Training in veterinary management of wildlife and wildlife diseases should be provided for both existing veterinary services and undergraduate veterinary students. Improving the general capacity of veterinary laboratories to investigate unknown diseases will assist greatly in the ability to diagnose emerging diseases in wildlife. The ability to identify disease outbreaks and manage health in wild animal populations will be enhanced with improved communication between the animal health sector and the wildlife management sectors of MARD.

Lessons learned in the Human Health sector

Professional leadership across all departments of the health sector has been a key enabler in the success of developing and implementing national plans and in advancing legislation to improve prevention and control of communicable diseases. Reliable communications between the curative and preventive departments needs to be secured and prioritisation of responses across the entire health sector is required for optimal health system strengthening.

From provinces down, lower levels of the health system require further strengthening. The regulatory and institutional reforms that flow from higher-level plans, legislation and directives need to be implemented to improve the functioning of provincial, district and commune health systems. For instance, guidelines on diagnosis and management have yet to be made fully operational and some laws and circulars have not been uniformly adopted across the country. Timely use of collected information including surveillance data reflects on features of the system such as technical skills required to process data and managerial and operational capacities to act on information. National preparedness is only as sound as the weakest link in provincial and community preparedness. Strengthening these lower components of the health system also requires consideration by the central level of lessons learned at community, district and provincial levels. For

example, some provincial budgets may be inadequate to carry out all activities required to ensure overall national preparedness.

Issues of staff recruitment, retention and training limit the capacity of the preventive medicine system. To a lesser extent, these are also features of the curative health sector.

The capacity to respond to large-scale events and multiple, simultaneous public health threats would be improved with further integration of parallel systems for addressing natural disasters and pandemics at provincial levels and below.

Pandemic preparedness planning within (and beyond) the health sector has focused on health issues with operational continuity aspects yet to be strengthened and tested. Links with essential services are required to ensure the health sector can adequately plan for the demands imposed on it with a pandemic (or disasters caused by other events). Plans need to be tested through simulations (as below) or real events with suitable review of performance.

Simulation exercises have proved important in mobilising authorities, the health sector and communities. However, multi-sectoral exercises are required at district and provincial levels to ensure alignment of pandemic plans, and maintenance of essential services.

Evaluation of efforts across the full range of responses is required to assess effectiveness and improve future planning. While there have been a number of reviews of donor supported programs (many of which are coming to an end in 2010-2011), there has been only limited reflection on key elements of the disaster-driven response (for instance, there has yet to be a detailed evaluation of the response to influenza A/H1N1). There remains a large volume of information to be validated, synthesized and translated into policies and programs - evaluations of policies, legislation, resource allocation, health facility improvements and procurement of new equipment, collaborations and partnerships, communications and social marketing, community development, education and training, and service delivery are all required.

A culture of reflection after action - documenting what worked and what didn't work - should be promoted at all levels of the health system so that health managers have the necessary information to improve planning, preparedness, response and mitigation measures. Mechanisms need to be established to transform information into policies and action plans. This notion of an active learning system should be extended beyond the health sector to include all stakeholders listed in the national action plan for pandemic influenza such as other Ministries, the Vietnam Red Cross and various unions.

Flexibility is needed in responses to HPAI, pandemic influenza and emerging infectious diseases. This has been seen in the animal health sector with the gradual adoption of a longer-term approach to addressing avian influenza in poultry. This has consequences for the risk of disease in people that the human health sector needs to be aware of and attend to in moving from emergency responses to risk-based approaches to tackle vulnerabilities. Flexibility has also been important in the national response to influenza A/H1N1 - responses must be adapted to the evolution of the local epidemic in a timely fashion. This includes consideration of the severity of the disease and the impact of

public health actions. Vietnam's pandemic action plan outlines a single third phase when an epidemic has spread or is spreading with human-to-human transmission. In contrast, many other countries have more specific phased responses providing guidance on when to adjust activities in response to the degree of spread and the severity of the disease.

Lessons learned relevant to both animal and human health sectors

Human health is connected to the health of animals and to the health of ecosystems. These interdependencies underscore the need to harmonise human health and animal health systems to improve communicable disease control particularly for HPAI, SARS and other potential zoonoses, and for unknown future threats. Ultimately, there must be a move to tackle the upstream determinants of disease emergence including social, economic, demographic, environmental and ecological factors. In this way, primary prevention not just preparedness is addressed. Primary prevention includes eliminating organisms, protecting environments, interrupting disease transmission chains, reducing host susceptibility, and improving health education and community participation. All these aspects demand a broader range of collaboration than just limited to the human and animal health sectors and require allocation of resources *across* sectors to improve investment for the most effective prevention measures. Early action in this area is important to overcome sectoral preoccupations, harness national resources, develop capacity and avoid the costs of inaction.

The animal and human health sectors will need to collaborate to address a number of key changes affecting Vietnam in the near future:

Demographic Changes*:* Changes in the size and distribution of Vietnam's population will impact on animal and human health sectors:

Vietnam's human population is expected to increase by about 1 million people per annum. The increase in population will result in an increased demand for livestock with further expected livestock population increases in the next 5 years. Plans for increased export of livestock products will also increase the size of the livestock sector. Growing *urbanisation* of Vietnam and rising incomes will contribute to the increased demand for livestock produce and will separate many consumers from the source of production.

By 2015, approximately 70% of the total human population in Vietnam will still live in rural areas and many rural residents will require the income derived from livestock for financial security/income diversity. As a result, there will still be significant numbers of livestock reared in small numbers in households, although the proportion is expected to fall as industrialisation of poultry production increases. Disease preventive measures appropriate for small (low investment) flocks need to be implemented. Rural residents will remain in close contact with a range of livestock species often reared together in rural households, creating a potential risk for emergence of infectious diseases.

Food safety and security: Changes to animal production systems have ramifications for both human and animal health:

A shift to chilled and frozen poultry could result in an increase in other food borne diseases associated with poultry. Diseases that could emerge include campylobacteriosis and salmonellosis. Changes in practices needs to be monitored and other appropriate measures implemented to prevent these diseases.

***Climate Change**:* Climate change has been cited as the biggest global health threat of the 21st century[13] with the greatest threat to health from indirect consequences such as increased transmission of communicable diseases and reduced local food production:

The principal upstream determinants of health are likely to change as changes in temperature and weather patterns influence the local environment and ecology and the distribution of infectious diseases. These influences could magnify threats to food safety and security and alter disease control priorities for both animal and human health sectors.

Lessons learned relevant to communications and behavioural change

The national avian influenza and emerging diseases plan must be clearly and carefully communicated to all stakeholders so that all parties are fully committed to its coordinated implementation. As discussed in the section on coordination, this means sound communications within the health sector, as well as reliable information exchanges to the party level, other government agencies, civil society organisations, private businesses and the media.

The mobilization and participation of the whole of government, social and civil society organizations, the mass media and the whole of society at all levels with technical guidance of the agriculture and health sectors was a key factor in the success of public awareness-raising and communication activities particularly during high-risk periods.

Risk communication messages from government to the public during outbreaks can be partly designed and tested in advance to ensure rapid implementation when required. This includes print, electronic and media materials, as well as fostering relationships with key disseminators of information such as the media.

Communication with the public is a key prevention and control strategy for all emerging diseases. Communication strategies need to move beyond provision of information and awareness-raising for the general public to more targeted, proven measures for behaviour change based on an understanding of what works locally.

Knowledge of disease can be improved through IEC campaigns but behavioural change is more difficult to achieve especially if the public sees little reason or incentive to change long-standing behaviours and practices. BCC activities need to be based on sound analysis of local perceptions and rational expectations around drivers and incentives for proposed changes in behaviours. Campaigns must also be of sufficient duration to ensure lasting behavioural changes.

[13] Costello et al (2009). Managing the health effects of climate change, The Lancet Commissions, Lancet, Vol.373: 1693-733

A number of human cases of influenza A(H5N1) in Vietnam and elsewhere still appear to result from handling and consuming of sick and dead poultry. Therefore the public health messages related to these practices need to be refined. Communication programs must acknowledge that poverty is one of the drivers of these practices and be aligned with activities designed to reduce poverty.

Changes to the poultry vaccination strategies will potentially leave a considerable number of susceptible poultry in household flocks. Therefore messages about disease reporting in areas where vaccination programs are changed need to be enhanced.

Specific extension programs need to be designed and implemented to support changes to market practices such as restrictions on entry to markets/slaughterhouses and requirements for certification.

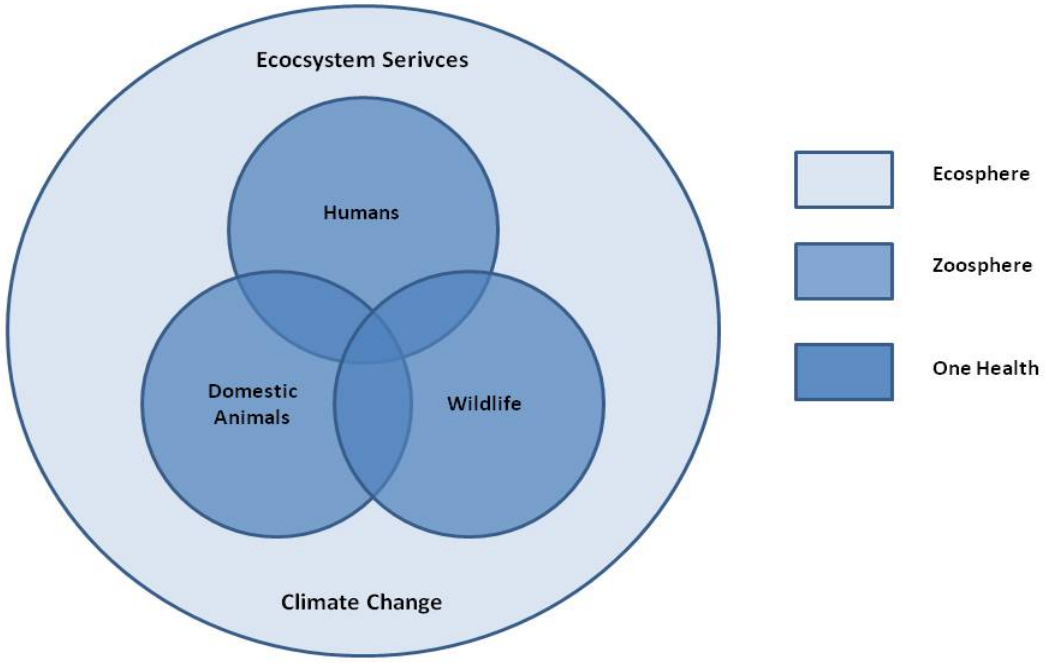
ANNEX II APPLYING A ONE HEALTH APPROACH TO AVIAN INFLUENZA AND OTHER PANDEMIC THREATS

Zoonotic Infectious Disease Risks at the Human-Animal-Ecosystems Interface

Zoonoses are infectious diseases with the ability to pass between different wildlife and livestock species and humans. SARS, Avian Influenza A(H5N1) and the Pandemic (H1N1) 2009 are all examples of zoonotic diseases that have emerged and affected people in different countries throughout the world, including Vietnam, in recent years. Over 60 percent of new diseases in humans during the period 1940 through 2004 were zoonotic diseases originating in livestock or wild animals; more than 75 percent of these came from wild animals (Nature, 2008). It is predicted that on average 1-2 new pathogens per year will emerge in livestock and wild animals globally during the coming period.

The evidence suggests that tropical settings carry a higher disease burden than temperate climates. Vietnam is located in a region associated with an increased risk of new and emerging zoonotic diseases, and there may be a further increase in this risk in coming years due to the effects of climate change.

Figure: Interacting Health Domains
(Source: United Nations & World Bank, 2010)



The application of a One Health approach recognizes that the health of humans, the health of animals (including livestock and wildlife), and the environmental health of ecosystems are inextricably linked. The adoption of a One Health approach is emphasized in the Hanoi Declaration adopted by ministers and senior officials from 70 countries as well as international technical and donor organizations at the International

Ministerial Conference on Animal and Pandemic Influenza (IMCAPI Hanoi 2010), which concludes with the following statement:

> *Finally, call for concerted worldwide efforts by all countries and relevant agencies of the United Nations system, and other international and regional partners, to better understand the emergence of disease threats at the animal-human-environment interface through multi-sectoral actions, and to develop appropriate and sustainable means to reduce such threats.*

Drivers of Disease Risk

The levels and types of interaction between humans and animals and the environmental health of the ecosystems in which these interactions occur can be considered as direct and indirect drivers of infectious disease risk for humans and animals. Changes in any one of these factors may have implications for other factors in these interactions, and can lead to overall changes in the level of risk of serious new public health risks.

Ecosystem Health

The dependence of human health on ecosystem health (whether rural, urban, or natural) has long been recognized by the World Health Organization (WHO) and other public health associations and agencies. Healthy ecosystems are fundamental to human health and well being as they: a) supply resources such as potable water, food, and fuel; b) support essential functions such as nutrient cycling and soil formation; c) provide cultural services for recreational, spirituality and educational purposes; and d) regulate disease processes by keeping pathogens, vectors and pests in check. Numerous case studies demonstrate that deterioration in the health of ecosystems may have negative consequences for the health and well being of human and animal populations.

Figure: Potential Drivers of Zoonotic Diseases
(Source: USAID EPT PREDICT)

Applying a One Health approach in the period 2011-2015

A One Health approach recognizes that HPAI in poultry is one of a range of potentially serious zoonotic disease threats to humans. The plan for the period 2011-2015 aims to continue responding to the threat of HPAI, while at the same time identifying other potential zoonotic disease threats in livestock and wild animals and building on the inter-sectoral cooperation between all related sectors to address these threats over the long term.

