TOWARDS ONE HEALTH:
Interim Lessons from the Global Program on Avian and Human Pandemic Influenza

SPONSORED BY
The Agriculture and Rural Development Department and the Human Development Network at the World Bank

HOSTED BY
The Ministry of Agriculture and Rural Development, and the Ministry of Health, Vietnam

June 30, 2011
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# Table of Contents

Acknowledgments .............................................................................................................................................. i  
Acronyms ........................................................................................................................................................ ii  
Preface ................................................................................................................................................................ iv  