Work is currently ongoing globally, regionally and nationally to further develop concepts, principles, activities, monitoring frameworks and other aspects of applying a One Health approach to potentially serious zoonotic diseases. It is expected that this

work will achieve significant progress in the coming period, including provision of technical assistance and rolling out country-level assessments to contribute to practical application of this approach.

Key elements for consideration in the adoption of a One Health approach in the plan during the period 2011-2015:

i. Participating in regional and global conferences and key meetings to develop the concepts, principles and practical application of a One Health approach to serious public health threats emanating from the human-animal-ecosystems interface.

ii. Continuing to strengthen and institutionalize overall coordination mechanisms and alignment of activities at all levels between the animal health sector, the human health sector and related sectors for a comprehensive prevention, preparedness and response to serious infectious disease risks at the human-animal-ecosystems interface. This includes consideration of the need to include new partners in One Health-related coordination mechanisms at all levels.

iii. Clarifying roles and responsibilities and enhancing coordination between agencies responsible for wildlife management and wildlife health as part of a comprehensive approach to animal health, through including all relevant agencies in overall coordination mechanisms and ensuring sufficient institutional linkages between animal health and wildlife protection and management agencies.

iv. Continuing to enhance surveillance and response systems and preparedness for zoonotic disease threats in animals and humans.

v. Carrying out investigations of the circulation of viruses in livestock and particularly wild animals to establish baseline data on disease prevalence in animals in Vietnam and to identify other zoonotic virus families and specific virus strains with the potential to cause serious human disease events.

vi. Continuing to develop the legal and administrative structures for information-sharing, alignment of activities and, where appropriate, joint activities between animal health and human health authorities and experts at all levels including issuing joint circulars, participation in joint trainings, planning exercises, simulations, sharing surveillance and diagnostic data and analysis, carrying out joint outbreak investigations and tracing, and organizing joint meetings to share research and experiences.

vii. Consolidating and continuing to develop applied epidemiology training such as the Field Epidemiology Training Programme (FEPT) for human health and the Applied Veterinary Epidemiology Training (AVET) programme for animal health, including complementary modules on zoonoses and opportunities for exchange between the programs. Following up graduates (fellows) of these programs and providing ongoing support to apply this training and carry out further applied research, including presentation of this research in international seminars and publications.

viii. Identifying opportunities to include One Health concepts and approaches in relevant curricula for different levels and disciplines within the education sector,

in order to develop over time a cohort of capable graduates across a broad range different sectors and disciplines.

ix. Including consideration of environmental health in planning and analysis activities for animal health and human health, and in investigations, tracing and broader analysis of the epidemiology of high-risk zoonotic diseases in animals and humans. Identifying related agencies responsible for environmental health in order to carry out advocacy and for inclusion in coordination mechanisms and activity implementation.

x. Including consideration of human health, animal health and environmental health aspects in setting targets and developing land use, forest management and livestock production plans and models at all levels. Identifying related agencies responsible for environmental health in order to carry out advocacy and for inclusion in coordination mechanisms and activity implementation.

xi. Assessing the potential costs of intensification of livestock and wildlife farming and related aspects that affect the health of agro-ecosystems and other ecosystems in the country, taking into account the implications for future livelihoods (from farming to tourism and many other critical economic activities), the costs of maintaining public health, implications for overall economic development, the effects on quality of life, interactions with climate change, and other critical factors. Assessing the feasibility of indicators for monitoring environmental health in relation to zoonotic disease risks.

xii. Including consideration of human health, animal health and environmental health aspects in analysis of climate change impacts and planning and review of climate change adaptation programmes.

xiii. Designing and implementing awareness raising communications for government authorities, human health and animal health officials and the general public on the risk of zoonotic diseases.

xiv. Designing and implementing targeted behaviour change communications on specific behaviours to reduce risk and enhance prevention, preparedness and control of zoonotic disease risks.

xv. Actively identifying opportunities for engaging enterprises and the private sector as well as public and social organizations in coordination mechanisms, planning and activities for disease prevention, preparedness and response for potentially serious animal and human diseases.

Pathways and Milestones for Key Activities – AGRICULTURE SECTOR

No.	ACTIVITY	YEAR				
		2011	2012	2013	2014	2015
2.1	Veterinary services					
	Veterinary statutory body (VSB)	Study of appropriate models in Asia Determine appropriate structure, composition of body, means of administration and functions	Enabling legislation for establishment of VSB passed (as part of new animal health laws) Minimum qualification standards and CE requirements for veterinarians and veterinary paraprofessionals established (including procedures for existing 'unqualified' long standing practicing paraprofessionals)	Operational procedures and additional legal framework for VSB drafted (including procedures for disciplinary action) Scope of independent practice for veterinary paraprofessionals defined Procedures for registration and requirements for supervision of vet paraprofessionals established	All necessary legal framework for operation in place Documents on ethical and legal obligations for veterinary surgeons and paraprofessionals produced	VSB operational with first registration of veterinarians and veterinary paraprofessionals
2.2	Disease control and prevention					
	Development and implementation of	Provide training in development of	10% of provinces have developed and	35% of provinces have developed and	70% of provinces have developed and	100% of provinces have developed and

No.	ACTIVITY	YEAR				
		2011	2012	2013	2014	2015
	Provincial AI control and prevention plans	provincial plans and central guidelines	are implementing HPAI plans	are implementing appropriate HPAI plans 10% of plans updated	are implementing appropriate HPAI plans 35% of plans updated	are implementing appropriate HPAI plans 70% of plans updated
	Implementation of village or commune- based avian health systems	Review of existing 'successful' village or commune systems and determine which 'models' have scope for broader application Establish mechanisms for support for promotion of similar plans	Preparation of supporting material for villages/ communes that want to implement avian health systems	5 village/ commune based avian health systems implemented	10 village/ commune based avian health systems implemented	50 village/ commune based avian health systems implemented
	Compartments	Discussions with private sector on establishment of compartments Follow up on farms that are already producing poultry for HCM City market without vaccination	Documentation required to establish compartments finalized including details of necessary surveillance on farms and in buffer zones and disease reporting requirements	Development of first compartments	On-going testing of compartments	Further demonstration that compartments have remained free from infection

No.	ACTIVITY	YEAR				
		2011	2012	2013	2014	2015
2.3	Surveillance and epidemiological investigations					
	Provincial surveillance plans and reports	Training on development and reporting of surveillance plans Including all stakeholders in discussions including farmers likely to be affected Baseline (to be determined in year one) but probably <10%	20% of provinces submit appropriate surveillance plans and reports Feed back to provinces on areas for improvement	40% of provinces submit appropriate surveillance plans and reports	70% of provinces submit appropriate surveillance plans and reports	90% of provinces submit appropriate surveillance plans and reports
	Disease reports	Ongoing training on disease investigation and tracing and SOPs Baseline to be determined in year 1 but probably <10%	20% of confirmed outbreaks have appropriate investigation reports Follow up training based on deficiencies of reports received and identified constraints to disease reporting	40% of confirmed outbreaks have appropriate investigation reports Training based on deficiencies of reports received and identified constraints	70% of confirmed outbreaks have appropriate investigation reports Training based on deficiencies of reports received and identified constraints	90% of confirmed outbreaks have appropriate investigation reports Training based on deficiencies of reports received and identified constraints

No.	ACTIVITY	YEAR				
		2011	2012	2013	2014	2015
	Poultry chain and wild life studies carried out through collaboration of animal health and wildlife management agencies.	Plans for research projects developed and funding obtained for relevant studies on wild animals (especially places where there is close contact with humans) and production and market chains Preliminary assessment of current raising practices for 'commercial' wild life farming including origin, places of production, slaughtering practices and methods of trading	First interim report on market chain and wildlife trade studies	Second interim report	Study results prepared for publication and information used for modification of disease prevention and control programs	Plans for additional studies developed to follow up on key findings from initial studies
2.4	Modifications to the livestock sector					
	Traceability (including evaluation of traceability systems)	Review of existing mechanisms for tracing back to farms from large	Design of simple tracing system for small consignments of poultry delivered	Traceability in place for all large farms supplying slaughterhouses	70% of defined population of slaughterhouses and markets have	Passage of new legislation on traceability

No.	ACTIVITY	YEAR				
		2011	2012	2013	2014	2015
		slaughterhouses already in existence Discussions with large slaughterhouses and wholesale markets traders, farmers and transporters on existing and possible means of traceability Initial review and early development of simple tattoo system for pigs (LIFSAP) destined for slaughter	by motor bike		functioning traceability systems that allow trace back to farm of origin for all livestock	
	Farm biosecurity standards	Review existing links between biosecurity measures and access to markets and benefits of applying biosecurity standards [Biosecurity	Agreement reached on appropriate biosecurity standards for intensive farms with >10000 head and >2000 head by DLP and poultry industry	30% of all intensive farms with > 2000 head meet standard External auditing introduced	Passage of appropriate legislation 70% of all intensive farms >2000 head meet standards	90% of all intensive farms with >2000 head meet standards

No.	ACTIVITY	YEAR				
		2011	2012	2013	2014	2015
		Working Group operating in DLP and terms of reference refined Discuss standards with stakeholders				
	Provincial livestock production plans	Review status of existing livestock production plans	10% of provinces have plans that have been examined by DLP for feasibility	20% of provinces have plans that have been examined by DLP for feasibility	40% of provinces have plans that have been examined by DLP for feasibility	70% of provinces have plans that have been examined for feasibility by DLP

Pathways and Milestones for Key Activities – HEALTH SECTOR

ACTIVITY		YEAR				
		2011	2012	2013	2014	2015
3.1	Improving Capacity of the Surveillance and Response System from Central to Local Levels: Strengthening surveillance					
	Implementation of the new law on communicable disease control for all responsible staff at provincial, district and commune levels	Develop training package for 20 new documents Train 30% communes	Train 60% communes	Train 100% communes		
	Training on development/ reporting of PROVINCIAL surveillance plans considering a range of: Surveillance mechanisms for early detection of disease threats (community level event based and rumour surveillance; reporting hotlines; health practitioner reporting of notifiable diseases; facility detection of clusters of selected cases; laboratory based monitoring of micro-organisms)	Define provinces by risk for emergence of high impact emerging diseases Commence with high risk provinces for emerging disease threats – cover 10% of total number of provinces Feedback on	30% of provinces Feedback on quality of plans and performance	50% of provinces Feedback on quality of plans and performance	70% of provinces Feedback on quality of plans and performance	90% of provinces Feedback on quality of plans and performance

	Stakeholders (preventive and curative health staff, laboratory personnel, animal health staff, and community representatives +/- private practitioners) Plans should define how data are to be shared with neighbouring provinces and between preventive and curative departments	quality of plans and performance				
	Implementation, monitoring and evaluation of a common electronic reporting system for all 26 nationally notifiable communicable diseases for 11,000 communes	Review of current systems being trialled Select & upgrade software Develop training package on communicable disease software Cover 5% of communes with computers, network, staff training	For 15% of communes: Provide computers, install network for surveillance, train staff, maintain internet Feedback on performance	For 30% of communes: Provide computers, install network for surveillance, train staff, maintain internet Feedback on performance Evaluation including use of collected information by local staff	For 45% of communes: Provide computers, install network for surveillance, train staff, maintain internet Feedback on performance	For 60% of communes: Provide computers, install network for surveillance, train staff, maintain internet Feedback on performance Evaluation including use of collected information by local staff
	Establishing video conferencing in 7 ecological zones	Review options and select appropriate	2 zones	Review use	4 zones	7 zones

		system Develop training tools				
	Establishing surveillance among private health practitioners (including medical doctors, pharmacists, traditional healers)	Education on communicable disease control law Discussion with private practitioners on options for inclusion in national communicable disease surveillance systems	Review administrative, legal and governing mechanisms for registration of private practitioners Develop pilot surveillance plan and identify suitable sites	Develop training materials for participants and pilot in 5 sites Develop documents on ethical and legal obligations for reporting Agree on function/ responsibilities of governing body, pursue legislation	Evaluate and determine how and where to expand system – contingent on legislation, regulation and governance systems being in place	Legislation in place Governing body established Registration requirements established
	Cross border exchange of surveillance data and strengthening x13 international health quarantine centres	Review existing regional and bilateral mechanisms Ensure a consistent approach across all initiatives	6 border centres: Training on border health quarantine procedures; provision of equipment Achievement of IHR obligations by 2012	7 border centres: Training on border health quarantine procedures; provision of equipment	Meeting with neighbours to review strengths and weaknesses of cross border data exchange, border control measures, laboratory links, hospital referrals	Refresher training for 13 border centres
	Monitoring anti microbial drug resistance with data to feed into	Establish monitoring	Compilation of annual data and	Compilation of annual data and	Compilation of annual data and	Compilation of annual data and

	review and updating of treatment protocols – use	system, testing procedures, links to day-to-day clinical management & treatment protocols	review of treatment guidelines by peak body	review of treatment guidelines by peak body	review of treatment guidelines by peak body	review of treatment guidelines by peak body
3.1	Improving Capacity of the Surveillance and Response System from Central to Local Levels: Strengthening response					
	For 1,600 rapid response teams (RRT) throughout Vietnam: Training on standard procedures for analysing data, conducting outbreak investigations, instituting control measures, reporting on investigations Equipment (PPE, specimen collection kits, vehicles)	Standardise training course & reporting Ensure resupply procedures in place 10% RRTs trained & equipped Legislation and SOPs to protect response staff	30% RRTs trained & equipped	50% RRTs trained & equipped Review training and performance of RRTs	Update training course 75% RRTs trained & equipped	100% RRTs trained & equipped
	Increasing field epidemiology skills for preventive health departments through: Short term (2 week) courses for current preventive health staff – need to ensure these courses are complementary to training on	MoH to quantify need for basic and specialist epidemiology skills at central, provincial, district and commune levels; select staff	x10 short training courses in high risk provinces and districts FETP intake of x10	x10 short training courses in high risk provinces and districts (FETP students to assist with training) FETP + AVET	x10 short training courses in provinces and districts FETP intake of x10	x10 short training courses provinces and districts (FETP students to assist with training) FETP + AVET

	surveillance and training for RRTs Long term (2 year) applied courses (FETP) for career epidemiologists from a range of disciplines (medical, nursing, veterinary, environmental health etc.)	for training x10 short training courses in high risk provinces and districts Finalise organisational arrangements for FETP – university accreditation, scholarships, career pathway within preventive medicine, links with AVET program Development of common core curricula for FETP/ AVET courses	FETP + AVET meeting with presentations from students	conference – combine with Mekong country FETP conference	FETP + AVET meeting with presentations from students	conference – combine with Mekong country FETP conference
3.2	Improving the Treatment Capacity of Provincial and District Hospitals: Strengthening diagnostic capacity					
	Improving pandemic preparedness for national laboratory network	Review performance of public health labs during 2009 H1N1	Training for laboratory staff on laboratory testing, quality assurance	Develop a framework for introduction and use of rapid point of care tests for	Review and update lab based aspects of national action plan	Refresher training for laboratory staff on laboratory testing, quality assurance and

		pandemic Develop national network of accredited public health laboratories with external/ internal quality assurance measures, inclusion in national surveillance system for communicable diseases, and defined collaborations with animal health labs. Review the need for additional provincial diagnostic capacity (e.g. PCR) bearing in mind improvements in transport specimen and processing time and need for quality assurance	and biosafety Update laboratory related aspects of national action plan for pandemics including surge capacity, procurement and logistic arrangements (for reagents, primers) rationing of non-essential tests, maintenance of essential services	influenza and other diseases during routine practice and outbreaks Regional information sharing workshop to review laboratory based aspects of pandemic planning, surveillance, diagnostics and research on emerging infectious diseases		biosafety

3.2	Improving the Treatment Capacity of Provincial and District Hospitals: Strengthening curative care					
	Develop training Package for provincial and district health staff based on existing national guidelines for: Diagnosis and treatment of H1N1 Infection control in healthcare facilities Use of newly procured medical equipment (e.g. ventilators)	Develop training courses 10% staff trained	30% staff trained	50% staff trained	75% staff trained	100% staff trained
	Upgrade provincial and district hospitals with isolation facilities and provide medical equipment for treatment of severe influenza (55 units in total)	10 units upgraded and equipped and matched with staff training	20 units upgraded and equipped	30 units upgraded and equipped	40 units upgraded and equipped	55 units upgraded and equipped
	Implementation of national infection control plan for health facilities					
	Training on development of health facility pandemic plans for provincial and district hospitals including maintenance of essential services (e.g. power, water, waste, and transport), managing absenteeism, establishing field hospitals etc. Plans should be aligned with	Develop training courses 10% hospitals trained and pandemic plans reviewed	30% hospitals trained and pandemic plans reviewed Design and conduct simulation to test selected	50% hospitals trained and pandemic plans reviewed	75% hospitals trained and pandemic plans reviewed Design and conduct simulation to test selected	100% hospitals trained and pandemic plans reviewed

	disaster management plans.		provincial/ district hospital's pandemic plan		provincial/ district hospital's pandemic plan	
	Establishment of specialist curative sector rapid response teams for emerging infectious diseases	Development of roles and responsibilities, training tools, guidelines for deployment in key tertiary referral centre for specialist infectious disease clinicians		Evaluate performance of curative sector rapid response teams	Hanoi tropical medicine hospital to host training for RRT	
3.3	Strengthening the Capacity of the Local Preventive Medicine System					
	Strengthen national action plan for influenza and other pandemics	Review national response to H1N1 pandemic and update national plan (including impact of non-pharmaceutical measures, announcements of phase changes, speedier processing of international resources) Review	Review public health legal framework for communicable disease emergencies (property management and control, fast tracking vaccines, balancing individual and community interests) Reform		Strengthen national action plan for influenza and other pandemics	

		international studies on models and scenarios to improve pandemic planning (e.g. recent costed plans for Mongolia and China)	administration procedures for imported emergency supplies (vaccines, antivirals, equipment)			
	Expansion of VAHIP model to strengthen district preventive medicine units in remaining 240 districts	30 additional districts covered	60 additional districts covered		Expansion of VAHIP model to strengthen district preventive medicine units in remaining 240 districts	30 additional districts covered
	Simulation exercises at provincial and district levels		Develop realistic simulations involving curative and preventive health sectors, animal health, other government departments, and other actors involved in responding to natural disasters (e.g. civil society such as Vietnam Red Cross) Trial simulations in selected high		Simulation exercises at provincial and district levels	

			risk sites – 10% of provinces			
3.4	Strengthening Behaviour Change Communication					
	Behaviour change communications	Review programs undertaken during 2006-2010 to determine the most effective BCC programs	Adopt a risk-based approach for targeting BCC Conduct awareness raising and BCC campaigns	Conduct awareness raising and BCC campaigns	Conduct awareness raising and BCC campaigns	Review BCC programs
	Risk communications	Development of risk communications training for key health staff at provincial and district level 10% health staff trained	Development of website and generic IEC materials for public and health staff for rapid adaptation during an outbreak 20% health staff trained	Development of risk communications for private sector 30% health staff trained	40% health staff trained	50% health staff trained Review IEC materials and website
3.5	Strengthening Coordination					
	Improving pandemic preparedness through improved coordination	Review coordination elements of response to H1N1 including mandate, functioning and performance of steering	Review function and capacity of emergency management system for natural disasters compared with pandemics and other	Establish coordination mechanisms between neighbouring provinces As provincial preparedness		Evaluate strength and quality of key relationships within health sector, across sectors, bilaterally, regionally and internationally

		committees, organisational structure, sharing of information within the health sector, determination of phases and communication of change in phase, cross-sectoral coordination to ensure maintenance of essential services and business continuity Establish thematic working groups as required to provide impetus and oversight for monitoring and evaluation and capacity building. Consider adding a working group for eco-health system aspects.	communicable disease threats to improve collaboration and efficient use of resources– may involve study tours to review other organisational models	improves, links between provinces increase and videoconferencing is established in ecological zones, review pros/ cons of organisation of pandemic response by ecological zone		
	Improve collaboration and coordination of animal and	Based on new legal framework,	Joint training on SOPs (could be	Joint training on SOPs (could be	Joint training on SOPs (could be	

	human health sectors	develop SOPs for collaboration at central, provincial, district and commune level including strategic and planning functions, operations and response and research	linked with other training)	linked with other training)	linked with other training)	
	Coordination of an eco-system health approach or addressing drivers of disease/ instituting a preventive health approach/ one health approach etc					
3.6	Other Activities: Improving research					
	Research on virological and epidemiological aspects prioritised by NIHE (epidemiological studies of human and avian influenza; risk factors HPAI; interaction of influenza viruses in humans and animals; evolution of influenza viruses in humans and animals; community spread of influenza viruses; rapid diagnostic tests for influenza virus, particularly point of care tests; vaccine development)	Develop research agenda and secure funding Consider regional coordination of research	Annual presentations of research findings and review of research agendas	Annual presentations of research findings and review of research agendas	Annual presentations of research findings and review of research agendas	Annual presentations of research findings and review of research agendas
	Research on social aspects such	Develop research	Annual	Annual	Annual	Annual

	as understanding health seeking behaviours; communications; policy; health management; and health system aspects relevant to responding to pandemics and emerging diseases	agenda and secure funding	presentations of research findings and review of research agenda	presentations of research findings and review of research agenda	presentations of research findings and review of research agenda	presentations of research findings and review of research agenda
	Development of an online lessons learned database covering all aspects relevant to avian influenza, pandemic influenza and emerging diseases – base on existing online catalogue developed by communications subcommittee	Define stakeholders, assign responsibilities and develop an action plan for gathering local and international resources		Evaluate online database		

ANNEX IV COST TABLES

Detailed cost estimate for the period 2011-2015 (Million VND)

No.	ACTIVITY	UNIT	COST	QUANTITY	TOTAL BUDGET	Proposed Source	
						GoV	ODA
	COMPONENT I – Enhanced Coordination Activities						
1.1	**Overall Central Coordination of the Program**						
1.1.1	Steering Committee for Avian Influenza Prevention and Control	Year	210	5	1,050.00	1,050.00	
1.1.2	Steering Committee for Human Pandemics Prevention and Control	Year	210	5	1,050.00	1,050.00	
1.1.3	Joint annual review and strategic planning for the animal health sector, human health sector and related sectors	Meeting	210	5	1,050.00		1,050.00
1.2	**Overall Provincial Coordination of the Program**						
1.2.1	Steering Committee for Avian Influenza Prevention and Control	Year	105	5	525.00	525.00	
1.2.2	Steering Committee for Human Pandemics Prevention and Control	Year	105	5	525.00	525.00	
1.2.3	Joint annual review and strategic planning for the animal health sector, human health sector and related sectors	Meeting	105	5	525.00	315.00	210.00
1.3	**Support to Donor Coordination**						
1.3.1	Annual Plenary meeting of the Partnership	Meeting	210	5	1,050.00		1,050.00
1.3.2	Support to quarterly BCC Working Group meetings	Meeting	52.5	20	1,050.00		1,050.00
1.3.3	Other policy and technical meetings of the Partnership	Meeting	105	20	2,100.00		2,100.00
1.3.4	PAHI Secretariat office rental monthly estimate x 5 years)	Rent	16.8	60	1,008.00	1,008.00	
1.3.5	PAHI Secretariat personnel and operations	Annual estimate	2,520.00	5	12,600.00		12,600.00
1.4	**Overall Program Monitoring and Evaluation**						
1.4.1	Capacity development on overall monitoring	Year	1,680.00	5	8,400.00		8,400.00

No.	ACTIVITY	UNIT	COST	QUANTITY	TOTAL BUDGET	Proposed Source	
						GoV	ODA
1.4.2	Annual consolidated monitoring report	Year	420	5	2,100.00	1,050.00	1,050.00
1.4.3	Mid-term review	Package	4,200.00	1	4,200.00		4,200.00
1.4.4	Final review	Package	4,200.00	1	4,200.00		4,200.00
1.5	**Support for Regional Coordination**						
1.5.1	Participation in key overall regional and international meetings (3 meetings per year x delegation of 4 officials x 5 years)	Trip	210	15	3,150.00		3,150.00
	Component I TOTAL				**44,583.00**	**5,523.00**	**39,060.00**
	COMPONENT II - HPAI control and eradication and strategy for emerging infectious diseases in the Agricultural Sector						
	Strengthening Veterinary and Animal Production Services						
2.1	**Veterinary services**						
2.1.1	***Central veterinary administration***						
	Base salaries and allowances, local travel and office accommodation for senior staff	Year	840	5	4,200.00	4,200.00	
	Preparation of a consolidated plan for strengthening of veterinary services	Plan	2,100.00	1	2,100.00	420.00	1,680.00
	Development of a veterinary statutory body	Package	3,150.00	1	3,150.00	630.00	2,520.00
	Attendance of senior staff at appropriate international and regional meetings	Package	1,260.00	5	6,300.00	1,260.00	5,040.00
	Development and passage of appropriate comprehensive animal health legislation	Laws	4,200.00	1	4,200.00	840.00	3,360.00
	Further assessment of veterinary services (PVS process)	Assessment	630	1	630.00		630.00
2.1.2	***Veterinary laboratory services***						
	Base line resources for operation of veterinary laboratories (utilities, permanent staff, building	Laboratory	8,925.00	8	71,400.00	14,280.00	57,120.00

No.	ACTIVITY	UNIT	COST	QUANTITY	TOTAL BUDGET	Proposed Source	
						GoV	ODA
	maintenance, supply of essential reagents)						
	Organisation of one laboratory network meeting per annum	Meeting	525	5	2,625.00	787.50	1,837.50
	Construction of two new veterinary laboratories	Laboratory	315,000.00	2	630,000.00	441,000.00	189,000.00
	Finalising formal accreditation of all national and regional laboratories, including on-going international technical support for accreditation and compliance testing	Laboratory	3,150.00	8	25,200.00	7,560.00	17,640.00
	Renovation of existing regional centre laboratories to ensure their biosafety	Laboratory	3,150.00	8	25,200.00	8,400.00	16,800.00
	Employment of contract staff to conduct additional testing for avian influenza and other emerging infectious diseases	Person-Month	6.3	1,920	12,096.00	3,628.80	8,467.20
	Full program of calibration and maintenance and replacement/upgrading for existing equipment	Package	10,500.00	5	52,500.00		52,500.00
	Reagents for additional surveillance and diagnostic testing for avian influenza and emerging infectious diseases	Package	2,520.00	40	100,800.00	20,160.00	80,640.00
	Post-graduate training for veterinary pathologists and case managers	Persons	2,520.00	8	20,160.00		20,160.00
	Additional training on new laboratory techniques and detection methods for new pathogens	Package	21,000.00	1	21,000.00		21,000.00
	Review of plans of proposed veterinary laboratories by international experts in laboratory planning and construction	Package	4,200.00	1	4,200.00		4,200.00
	Additional laboratory network meetings	Package	840	5	4,200.00		4,200.00
	Recognition of RAHO-6 as ASEAN regional reference laboratory for Classical swine fever	Package	2,100.00	1	2,100.00		2,100.00
2.1.3	***Veterinary field services***						
	Baseline funding for staff provided by national and provincial authorities and for standard and limited	Person-Month	1.1	75,600	79,380.00	23,814.00	55,566.00

No.	ACTIVITY	UNIT	COST	QUANTITY	TOTAL BUDGET	Proposed Source	
						GoV	ODA
	emergency field operations						
	Payment of a small allowance for selected commune-based veterinary paraprofessionals to conduct government-related activities	Person-Month	0.6	113,400	71,442.00	7,144.20	64,297.80
	Delineating the responsibilities of public and private sector veterinarians and paraprofessionals and building of public-private partnerships for delivery of veterinary services	Package	2,100.00	1	2,100.00		2,100.00
	Conducting a review of the status of epidemiology units at provincial (SDAH) and regional (RAHO) levels to establish the best way to provide appropriate epidemiological services	Package	1,050.00	1	1,050.00		1,050.00
	A system for replacement of vehicles as they reach the end of their working life	Vehicle	1,050.00	60	63,000.00		63,000.00
	Formal training in basic and advanced epidemiology, surveillance and disease investigations through the form of AVET or similar training programme where the focus will also be placed on improved data analysis and interpretation	Course	630	20	12,600.00		12,600.00
	Strengthening of undergraduate veterinary training especially in the areas of disease investigations and epidemiology, including establishment of twinning relationships with overseas universities	Person	3,150.00	7	22,050.00		22,050.00
2.1.4	***Quarantine/border services***						
	Baseline salaries and maintenance of existing facilities	Station	630	60	37,800.00	18,900.00	18,900.00
	Improved and new border control stations	Station	1,050.00	5	5,250.00	1,575.00	3,675.00
	Training for border control staff	Person	105	34	3,570.00	1,785.00	1,785.00
	Regional and bilateral meetings to enhance cross border liaison for trans-boundary diseases	Meeting	630	15	9,450.00	4,725.00	4,725.00

No.	ACTIVITY	UNIT	COST	QUANTITY	TOTAL BUDGET	Proposed Source	
						GoV	ODA
	Additional studies in border areas to understand drivers of cross-border trade (including illegal trade)	Package	2,100.00	1	2,100.00		2,100.00
2.1.5	***Veterinary public health services***						
	Basic salaries and allowances for staff to undertake current core activities, including work in markets and slaughterhouses	Person-Month	4.2	75,600	317,520.00	285,768.00	31,752.00
	Additional training in meat inspection and slaughterhouse hygiene	Person	21	1,260	26,460.00	13,230.00	13,230.00
	Enhancement of laboratory capacity in food testing laboratories	Laboratory	10,500.00	10	105,000.00	84,000.00	21,000.00
	Enhanced capacity to regulate the use of antimicrobial compounds in animals	Package	9,450.00	10	94,500.00	75,600.00	18,900.00
	Additional training on safety and outbreak notification for commune and village extension staff	Package	3,150.00	1	3,150.00		3,150.00
2.1.6	***Strengthening of animal production services***						
	Salaries and basic allowances for national staff in DLP, central extension staff and livestock extension staff employed by provincial departments	Year	2,100.00	1	2,100.00	2,100.00	
	Review of scope of animal production services required by the livestock sector (public and private) and the current status of these services (using a process aligned with the OIE gap analysis for veterinary services) including shortfalls in manpower and ways to provide support to the developing livestock sector	Package	2,100.00	1	2,100.00		2,100.00
	Support for training in spatial planning and developing and assessing livestock development plans	Package	6,300.00	1	6,300.00		6,300.00
	Training in farm biosecurity for animal production staff (including biosecurity standards and conduct of audits)	Package	4,200.00	1	4,200.00		4,200.00
	Train on implementation, surveillance, evaluation of traceability system	Package	4,200.00	1	4,200.00		4,200.00

No.	ACTIVITY	UNIT	COST	QUANTITY	TOTAL BUDGET	Proposed Source	
						GoV	ODA
	Revision of and training in application of GAHPs for livestock farms of different sizes	Package	8,400.00	1	8,400.00		8,400.00
	Support to strengthen the public-private relationship in livestock						
	1. Assess the role of the private sector in seed production, animal food, veterinary services and agricultural extension	Package	2,100.00	1	2,100.00		2,100.00
	2. Support institutional development to promote public-private in livestock production	Package	2,100.00	1	2,100.00		2,100.00
	3. Annual training, conference, workshop in regional, national and international level	Package	4,200.00	1	4,200.00		4,200.00
2.2	**Disease Control and Prevention**						
2.2.1	Basic salaries and allowances and equipment for staff involved in rapid response to disease outbreaks and existing control and preventive programs including vaccination programs	Person-Month	3.2	18,900	59,535.00	17,860.50	41,674.50
2.2.2	Vaccines for targeted vaccine programs for selected major animal diseases	Package	315,000.00	5	1,575,000.00	1,260,000.00	315,000.00
2.2.3	Updates of national disease control and prevention plans for all major diseases	Package	1,575.00	3	4,725.00	945.00	3,780.00
2.2.4	Replacement/replenishment of emergency supplies of PPE and materials for cleaning and disinfection	Package	6,300.00	5	31,500.00	6,300.00	25,200.00
2.2.5	Additional training in appropriate methods of cleaning and disinfection	Course	735	20	14,700.00	4,410.00	10,290.00
2.2.6	International support for review of vaccination/disease control and prevention strategies	Mission	1,785.00	5	8,925.00		8,925.00
2.2.7	Applied research into vaccination against important infectious diseases (including improved vaccines and vaccination strategies)	Package	5,250.00	5	26,250.00	5,250.00	21,000.00
2.2.8	Mock outbreak responses at commune level	Simulation	525	20	10,500.00		10,500.00
2.2.9	Replacement of supplies for vaccinators (provided by	Package	52.5	700	36,750.00	11,025.00	25,725.00

No.	ACTIVITY	UNIT	COST	QUANTITY	TOTAL BUDGET	Proposed Source	
						GoV	ODA
	donors from 2005)						
2.2.10	Implementation of compartments for the poultry sector	Compartment	525	100	52,500.00		52,500.00
2.2.11	Provincial plans for disease control prevention and elimination, starting initially with HPAI.	Plan	210	45	9,450.00		9,450.00
2.2.12	Applied research into avian influenza and emerging infectious diseases, focusing on key gaps in knowledge that currently hinder control, prevention and rapid identification of these diseases,	Study	6,300.00	5	31,500.00	9,450.00	22,050.00
2.2.13	Maintaining links to international agencies and academic institutions and related programs such as GFTADS, SEAFMD at the operational level.	Meeting	1,575.00	5	7,875.00		7,875.00
2.2.14	Review of existing examples of livestock health programs developed for or by small-scale producers and to develop additional commune- or village- based activities, based on these or other suitable models.	Package	1,050.00	1	1,050.00		1,050.00
2.2.15	Review of existing MARD technical transfer activities towards biosecurity, strengths, weaknesses and constraints.	Package	420	1	420.00		420.00
2.2.16	Training agricultural extension staff as an efficient reserve force for disease control and prevention (pilot in 7 selected provinces).	Package	630	1	630.00		630.00
2.3	**Surveillance and Epidemiological Investigations**						
2.3.1	Appropriate post vaccination monitoring of the response to vaccination in poultry	Round	6,300.00	10	63,000.00	18,900.00	44,100.00
2.3.2	Submission of samples from disease outbreaks in livestock and other animals	Sample	1,050.00	5	5,250.00	5,250.00	
2.3.3	Disease outbreak investigations for avian influenza (including joint investigations with human health staff) and other important infectious diseases	Investigation	105	100	10,500.00		10,500.00
2.3.4	Appropriate active surveillance in selected markets and slaughterhouses for avian influenza viruses to	Market	63	200	12,600.00		12,600.00

No.	ACTIVITY	UNIT	COST	QUANTITY	TOTAL BUDGET	Proposed Source	
						GoV	ODA
	demonstrate changes in levels of infection over time						
2.3.5	Appropriate surveillance in wild animals for infectious agents and studies of wild animal trade to identify key areas of risk	Survey	6,300.00	2	12,600.00		12,600.00
2.3.6	Improvements to databases used for recording and reporting surveillance and disease investigations	Database	16,800.00	1	16,800.00		16,800.00
2.3.7	Additional training for front line veterinary paraprofessionals in identification and reporting of disease outbreaks by clinical syndrome,	Person	21	1,200	25,200.00		25,200.00
2.3.8	Additional studies on incentives for disease reporting including compensation systems so as to improve reporting systems	Study	1,050.00	2	2,100.00		2,100.00
2.3.9	Appropriate surveillance to demonstrate on-going freedom from infection with H5N1 HPAI in compartments and other enterprises	Survey	1,575.00	5	7,875.00		7,875.00
2.3.10	Additional training in disease investigations and epidemiology (see A1)	Person	52.5	300	15,750.00		15,750.00
2.3.11	Development and implementation of appropriate provincial surveillance plans	Plan	147	25	3,675.00		3,675.00
2.3.12	Improved modelling of selected diseases based on better quality field data	Study	1,575.00	5	7,875.00		7,875.00
2.3.13	Studies into production and market chains to establish key risk points for disease transmission and persistence	Study	2,520.00	3	7,560.00		7,560.00
2.4	**Modifications to the Livestock Sector**						
2.4.1	Preparation and review of national and provincial plans for the livestock sector	Package	10,500.00	1	10,500.00		10,500.00
2.4.2	Operation of the Biosecurity Working Group	Package	2,100.00	1	2,100.00		2,100.00
2.4.3	Development of and training in biosecurity standards and biosecurity audits	Package	2,100.00	1	2,100.00		2,100.00

No.	ACTIVITY	UNIT	COST	QUANTITY	TOTAL BUDGET	Proposed Source	
						GoV	ODA
2.4.4	Development of improved biosecurity plans for livestock planning zones	Package	4,200.00	1	4,200.00		4,200.00
2.4.5	Upgrading of slaughterhouses and retail markets (DAH activity)	Package					
2.4.6	Modification and application of GAHPs and GAHP certification (especially modification of GAHPs for small-scale producers)	Package	4,200.00	1	4,200.00		4,200.00
2.4.7	Implementation of appropriate waste treatment systems on livestock farms	Package	23,100.00	1	23,100.00		23,100.00
2.4.8	Introducing practical livestock identification systems that allow tracing of poultry and other livestock from farms to wholesale markets or slaughterhouses	Package	2,100.00	1	2,100.00		2,100.00
2.4.9	Risk management in free grazing duck production in Mekong Delta						
	1. Assess the status of breeding duck in Mekong Delta after 7 years avian influenza occurred	Study	4,200.00	1	4,200.00		4,200.00
	2. Assess the implementation of government regulations on free grazing duck production	Study	2,100.00	1	2,100.00		2,100.00
	3. Additional research on management initiatives and additional regulations on management of duck breeding	Study	1,680.00	1	1,680.00		1,680.00
	4. Management capacity building for the local livestock staff (training, conferences and workshops at national and international level on management experience in breeding duck)	Package	4,200.00	1	4,200.00		4,200.00
	5. Training and modelling of controlled duck breeding	Package	10,500.00	1	10,500.00		10,500.00
	6. Organizing the conference to review the implementation results (regional, national level)	Package	2,100.00	1	2,100.00		2,100.00
2.4.10	Supporting to innovate hatching system						
	1. Assessing the status of hatching all over the country	Study	4,200.00	1	4,200.00		4,200.00
	2. Assessing the implementation of government	Study	2,100.00	1	2,100.00		2,100.00

No.	ACTIVITY	UNIT	COST	QUANTITY	TOTAL BUDGET	Proposed Source	
						GoV	ODA
	regulations on hatching system						
	3. Additional research on management initiatives and additional regulations on management of hatching system	Study	1,050.00	1	1,050.00		1,050.00
	4. Management capacity building for local livestock staff (training, conference, workshops at national level on management experience in hatching)	Package	3,150.00	1	3,150.00		3,150.00
	5. Training and modelling of poultry hatching	Package	8,400.00	1	8,400.00		8,400.00
	6. Organizing conference to review the implementation results	Package	2,100.00	1	2,100.00		2,100.00
2.4.11	Supporting to risk management in raising domesticated wild animals						
	1. Assessing demand and potential of developing domesticated wild animal production	Package	4,200.00	1	4,200.00		4,200.00
	2. Assessing potential risks of arising infectious disease in wild animal	Package	4,200.00	1	4,200.00		4,200.00
	3. Training and instructions to apply the technical measures in domesticated wild animals production	Package	2,100.00	1	2,100.00		2,100.00
	4. Pilot model	Package	6,300.00	1	6,300.00		6,300.00
	5. Organizing conference to review the implementation results and replication	Package	2,100.00	1	2,100.00		2,100.00
2.4.12	Managing the risk of livestock waste to ensure disease security	Package	23,100.00	1	23,100.00		23,100.00
2.5	**Public Awareness and Behavioural Change**						
2.5.1	Annual publicity campaigns during high risk periods and in areas where vaccination campaigns are being modified	Campaign	5,250.00	5	26,250.00	7,875.00	18,375.00
2.5.2	Review of BCC campaigns and programs including school based programs to determine which methods warrant replication	Review	630	5	3,150.00		3,150.00

No.	ACTIVITY	UNIT	COST	QUANTITY	TOTAL BUDGET	Proposed Source	
						GoV	ODA
2.5.3	Development of appropriate communication Package to discourage butchering of dead or sick poultry	Package	2,625.00	5	13,125.00		13,125.00
2.5.4	Improve communication activities through central and local agricultural extension system	Package	420	1	420.00	42.00	378.00
2.5.5	Development of appropriate extension and training Package for slaughterhouse and market workers on disease control and prevention and hygiene measures	Package	5,250.00	7	36,750.00		36,750.00
2.5.6	Capacity building for local veterinarian and commune, district agricultural extension staff: • Capacity building for local veterinarian and commune agricultural extension staff (through training, visiting models…) • Communication training support for commune agricultural extension workers. Developing sample clubs of village extension on biosecurity. Training village collaborators.	Package	4,200.00	1	4,200.00	210.00	3,990.00
2.5.7	Support training on GAHP for livestock production and role of farmers for community health (extension staff trains farmers: Develop pilot training programs, implementation, assessment, survey on the disease situation in humans and animals in 7 selected provinces)	Package	840	1	840.00		840.00
2.5.8	Development of some suitable key demonstration which ensure the disease control in livestock production chain.	Package	840	1	840.00	84.00	756.00
	Component II TOTAL				**4,167,933.00**	**2,369,409.00**	**1,798,524.00**
	COMPONENT III - Pandemic Preparedness and influenza and emerging infectious disease prevention in the Health Sector						
3.1	**Improving Capacity of the Surveillance and Response System from Central to Local Level**						

No.	ACTIVITY	UNIT	COST	QUANTITY	TOTAL BUDGET	Proposed Source	
						GoV	ODA
3.1.1	Training on implementation of law documents	Course	277.2	60	16,632.00	16,632.00	
	- 10 course x 6 year x 13,200/ course, including:						
	+ 2 days x$ 65 x 40 people/course						
	+ Travel: 5,000/course (including air ticket, travel by other public means)						
	+ Other cost: $3,000 (Meeting room, document, teacher, photocopy, stationary,...)						
3.1.2	Develop video conference in ecological zones (7 zones x $40,000)	Package	840	7	5,880.00	5,880.00	
3.1.3	Conduct simulation exercises with preventive and curative fields AND human health and animal health in 50% of provinces (32 exercises x $25,000)	Exercise	525	32	16,800.00	10,500.00	6,300.00
3.1.4	Printing and disseminating materials and documents of surveillance (20 law documents x $10,000)	Package	210	20	4,200.00		4,200.00
3.1.5	Implementation of software for communicable disease surveillance system and new model of surveillance system						
	Upgrading the existing communicable disease surveillance system software ($6,000/year x 5 years)	Package	126	5	630.00		630.00
	Training on communicable disease surveillance software for preventive workers in all levels (275 training courses x $9,990/course (air ticket $200, other cost $125/person x 30 people/course).	Course	204.8	275	56,306.25	35,306.25	21,000.00
	Maintaining internet network for regional, provincial, district levels (750 units x $2,000)	Unit	42	750	31,500.00	31,500.00	
	Providing computers and maintaining the internet network for surveillance at commune level	Commune	25.2	11,000	277,200.00	46,200.00	231,000.00
	11,000 communes x $1,000/set						
	11,000 communes x $200 to maintain internet network						

No.	ACTIVITY	UNIT	COST	QUANTITY	TOTAL BUDGET	Proposed Source	
						GoV	ODA
	Maintaining and updating Website of preventive health system ($20,000/year x 5 years).	Year	420	5	2,100.00	2,100.00	
3.1.6	Upgrading the online meeting room of GDPM and Institutes						
	Screen and standard equipment (front-end) for four Institutes, including the cost of installation, user manual and maintenance	Package	315	4	1,260.00		1,260.00
	52 inch television for 4 Institutes	Unit	34.7	4	138.60		138.60
	Cable internet fee for 4 institute s	Package	10.5	4	42.00	42.00	
	Monthly subscription for internet systems for 4 Institutes $250/month x 12 months x 5 years	Unit	5.3	72	378.00	378.00	
3.1.7	Retraining on surveillance system and pandemic response: report process, case detecting... (1,600 rapid response teams x 5 person/team x 2 turns/5 years x $300/person/year)	Person/ Year	6.3	16,000	100,800.00	63,000.00	37,800.00
3.1.8	Provision of equipment for rapid response teams (RRT):						
	PPEs (1,600 RRT x 5 per/team x 100 set/5 years x $10/set)	Set/Team/ Year	3,360.00	50	168,000.00	84,000.00	84,000.00
	Vehicles for outbreak investigation (620 districts x $35,000)	Vehicle	735	620	455,700.00		455,700.00
	Pickup trucks for spraying chemicals (40 vehicles for provinces or institutes with no vehicles x $20,000)	Vehicle	420	40	16,800.00		16,800.00
	Specimen collection kits, diagnosis kits (1,600 RRTs x 1,000 set/5 years x $15/set)	Set	33,600.00	15	504,000.00		504,000.00
3.1.9	Develop the FETP training program in Vietnam						
	Consulting on developing FETP program: development orientation 2011-2015	Person	630	2	1,260.00	1,260.00	
	Organizing short term FETP course (30 short term training course/years x $10,000/course x 5 year)	Course	210	150	31,500.00		31,500.00

No.	ACTIVITY	UNIT	COST	QUANTITY	TOTAL BUDGET	Proposed Source	
						GoV	ODA
	Organizing long-term FETP course (2 year)	Course	840	50	42,000.00		42,000.00
	10 long-term course/year x $40,000/course x 5 year						
3.1.10	Organizing International and local information sharing workshops:						
	International workshops held in Vietnam (5 workshops x $50,000)	Workshop	1,050.00	5	5,250.00		5,250.00
	Study tours abroad (3 courses/5years x $ 50,000/course)	Course	1,050.00	3	3,150.00		3,150.00
3.1.11	Strengthening border health quarantine system:						
	Provision of essential equipment for International Health Quarantine Centres (13 centres x $100,000)	Centre	2,100.00	13	27,300.00		27,300.00
	Training on border health quarantine (3 courses/5 years x 2 turns/5 year x $25,000)	Course	525	6	3,150.00	3,150.00	
3.1.12	Improvement of quality of laboratories:						
	Procurement of PCR capacity (35 provinces without PCR x $100,000/set)	Set	2,100.00	35	73,500.00		73,500.00
	Training on improvement of labs (12 courses/ 5 years x $25,000)	Course	525	12	6,300.00		6,300.00
	Training on applying QAS for local levels $50,000/year x 5 years	Course	1,050.00	5	5,250.00		5,250.00
3.2	**Improving Treatment capacity of Provincial and District Hospitals**						
3.2.1	Training to improve diagnostic and treatment skills of health workers, especially at district level (800 units x 3 per each x 2 turns/ 5 years x $400)	Course	8.4	4,800	40,320.00	40,320.00	
3.2.2	Training to improve hospital infection control capacity (800 units x 2 per each x 2 turns/ 5 years x $400)	Course	8.4	3,200	26,880.00	26,880.00	
3.2.3	Upgrading isolation rooms for provincial and district hospitals (55 units x $30,000)	Package	630	55	34,650.00	13,650.00	21,000.00

No.	ACTIVITY	UNIT	COST	QUANTITY	TOTAL BUDGET	Proposed Source	
						GoV	ODA
3.2.4	Provision of medical equipment for AI treatment for provincial and district hospitals (55 units x $300,000)	Set	6,300.00	55	346,500.00	207,900.00	138,600.00
3.2.5	Organize the inspection and supervision of monitoring and statistical reporting implementation of infectious diseases in hospitals, medical facilities nationwide to ensure strict implementation of Circular No. 48 / 2010/TT-BYT dated 31/12/2010 of the Minister of Health (team of 5-7 central and local health care managers over 5 years)	Year	420	5	2,100.00	2,100.00	
3.3	**Strengthening Capacity of the Local Preventive Medicine System**						
3.3.1	Strengthening district preventive medicine system using the VAHIP model in all remaining districts (240 districts x $200,000/district)	District	4,200.00	240	1,008,000.00	504,000.00	504,000.00
3.4	**Strengthening Behaviour Change Communication**						
3.4.1	Improving the knowledge and communication skills of health workers in hospitals and preventive health units (63 provinces x $10,000/ 5 years)	Package	210	63	13,230.00	6,615.00	6,615.00
3.4.2	Conducting community AI communication campaigns (63 provinces x $20,000/year x 2 turns/ 5 years)	Campaign	420	126	52,920.00	26,460.00	26,460.00
3.4.3	Training to improve communication capacity and skills for community based communicators - TOT. (63 provinces x $20,000/year x 2 turns/ 5 years)	Course	420	126	52,920.00	26,460.00	26,460.00
3.4.4	IEC printing and distribution (630,000 materials/turn x $30,000/turn x 10 turns)	Package	630	10	6,300.00	3,150.00	3,150.00
3.5	**Strengthening Coordination**						
3.5.1	Support for surveillance and emergency pandemic prevention and response(periodical consulting and monitoring advisor, $105,000/turn x 10 turn/5 years)	Package	2,205.00	10	22,050.00		22,050.00
3.5.2	Management and coordination activities of the Program ($1,000,000/year x 5 years)	Package	21,000.00	5	105,000.00	105,000.00	

No.	ACTIVITY	UNIT	COST	QUANTITY	TOTAL BUDGET	Proposed Source	
						GoV	ODA
3.5.3	Strengthening multilevel coordination capacity through pandemic preventing rehearsal $100,000/year x 5 years	Simulation	2,100.00	5	10,500.00	10,500.00	
3.5.4	Completing, editing Legal document$ 50,000/year x 5 years	Package	1,050.00	5	5,250.00	5,250.00	
3.6	**Other Activities**						
3.6.1	Scientific research including epidemiology, virology, prevention measures, communication (10 research studies x $500,000)	Study	10,500.00	10	105,000.00	52,500.00	52,500.00
3.6.2	Research on vaccine (experimental vaccine production…)	Study	147,000.00	1	147,000.00	73,500.00	73,500.00
3.6.3	Review on result and impact (Annual, mid-term and end-term consulting and monitoring advisor of project. $100,000/turn x 10 turns/5 years)	Study	2,100.00	10	21,000.00	10,500.00	10,500.00
	Component III TOTAL				**3,856,646.85**	**1,414,733.25**	**2,441,913.60**
	OVERALL TOTAL for 2011-2015				**8,069,162.85**	**3,789,665.25**	**4,279,497.60**

Detailed cost estimate for the period 2011-2015 (USD)

Exchange rate: 1 USD = 21,000 VND

No.	ACTIVITY	UNIT	COST	QUANTITY	TOTAL BUDGET	Proposed Source	
						GoV	ODA
	COMPONENT I – Enhanced Coordination Activities						
1.1	**Overall Central Coordination of the Program**						
1.1.1	Steering Committee for Avian Influenza Prevention and Control	Year	10,000	5	50,000	50,000	
1.1.2	Steering Committee for Human Pandemics Prevention and Control	Year	10,000	5	50,000	50,000	
1.1.3	Joint annual review and strategic planning for the animal health sector, human health sector and related sectors	Meeting	10,000	5	50,000		50,000
1.2	**Overall Provincial Coordination of the Program**						
1.2.1	Steering Committee for Avian Influenza Prevention and Control	Year	5,000	5	25,000	25,000	
1.2.2	Steering Committee for Human Pandemics Prevention and Control	Year	5,000	5	25,000	25,000	
1.2.3	Joint annual review and strategic planning for the animal health sector, human health sector and related sectors	Meeting	5,000	5	25,000	15,000	10,000
1.3	**Support to Donor Coordination**						
1.3.1	Annual Plenary meeting of the Partnership	Meeting	10,000	5	50,000		50,000
1.3.2	Support to quarterly BCC Working Group meetings	Meeting	2,500	20	50,000		50,000
1.3.3	Other policy and technical meetings of the Partnership	Meeting	5,000	20	100,000		100,000
1.3.4	PAHI Secretariat office rental monthly estimate x 5 years)	Rent	800	60	48,000	48,000	
1.3.5	PAHI Secretariat personnel and operations	Annual estimate	120,000	5	600,000		600,000
1.4	**Overall Program Monitoring and Evaluation**						
1.4.1	Capacity development on overall monitoring	Year	80,000	5	400,000		400,000
1.4.2	Annual consolidated monitoring report	Year	20,000	5	100,000	50,000	50,000
1.4.3	Mid-term review	Package	200,000	1	200,000		200,000
1.4.4	Final review	Package	200,000	1	200,000		200,000
1.5	**Support for Regional Coordination**						
1.5.1	Participation in key overall regional and international	Trip	10,000	15	150,000		150,000

No.	ACTIVITY	UNIT	COST	QUANTITY	TOTAL BUDGET	Proposed Source	
						GoV	ODA
	meetings (3 meetings per year x delegation of 4 officials x 5 years)						
	Component I TOTAL				**2,123,000**	**263,000**	**1,860,000**
	COMPONENT II - HPAI control and eradication and strategy for emerging infectious diseases in the Agricultural Sector						
	Strengthening Veterinary and Animal Production Services						
2.1	**Veterinary services**						
2.1.1	***Central veterinary administration***						
	Base salaries and allowances, local travel and office accommodation for senior staff	Year	40,000	5	200,000	200,000	
	Preparation of a consolidated plan for strengthening of veterinary services	Plan	100,000	1	100,000	20,000	80,000
	Development of a veterinary statutory body	Package	150,000	1	150,000	30,000	120,000
	Attendance of senior staff at appropriate international and regional meetings	Package	60,000	5	300,000	60,000	240,000
	Development and passage of appropriate comprehensive animal health legislation	Laws	200,000	1	200,000	40,000	160,000
	Further assessment of veterinary services (PVS process)	Assessment	30,000	1	30,000	0	30,000
2.1.2	***Veterinary laboratory services***						
	Base line resources for operation of veterinary laboratories (utilities, permanent staff, building maintenance, supply of essential reagents)	Laboratory	425,000	8	3,400,000	680,000	2,720,000
	Organisation of one laboratory network meeting per annum	Meeting	25,000	5	125,000	37,500	87,500
	Construction of two new veterinary laboratories	Laboratory	15,000,000	2	30,000,000	21,000,000	9,000,000
	Finalising formal accreditation of all national and regional laboratories, including on-going international technical support for accreditation and compliance testing	Laboratory	150,000	8	1,200,000	360,000	840,000
	Renovation of existing regional centre laboratories to ensure their biosafety	Laboratory	150,000	8	1,200,000	400,000	800,000
	Employment of contract staff to conduct additional testing	Person-	300	1,920	576,000	172,800	403,200

No.	ACTIVITY	UNIT	COST	QUANTITY	TOTAL BUDGET	Proposed Source	
						GoV	ODA
	for avian influenza and other emerging infectious diseases	Month					
	Full program of calibration and maintenance and replacement/upgrading for existing equipment	Package	500,000	5	2,500,000	0	2,500,000
	Reagents for additional surveillance and diagnostic testing for avian influenza and emerging infectious diseases	Package	120,000	40	4,800,000	960,000	3,840,000
	Post-graduate training for veterinary pathologists and case managers	Persons	120,000	8	960,000	0	960,000
	Additional training on new laboratory techniques and detection methods for new pathogens	Package	1,000,000	1	1,000,000	0	1,000,000
	Review of plans of proposed veterinary laboratories by international experts in laboratory planning and construction	Package	200,000	1	200,000	0	200,000
	Additional laboratory network meetings	Package	40,000	5	200,000	0	200,000
	Recognition of RAHO-6 as ASEAN regional reference laboratory for Classical swine fever	Package	100,000	1	100,000	0	100,000
2.1.3	***Veterinary field services***						
	Baseline funding for staff provided by national and provincial authorities and for standard and limited emergency field operations	Person-Month	50	75,600	3,780,000	1,134,000	2,646,000
	Payment of a small allowance for selected commune-based veterinary paraprofessionals to conduct government-related activities	Person-Month	30	113,400	3,402,000	340,200	3,061,800
	Delineating the responsibilities of public and private sector veterinarians and paraprofessionals and building of public-private partnerships for delivery of veterinary services	Package	100,000	1	100,000	0	100,000
	Conducting a review of the status of epidemiology units at provincial (SDAH) and regional (RAHO) levels to establish the best way to provide appropriate epidemiological services	Package	50,000	1	50,000	0	50,000
	A system for replacement of vehicles as they reach the end of their working life	Vehicle	50,000	60	3,000,000	0	3,000,000
	Formal training in basic and advanced epidemiology, surveillance and disease investigations through the form of	Course	30,000	20	600,000	0	600,000

No.	ACTIVITY	UNIT	COST	QUANTITY	TOTAL BUDGET	Proposed Source	
						GoV	ODA
	AVET or similar training programme where the focus will also be placed on improved data analysis and interpretation						
	Strengthening of undergraduate veterinary training especially in the areas of disease investigations and epidemiology, including establishment of twinning relationships with overseas universities	Person	150,000	7	1,050,000	0	1,050,000
2.1.4	***Quarantine/border services***						
	Baseline salaries and maintenance of existing facilities	Station	30,000	60	1,800,000	900,000	900,000
	Improved and new border control stations	Station	50,000	5	250,000	75,000	175,000
	Training for border control staff	Person	5,000	34	170,000	85,000	85,000
	Regional and bilateral meetings to enhance cross border liaison for trans-boundary diseases	Meeting	30,000	15	450,000	225,000	225,000
	Additional studies in border areas to understand drivers of cross-border trade (including illegal trade)	Package	100,000	1	100,000		100,000
2.1.5	***Veterinary public health services***						
	Basic salaries and allowances for staff to undertake current core activities, including work in markets and slaughterhouses	Person-Month	200	75,600	15,120,000	13,608,000	1,512,000
	Additional training in meat inspection and slaughterhouse hygiene	Person	1,000	1,260	1,260,000	630,000	630,000
	Enhancement of laboratory capacity in food testing laboratories	Laboratory	500,000	10	5,000,000	4,000,000	1,000,000
	Enhanced capacity to regulate the use of antimicrobial compounds in animals	Package	450,000	10	4,500,000	3,600,000	900,000
	Additional training on safety and outbreak notification for commune and village extension staff	Package	150,000	1	150,000	0	150,000
2.1.6	**Strengthening of animal production services**						
	Salaries and basic allowances for national staff in DLP, central extension staff and livestock extension staff employed by provincial departments	Year	100,000	1	100,000	100,000	
	Review of scope of animal production services required by the livestock sector (public and private) and the current	Package	100,000	1	100,000		100,000

No.	ACTIVITY	UNIT	COST	QUANTITY	TOTAL BUDGET	Proposed Source	
						GoV	ODA
	status of these services (using a process aligned with the OIE gap analysis for veterinary services) including shortfalls in manpower and ways to provide support to the developing livestock sector						
	Support for training in spatial planning and developing and assessing livestock development plans	Package	300,000	1	300,000		300,000
	Training in farm biosecurity for animal production staff (including biosecurity standards and conduct of audits)	Package	200,000	1	200,000		200,000
	Train on implementation, surveillance, evaluation of traceability system	Package	200,000	1	200,000		200,000
	Revision of and training in application of GAHPs for livestock farms of different sizes	Package	400,000	1	400,000		400,000
	Support to strengthen the public-private relationship in livestock						
	1. Assess the role of the private sector in seed production, animal food, veterinary services and agricultural extension	Package	100,000	1	100,000		100,000
	2. Support institutional development to promote public-private in livestock production	Package	100,000	1	100,000		100,000
	3. Annual training, conference, workshop in regional, national and international level	Package	200,000	1	200,000		200,000
2.2	**Disease Control and Prevention**						
2.2.1	Basic salaries and allowances and equipment for staff involved in rapid response to disease outbreaks and existing control and preventive programs including vaccination programs	Person-Month	150	18,900	2,835,000	850,500	1,984,500
2.2.2	Vaccines for targeted vaccine programs for selected major animal diseases	Package	15,000,000	5	75,000,000	60,000,000	15,000,000
2.2.3	Updates of national disease control and prevention plans for all major diseases	Package	75,000	3	225,000	45,000	180,000
2.2.4	Replacement/replenishment of emergency supplies of PPE and materials for cleaning and disinfection	Package	300,000	5	1,500,000	300,000	1,200,000
2.2.5	Additional training in appropriate methods of cleaning and disinfection	Course	35,000	20	700,000	210,000	490,000

No.	ACTIVITY	UNIT	COST	QUANTITY	TOTAL BUDGET	Proposed Source	
						GoV	ODA
2.2.6	International support for review of vaccination/disease control and prevention strategies	Mission	85,000	5	425,000		425,000
2.2.7	Applied research into vaccination against important infectious diseases (including improved vaccines and vaccination strategies)	Package	250,000	5	1,250,000	250,000	1,000,000
2.2.8	Mock outbreak responses at commune level	Simulation	25,000	20	500,000		500,000
2.2.9	Replacement of supplies for vaccinators (provided by donors from 2005)	Package	2,500	700	1,750,000	525,000	1,225,000
2.2.10	Implementation of compartments for the poultry sector	Compartment	25,000	100	2,500,000		2,500,000
2.2.11	Provincial plans for disease control prevention and elimination, starting initially with HPAI.	Plan	10,000	45	450,000		450,000
2.2.12	Applied research into avian influenza and emerging infectious diseases, focusing on key gaps in knowledge that currently hinder control, prevention and rapid identification of these diseases,	Study	300,000	5	1,500,000	450,000	1,050,000
2.2.13	Maintaining links to international agencies and academic institutions and related programs such as GFTADS, SEAFMD at the operational level.	Meeting	75,000	5	375,000		375,000
2.2.14	Review of existing examples of livestock health programs developed for or by small-scale producers and to develop additional commune- or village- based activities, based on these or other suitable models.	Package	50,000	1	50,000		50,000
2.2.15	Review of existing MARD technical transfer activities towards biosecurity, strengths, weaknesses and constraints.	Package	20,000	1	20,000	0	20,000
2.2.16	Training agricultural extension staff as an efficient reserve force for disease control and prevention (pilot in 7 selected provinces).	Package	30,000	1	30,000	0	30,000
2.3	**Surveillance and Epidemiological Investigations**						
2.3.1	Appropriate post vaccination monitoring of the response to vaccination in poultry	Round	300,000	10	3,000,000	900,000	2,100,000
2.3.2	Submission of samples from disease outbreaks in livestock and other animals	Sample	50,000	5	250,000	250,000	
2.3.3	Disease outbreak investigations for avian influenza	Investigation	5,000	100	500,000		500,000

No.	ACTIVITY	UNIT	COST	QUANTITY	TOTAL BUDGET	Proposed Source	
						GoV	ODA
	(including joint investigations with human health staff) and other important infectious diseases						
2.3.4	Appropriate active surveillance in selected markets and slaughterhouses for avian influenza viruses to demonstrate changes in levels of infection over time	Market	3,000	200	600,000		600,000
2.3.5	Appropriate surveillance in wild animals for infectious agents and studies of wild animal trade to identify key areas of risk	Survey	300,000	2	600,000		600,000
2.3.6	Improvements to databases used for recording and reporting surveillance and disease investigations	Database	800,000	1	800,000		800,000
2.3.7	Additional training for front line veterinary paraprofessionals in identification and reporting of disease outbreaks by clinical syndrome,	Person	1,000	1,200	1,200,000		1,200,000
2.3.8	Additional studies on incentives for disease reporting including compensation systems so as to improve reporting systems	Study	50,000	2	100,000		100,000
2.3.9	Appropriate surveillance to demonstrate on-going freedom from infection with H5N1 HPAI in compartments and other enterprises	Survey	75,000	5	375,000		375,000
2.3.10	Additional training in disease investigations and epidemiology (see A1)	Person	2,500	300	750,000		750,000
2.3.11	Development and implementation of appropriate provincial surveillance plans	Plan	7,000	25	175,000		175,000
2.3.12	Improved modelling of selected diseases based on better quality field data	Study	75,000	5	375,000		375,000
2.3.13	Studies into production and market chains to establish key risk points for disease transmission and persistence	Study	120,000	3	360,000		360,000
2.4	**Modifications to the Livestock Sector**						
2.4.1	Preparation and review of national and provincial plans for the livestock sector	Package	500,000	1	500,000		500,000
2.4.2	Operation of the Biosecurity Working Group	Package	100,000	1	100,000		100,000
2.4.3	Development of and training in biosecurity standards and biosecurity audits	Package	100,000	1	100,000		100,000

No.	ACTIVITY	UNIT	COST	QUANTITY	TOTAL BUDGET	Proposed Source	
						GoV	ODA
2.4.4	Development of improved biosecurity plans for livestock planning zones	Package	200,000	1	200,000		200,000
2.4.5	Upgrading of slaughterhouses and retail markets (DAH activity)	Package			0		
2.4.6	Modification and application of GAHPs and GAHP certification (especially modification of GAHPs for small-scale producers)	Package	200,000	1	200,000		200,000
2.4.7	Implementation of appropriate waste treatment systems on livestock farms	Package	1,100,000	1	1,100,000		1,100,000
2.4.8	Introducing practical livestock identification systems that allow tracing of poultry and other livestock from farms to wholesale markets or slaughterhouses	Package	100,000	1	100,000		100,000
2.4.9	Risk management in free grazing duck production in Mekong Delta						
	1. Assess the status of breeding duck in Mekong Delta after 7 years avian influenza occurred	Study	200,000	1	200,000		200,000
	2. Assess the implementation of government regulations on free grazing duck production	Study	100,000	1	100,000		100,000
	3. Additional research on management initiatives and additional regulations on management of duck breeding	Study	80,000	1	80,000		80,000
	4. Management capacity building for the local livestock staff (training, conferences and workshops at national and international level on management experience in breeding duck)	Package	200,000	1	200,000		200,000
	5. Training and modelling of controlled duck breeding	Package	500,000	1	500,000		500,000
	6. Organizing the conference to review the implementation results (regional, national level)	Package	100,000	1	100,000		100,000
2.4.10	Supporting to innovate hatching system						
	1. Assessing the status of hatching all over the country	Study	200,000	1	200,000		200,000
	2. Assessing the implementation of government regulations on hatching system	Study	100,000	1	100,000		100,000
	3. Additional research on management initiatives and additional regulations on management of hatching system	Study	50,000	1	50,000		50,000

No.	ACTIVITY	UNIT	COST	QUANTITY	TOTAL BUDGET	Proposed Source	
						GoV	ODA
	4. Management capacity building for local livestock staff (training, conference, workshops at national level on management experience in hatching)	Package	150,000	1	150,000		150,000
	5. Training and modelling of poultry hatching	Package	400,000	1	400,000		400,000
	6. Organizing conference to review the implementation results	Package	100,000	1	100,000		100,000
2.4.11	Supporting to risk management in raising domesticated wild animals						
	1. Assessing demand and potential of developing domesticated wild animal production	Package	200,000	1	200,000		200,000
	2. Assessing potential risks of arising infectious disease in wild animal	Package	200,000	1	200,000		200,000
	3. Training and instructions to apply the technical measures in domesticated wild animals production	Package	100,000	1	100,000		100,000
	4. Pilot model	Package	300,000	1	300,000		300,000
	5. Organizing conference to review the implementation results and replication	Package	100,000	1	100,000		100,000
2.4.12	Managing the risk of livestock waste to ensure disease security	Package	1,100,000	1	1,100,000		1,100,000
2.5	**Public Awareness and Behavioural Change**						
2.5.1	Annual publicity campaigns during high risk periods and in areas where vaccination campaigns are being modified	Campaign	250,000	5	1,250,000	375,000	875,000
2.5.2	Review of BCC campaigns and programs including school based programs to determine which methods warrant replication	Review	30,000	5	150,000		150,000
2.5.3	Development of appropriate communication Package to discourage butchering of dead or sick poultry	Package	125,000	5	625,000		625,000
2.5.4	Improve communication activities through central and local agricultural extension system	Package	20,000	1	20,000	2,000	18,000
2.5.5	Development of appropriate extension and training Package for slaughterhouse and market workers on disease control and prevention and hygiene measures	Package	250,000	7	1,750,000		1,750,000
2.5.6	Capacity building for local veterinarian and commune,	Package	200,000	1	200,000	10,000	190,000

No.	ACTIVITY	UNIT	COST	QUANTITY	TOTAL BUDGET	Proposed Source	
						GoV	ODA
	district agricultural extension staff: • Capacity building for local veterinarian and commune agricultural extension staff (through training, visiting models…) • Communication training support for commune agricultural extension workers. • Developing sample clubs of village extension on biosecurity. Training village collaborators.						
2.5.7	Support training on GAHP for livestock production and role of farmers for community health (extension staff trains farmers: Develop pilot training programs, implementation, assessment, survey on the disease situation in humans and animals in 7 selected provinces)	Package	40,000	1	40,000	0	40,000
2.5.8	Development of some suitable key demonstration which ensure the disease control in livestock production chain.	Package	40,000	1	40,000	4,000	36,000
	Component II TOTAL				**198,473,000**	**112,829,000**	**85,644,000**
	COMPONENT III - Pandemic Preparedness and influenza and emerging infectious disease prevention in the Health Sector						
3.1	**Improving Capacity of the Surveillance and Response System from Central to Local Level**						
3.1.1	Training on implementation of law documents - 10 course x 6 year x $13,200/ course, including: + 2 days x $65 x 40 people/course + Travel: $5,000/course (including air ticket, travel by other public means) + Other cost: $3,000 (Meeting room, document, teacher, photocopy, stationary,...)	Course	13,200	60	792,000	792,000	
3.1.2	Develop video conference in ecological zones (7 zones x $40,000)	Package	40,000	7	280,000	280,000	
3.1.3	Conduct simulation exercises with preventive and curative fields AND human health and animal health in 50% of provinces (32 exercises x $25,000)	Exercise	25,000	32	800,000	500,000	300,000

No.	ACTIVITY	UNIT	COST	QUANTITY	TOTAL BUDGET	Proposed Source	
						GoV	ODA
3.1.4	Printing and disseminating materials and documents of surveillance (20 law documents x $10,000)	Package	10,000	20	200,000		200,000
3.1.5	Implementation of software for communicable disease surveillance system and new model of surveillance system						
	Upgrading the existing communicable disease surveillance system software ($6,000/year x 5 years)	Package	6,000	5	30,000		30,000
	Training on communicable disease surveillance software for preventive workers in all levels (275 training courses x $9990/course (air ticket $200, other cost $125/person x 30 people/course).	Course	9,750	275	2,681,250	1,681,250	1,000,000
	Maintaining internet network for regional, provincial, district levels (750 units x $2,000)	Unit	2,000	750	1,500,000	1,500,000	
	Providing computers and maintaining the internet network for surveillance at commune level 11,000 communes x $1,000/set 11,000 communes x $200 to maintain internet network	Commune	1,200	11,000	13,200,000	2,200,000	11,000,000
	Maintaining and updating Website of preventive health system ($20,000/year x 5 years).	Year	20,000	5	100,000	100,000	
3.1.6	Upgrading the online meeting room of GDPM and Institutes						
	Screen and standard equipment (front-end) for four Institutes, including the cost of installation, user manual and maintenance	Package	15,000	4	60,000		60,000
	52 inch television for 4 Institutes	Unit	1,650	4	6,600		6,600
	Cable internet fee for 4 institutes	Package	500	4	2,000	2,000	
	Monthly subscription for internet systems for 4 Institute $250 /month x 12 months x 5 years	Unit	250	72	18,000	18,000	
3.1.7	Retraining on surveillance system and pandemic response: report process, case detecting... (1,600 rapid response teams x 5 person/team x 2 turns/5 years x $300/person/year)	Person/Year	300	16,000	4,800,000	3,000,000	1,800,000
3.1.8	Provision of equipment for rapid response teams (RRT):						
	PPEs (1,600 RRT x 5 per/team x 100 set/5 years x $10/set)	Set/Team/ Year	160,000	50	8,000,000	4,000,000	4,000,000

No.	ACTIVITY	UNIT	COST	QUANTITY	TOTAL BUDGET	Proposed Source	
						GoV	ODA
	Vehicles for outbreak investigation (620 districts x $35,000)	Vehicle	35,000	620	21,700,000		21,700,000
	Pickup trucks for spraying chemicals (40 vehicles for provinces or institutes with no vehicles x $20,000)	Vehicle	20,000	40	800,000		800,000
	Specimen collection kits, diagnosis kits (1,600 RRTs x 1,000 set/5 years x $15/set)	Set	1,600,000	15	24,000,000		24,000,000
3.1.9	Develop the FETP training program in Vietnam						
	Consulting on developing FETP program: development orientation 2011-2015	Person	30,000	2	60,000	60,000	
	Organizing short term FETP course (30 short term training course/years x $10,000/course x 5 year)	Course	10,000	150	1,500,000		1,500,000
	Organizing long-term FETP course (2 year) 10 long-term course/year x $40,000/course x 5 year	Course	40,000	50	2,000,000		2,000,000
3.1.10	Organizing International and local information sharing workshops:						
	International workshops held in Vietnam (5 workshops x $50,000)	Workshop	50,000	5	250,000		250,000
	Study tours abroad (3 courses/5years x $50,000/course)	Course	50,000	3	150,000		150,000
3.1.11	Strengthening border health quarantine system:						
	Provision of essential equipment for International Health Quarantine Centres (13 centres x $100,000)	Centre	100,000	13	1,300,000		1,300,000
	Training on border health quarantine (3 courses/5 years x 2 turns/5 year x $25,000)	Course	25,000	6	150,000	150,000	
3.1.12	Improvement of quality of laboratories:						
	Procurement of PCR capacity (35 provinces without PCR x $100,000/set)	Set	100,000	35	3,500,000		3,500,000
	Training on improvement of labs (12 courses/ 5 years x $25,000)	Course	25,000	12	300,000		300,000
	Training on applying QAS for local levels $50,000/year x 5 years	Course	50,000	5	250,000		250,000
3.2	**Improving Treatment capacity of Provincial and District Hospitals**						
3.2.1	Training to improve diagnostic and treatment skills of	Course	400	4,800	1,920,000	1,920,000	

No.	ACTIVITY	UNIT	COST	QUANTITY	TOTAL BUDGET	Proposed Source	
						GoV	ODA
	health workers, especially at district level (800 units x 3 per each x 2 turns/ 5 years x $400)						
3.2.2	Training to improve hospital infection control capacity (800 units x 2 per each x 2 turns/ 5 years x $400)	Course	400	3,200	1,280,000	1,280,000	
3.2.3	Upgrading isolation rooms for provincial and district hospitals (55 units x $30,000)	Package	30,000	55	1,650,000	650,000	1,000,000
3.2.4	Provision of medical equipment for AI treatment for provincial and district hospitals (55 units x $300,000)	Set	300,000	55	16,500,000	9,900,000	6,600,000
3.2.5	Organize the inspection and supervision of monitoring and statistical reporting implementation of infectious diseases in hospitals, medical facilities nationwide to ensure strict implementation of Circular No. 48 / 2010/TT-BYT dated 31/12/2010 of the Minister of Health (team of 5-7 central and local health care managers over 5 years)	Year	20,000	5	100,000	100,000	
3.3	**Strengthening Capacity of the Local Preventive Medicine System**						
3.3.1	Strengthening district preventive medicine system using the VAHIP model in all remaining districts (240 districts x $200,000/district)	District	200,000	240	48,000,000	24,000,000	24,000,000
3.4	**Strengthening Behaviour Change Communication**						
3.4.1	Improving the knowledge and communication skills of health workers in hospitals and preventive health units (63 provinces x $10,000/ 5 years)	Package	10,000	63	630,000	315,000	315,000
3.4.2	Conducting community AI communication campaigns (63 provinces x $20,000/year x 2 turns/ 5 years)	Campaign	20,000	126	2,520,000	1,260,000	1,260,000
3.4.3	Training to improve communication capacity and skills for community based communicators - TOT. (63 provinces x $20,000/year x 2 turns/ 5 years)	Course	20,000	126	2,520,000	1,260,000	1,260,000
3.4.4	IEC printing and distribution (630,000 materials/turn x $30,000/turn x 10 turns)	Package	30,000	10	300,000	150,000	150,000
3.5	**Strengthening Coordination**						
3.5.1	Support for surveillance and emergency pandemic prevention and response(periodical consulting and	Package	105,000	10	1,050,000		1,050,000

No.	ACTIVITY	UNIT	COST	QUANTITY	TOTAL BUDGET	Proposed Source	
						GoV	ODA
	monitoring advisor, $105,000/turn x 10 turn/5 years)						
3.5.2	Management and coordination activities of the Program ($1,000,000/year x 5 years)	Package	1,000,000	5	5,000,000	5,000,000	
3.5.3	Strengthening multilevel coordination capacity through pandemic preventing rehearsal $100,000/year x 5 years	Simulation	100,000	5	500,000	500,000	
3.5.4	Completing, editing Legal document $50,000/year x 5 years	Package	50,000	5	250,000	250,000	
3.6	**Other Activities**						
3.6.1	Scientific research including epidemiology, virology, prevention measures, communication (10 research studies x $500,000)	Study	500,000	10	5,000,000	2,500,000	2,500,000
3.6.2	Research on vaccine (experimental vaccine production…)	Study	7,000,000	1	7,000,000	3,500,000	3,500,000
3.6.3	Review on result and impact (Annual, mid-term and end-term consulting and monitoring advisor of project. $100,000/turn x 10 turns/5 years)	Study	100,000	10	1,000,000	500,000	500,000
	Component III TOTAL				**183,649,850**	**67,368,250**	**116,281,600**
	OVERALL TOTAL for 2011-2015				**384,245,850**	**180,460,250**	**203,785,600**

IHR Monitoring Framework: Checklist and Indicators for Monitoring Progress in the Implementation of IHR Core Capacities in States

Parties Processes and Outputs

INTRODUCTION

Following the entering into force of the IHR (2005) on 15 June 2007, all States Parties are required to have or develop minimum core public health capacities. To this end, WHO, partners and selected Member States representing all WHO regions have developed a framework for States Parties to monitor the development of their core capacities at the national, intermediate and local community and primary response levels, in accordance with the requirements for core capacity development in Annex 1 of the IHR (2005). This framework has also taken into account Article 54 of the IHR (2005), which calls on States Parties to report on the implementation of the IHR to the World Health Assembly.

The framework represents a consensus of technical expert views drawn globally from WHO Member States, technical institutions, partners, and from within WHO for this purpose. It incorporates current knowledge as well as concepts that have been successfully applied in monitoring capacity development activities. The framework builds particularly on experts' knowledge of current capacities of States Parties, existing regional and country strategies for capacity development, and other available resources and tools, particularly other tools used for IHR core capacity assessment by States Parties.

Wherever possible, data should be collected through relevant regional programs and strategies, such as the Asian Pacific Strategy for Emerging Diseases (APSED) in Western Pacific Region and South East Asian Region, the Integrated Disease Surveillance and Response (IDSR) in the African region, the Emerging Infectious Diseases (EID) Strategies in Americas, and Eastern Mediterranean Regions and European Regional strategies.

The framework provides:

A set of 20 global indicators for monitoring the development of IHR core capacities for reporting annually to the World Health Assembly (WHA) by all States Parties (mandatory for all).

An additional 10 indicators for monitoring the comprehensive development, strengthening, and maintenance of States Parties' IHR core capacities (optional).

Countries are encouraged to report on all the 30 indicators. Only the 20 global (WHA) indicators will be used for the report to the Executive Board and the World Health Assembly. The tools developed for monitoring (checklist, indicators and

questionnaire) was pilot tested in all WHO regions (AFRO, AMRO, EMRO, EURO, SEARO; WPRO).

In developing the indicators the following criteria were applied:

1) Relevance to the IHR: The indicators and attribute must be relevant in advancing the objective of developing capacities to detect, assess, report, notify, verify and respond to public health events of national or international concern;
2) Coverage: The indicators and attributes reflect geographical coverage at the national, intermediate, and peripheral levels;
3) The scope of application in relation to the IHR relevant hazards: Biological (infectious, zoonotic and foodborne human pathogens) chemical, radiological and nuclear hazards;
4) The quality of the function or service: Quality refers to compliance with national and international standards and procedures applied;
5) The timeliness of application of functions and services;
6) The documentation and dissemination of practices.

This monitoring process is not intended for use as a tool to rank the performance of countries or to compare performance between countries. Rather, it is intended as a tool to assist individual countries monitor progress towards meeting the core capacity requirement of the IHR.

The Core Capacities, Hazards and Points of Entry

The IHR monitoring process involves the assessment of implementation of eight core capacities through a checklist of indicators specifically developed for monitoring each core capacity, capacities development at points of entry and capacities development for the four IHR-related hazards (zoonotic, food safety (considered as biological), chemical, radiological and nuclear). These core capacities are an interpretation by a technical group of experts of the IHR 2005 capacity requirements. They reflect the operational meaning of the capacities required to detect, assess, notify and report events, and to respond to public health risks and emergencies of national and international concern. They are notably:

- Core capacity 1: National legislation, policy and financing
- Core capacity 2: Coordination and National Focal Point (NFP) Communications
- Core capacity 3: Surveillance
- Core capacity 4: Response:
- Core capacity 5: Preparedness
- Core capacity 6: Risk communication
- Core capacity 7: Human resources
- Core capacity 8: Laboratory include:

A set of questionnaires with questions addressing all the attributes associated with the core capacities and hazards has been developed to replace the States Parties Questionnaire and will be distributed to countries each year.

Data Analysis:

For each core capacity, four distinct capability levels have been characterized:

- **Capability Level (<1)** is the foundational or "Prerequisite1" level which represents the critical attributes that would facilitate the implementation of the IHR.
- **Capability Level 1** is generally characterized as a moderate level with "Inputs and Processes" needed to achieve IHR core capacities largely in place.
- **Capability Level 2** is characterized as a strong level of capability, with outputs and some outcomes in place.
- **Capability Level 3** reflects contributions to the global achievement of IHR core capacities beyond a States Party's own borders.

States Parties are expected to achieve levels 1 and 2 by 2012 to meet the core capacity requirements. The WHO Director General may grant an extension of this deadline for up to a maximum of 4 years.

Reports and Information Products

The reports for each country will give an indication of their status in implementing the IHR at a point in time, as well as progress over time for each of the 8 core capacities, hazards and PoE. These would include:

- Individual detailed country reports (Recipients: Country IHR-NFP, WHO Country Office, Regional Office and HQ)
- Progress report of individual States Parties by core capacities; temporal comparison of progress within individual core capacity (Recipients: Country IHR-NFP, WHO Country Office, WHO RO, HQ)
- WHO Regional Office aggregate report of countries in the specific region (Recipients: WHO Regional Office)
- Aggregate progress report of State Parties (Recipients: World Health Assembly, Executive Board Members, WHO)

Country profiles on the status of core capacities as well as charts, graphs, and Geographic Information Systems (GIS) - based visualizations (maps) will be available. Countries and WHO will have access to this information. Each country will be able to access only the country's data.

The following 20 indicators have been selected for reporting to WHA:

	IHR (2005) INDICATOR	COMMENTS ON PROGRESS
1	Laws, regulations, administrative requirements, policies or other government instruments in place are sufficient[1] for implementation of obligations under the	Translation of policies, guidelines into practice

	IHR (2005) INDICATOR	COMMENTS ON PROGRESS
	IHR	
2	A mechanism is established for the coordination of relevant sectors[2] in the implementation of the IHR	Streamlined mechanisms need to be tested for non-health sector responses
3	IHR National Focal Point functions and operations are in place as defined by the IHR (2005)	In place but need testing and evaluation
4	Indicator based, routine, surveillance includes an early warning[3] function for the early detection of public health events	Not comprehensive
5	Event based surveillance is established	Needs evaluation, increased coverage, improved timeliness (increased scope to include food borne pathogens, chemical & radiological threats)??
6	Public health emergency response mechanisms are established	Detailed plans are limited to the health sector although the 209 pandemic action plan does outline communications, roles and responsibilities of other key coordinating ministries, unions and the Vietnam Red Cross
7	Infection prevention and control is established at national and hospital levels	Limited implementation of national guidelines
8	A Multi-hazard National Public Health Emergency Preparedness and Response Plan has been developed	Not yet incorporated with Disaster Response System
9	Public health risks and resources are mapped	Not done. Needs to be done in combination with Agricultural sector and other relevant sectors (Forestry, Fisheries, Development etc)
10	Mechanisms for effective risk communication during a public health emergency are established	Partly. Need evaluation and further development
11	Human resources are available to implement IHR core capacity requirements	Likely inadequate reflecting general HR shortage within health sector and need for applied epidemiology and disaster management training
12	Laboratory services to test for priority health threats are available and accessible	Partly.
13	Laboratory bio-safety and bio-security practices are in place	? See US-CDC review. Note lower bio-security available for animal health specimen processing cf human health specimens
14	Effective surveillance is established at points of entry[4]	Surveillance needs to extend beyond just PoE for zoonotic threats involving domestic animals given long, porous borders
15	Effective response is established at points of entry	?
16	General obligations at points of entry are fulfilled	?
17	Mechanisms are established for detecting and responding to zoonoses and potential zoonoses	Requires streamlined communications, coordination and training of animal and human health actors; involvement of private sector; consideration of upstream determinants to comprehensively address vulnerabilities and risk
18	Mechanisms are established for detecting and responding to foodborne disease and food contamination	No. Potentially an emerging issue with regard to infections of meat products.
19	Mechanisms are established for detection, alert and response to chemical emergencies	An all hazards approach is not yet embraced by existing government structures in Vietnam and so not yet relevant for this document
20	Mechanisms are established for detecting and responding to radiological and nuclear emergencies	An all hazards approach is not yet embraced by existing government structures in Vietnam and so not yet relevant for this document

1 Sufficient means that they allow for fulfilment of obligations.

2 Relevant sectors and disciplines include, for example, all levels of the health care system (local community, primary public health response, intermediate and national/central levels) NGOs, and ministries of agriculture (zoonosis, veterinary laboratory), transport (transport policy, civil aviation, ports and maritime transport), trade and/or industry (food safety and quality control), foreign trade (consumer protection, control of compulsory standard enforcement), communication, defence (information about migration flow), treasury or finance (customs) of the environment, the interior, home office, health and tourism.

3 The early warning component detects departures from normal.

4 Points of entry surveillance is considered as part of the national surveillance system or as otherwise defined by the country.

ANNEX VI HANOI DECLARATION FROM IMCAPI 2010

Hanoi Declaration

At the International Ministerial Conference: "Animal and Pandemic Influenza: The Way Forward", Hanoi, Vietnam, 19-21 April 2010 - IMCAPI Hanoi 2010

PREAMBLE

The International Ministerial Conference on Animal and Pandemic Influenza was convened in Hanoi, Vietnam, on 19 - 21 April 2010. Hosted by the Government of Vietnam, in coordination with the European Union and the United States of America, with the support of the UN System Influenza Coordination and international organizations, the conference was attended by representatives of 71 countries and regional bodies around the world and representatives of international technical organizations, development banks and other stakeholders within the development community. The conference convened only a few days after the Eyjafjallajökull volcano eruption in the north of Europe, which disrupted global air travel. Nevertheless, great spirit on the part of both delegations and organizers, the use of technologies, and support from diplomatic corps assured representation to the fullest extent possible.

This conference built on a series of preceding international ministerial conferences and senior officials meetings since 2005, which have provided a platform for an unprecedented coordination in planning and action to respond to highly pathogenic avian influenza (HPAI) caused by the A/H5N1 strain, to prepare for a possible influenza pandemic and to strengthen jointly animal and human health systems on a long-term basis.

In addition, the conference noted the emergence of the first pandemic of the 21st century, caused by a new subtype of the A/H1N1 influenza virus, regretting the suffering and deaths caused by pandemic (H1N1) 2009, noting in particular the impact on young adults and pregnant women, young children, indigenous peoples, people with chronic conditions, and those with limited access to health care. The conference identified and discussed lessons learned from pandemic (H1N1) 2009.

The global experience with H5N1 HPAI and pandemic (H1N1) 2009 has reaffirmed the importance of international and regional cooperation, national political commitment, inter-sectoral collaboration, timely and transparent communication, and capacity building as essential to build a health system which is capable to address emerging threats, such as animal and human influenza, and to ensure effective pandemic readiness and response across different sectors. National experiences during the pandemic (H1N1) 2009 have reinforced the need for sustained, well-coordinated, multi-sector, multi-disciplinary, community-based actions to address high impact disease threats that arise at the animal-human-environment interface.

The continued threat of H5N1 HPAI to animal health, livelihoods, and human health in affected communities illustrates that despite progress in controlling influenza, the potential remains for influenza viruses to become more virulent through mutations

or exchanges of genetic material. This may result in a severe pandemic. The ongoing pandemic (H1N1) 2009 demonstrates the capacity for rapid global spread of influenza viruses, and still has the potential to become more pathogenic. Additional animal and human health policies for early detection systems and control measures will need to be developed and sustained at national and international levels for the foreseeable future. Moreover, effective metrics and policy analysis for evaluating such actions need to be developed and consistently applied.

The majority of high impact infectious diseases that have recently affected humans have arisen at the animal-human-environment interface. A number of existing diseases which emerge from this interface significantly burden animal and human health, livelihoods, and development. The effort to control HPAI and to prepare for pandemics can serve as a useful example of the way forward not only for controlling such diseases, but also for building stronger and more responsive human and veterinary health systems and better aligning those sectoral policies in ways that encourage socio-economic development.

Recent experience of H5N1 HPAI and pandemic (H1N1) 2009 has confirmed the need for a sustained cross-sectoral policy and coordination to deal with serious threats that arise at the animal-human-environment interface. This approach, often referred to as "One Health", was addressed at the IMCAPI in New Delhi in 2007 and further promoted by Ministers at the IMCAPI in Sharm el-Sheikh in 2008. One Health is a first step towards improving health outcomes through incorporating human and animal health policies in all relevant sectors.

The surge in demand for health care services associated with pandemic (H1N1) 2009 has strained the health sector in many countries, especially in countries that face the dual challenge of limited resources and highly vulnerable populations, and negatively affected agriculture, business, education, travel, and tourism in some countries. This experience highlights the importance of understanding the cross-sectoral determinants of good health and a global commitment to fundamental, long-term, and systematic approach to building public health capacity, including surveillance, detection, and reporting, as well as reinforcing economic resilience. It highlights the importance of non-pharmaceutical interventions in pandemic preparedness and response. The experience with pandemic (H1N1) 2009 also demonstrates the importance of planning for proportionate, differentiated responses to allow for flexibility in responding to different scenarios in terms of virulence, geographic spread, and other factors. It reinforces the importance of including continuity planning for critical services and of addressing potential impacts in national disaster management plans.

Effective advocacy and communications at all levels need to be strengthened to better support decision-making, to ensure resource commitment, to promote understanding and appropriate assessments of the risks in animals and humans, and to enable effective engagement at the community level through behaviour changes and the adoption of protective practices.

The new challenge of the 21st century, "live again with infectious uncertainty and strengthen systems so they can respond to unpredictable health risks", calls for a thorough and carefully planned effort of sensitization and education.

WE, THE PARTICIPANTS IN THE CONFERENCE

1. Take note of the progress that has been achieved in global coordination and cooperation since the end of 2005 in the global response to highly pathogenic avian influenza (H5N1), and of the positive conclusions presented at this conference, and in independent evaluations of the overall H5N1 response.

2. Commend the ongoing consultations at all levels, as exemplified in particular by the technical meeting undertaken as part of this conference, to identify, inform, and promote efforts to improve global health.

3. Recognize the concerted efforts of the international community, including agencies of the United Nations system and other relevant international and regional organizations, countries, development and technical agencies, nongovernmental organizations, foundations, communities, the private sector, and other partners to prepare for and respond to the threat of pandemic influenza; emphasize the need to continue to enhance coordination at the international level and encourage countries and international partners to further promote information exchange on experiences, policies, guidelines, clinical data, and other aspects bilaterally, regionally and globally.

4. Express satisfaction that commitments first made by participants at the January 2006 Beijing conference, and reaffirmed at subsequent conferences, have had significant results, including: the development and implementation of national integrated action plans within the strategic framework of the World Health Organization, the Food and Agricultural Organization, and the World Organization for Animal Health; and the establishment of strategic partnerships between the international community and the countries affected or at risk of HPAI H5N1.

5. Renew our commitment to continue and reinforce this long-term partnership, by working within the United Nations system and through global, regional, and intercountry networks to increase our capacity and cooperation on surveillance systems, epidemiological research, antiviral and vaccine research and development, health and veterinary systems strengthening, as well as safe and resilient systems for food production, and to evaluate periodically our preparedness and action plans for pandemics.

6. Recognize that despite substantial progress in controlling H5N1 HPAI globally, the virus continues to circulate in domestic poultry in a number of countries, and to result in human infections and deaths.

7. Encourage countries and international partners, including agencies of the United Nations system, to remain vigilant and continue to share information with respect to emerging threats such as H5N1 HPAI, pandemic (H1N1) 2009, and other influenza viruses and to continue their efforts towards the control and elimination of H5N1 HPAI, while working to strengthen jointly human and animal public health systems and to evaluate such efforts by effective metrics.

8. Recognize that global preparations for H5N1 HPAI influenza largely contributed to coordination of the response to pandemic (H1N1) 2009.

9. Recognize the critical importance of learning lessons from the responses to H5N1 HPAI and pandemic (H1N1) 2009, including lessons from important learning events hosted by a number of countries and institutions as well as reviews and assessments that were shared at the conference, appreciate the risks associated with these viruses, and commit ourselves to considering to take further actions to avert H5N1 HPAI and increasing efforts to review pandemic preparedness plans using, where relevant, guidance and tools provided by the international technical agencies and the multilateral development banks; these country strategies should be aligned nationally and regionally to address the global "One Health" challenges.

10. Recognize that there is a need for the international community, led by the international technical agencies and development banks, to address the fundamental gaps in public health and animal health systems so as to reduce the impact of zoonoses, avert potential pandemics of animal origin, and mainstream investments and capacity in country health systems.

11. Call for increased efforts to strengthen early detection of, preparedness for, and rapid reporting of future events, by understanding the cross-sectoral nature of any threat, with particular focus on the health systems' capacity for rapid interdisciplinary action and coordination in line with the requirements outlined in IHR 2005 and the OIE standards on quality of Veterinary Services, with special attention devoted to develop and sustain such capacity in the least developed countries, to the needs of vulnerable groups, and to encourage the role of local communities as part of disease prevention and control programmes.

12. Call for the development of national strategies, plans, and interventions to stimulate whole-of-society, multi-sector, multi-disciplinary, and community-based actions when addressing disease threats that arise at the animal-human environment interface, stress the importance of business continuity planning in critical sectors, encourage all stakeholders to strengthen institutional and practical mechanisms to support cooperation and collaboration, and work to improve risk communication at all levels, in particular at the community level.

13. Underline the importance of implementing science-based public health measures and food safety international standards to minimize the potential economic and trade implications, and encourage countries to rapidly report disease outbreaks.

14. Reaffirm the critical role of communication, while reviewing the challenges in communications on pandemic (H1N1) 2009; enhance the efforts to better communicate with our populations, including the media, health services, and specific communities, to promote understanding of the risk, policy direction and necessary prevention measures, and to promote behaviour change, where necessary, through effective communication.

15. Call for constructive cooperation between governments and the private sector, as well as academia, on innovations leading to improved surveillance, prevention, and treatment, including on diagnostic reagents, vaccines, and medicines, always working within the relevant policy frameworks established by competent national authorities and WHO and OIE.

16. Finally, call for concerted worldwide efforts by all countries and relevant agencies of the United Nations system, and other international and regional partners, to better understand the emergence of disease threats at the animal-human environment interface through multi-sectoral actions, and to develop appropriate and sustainable means to reduce such threats.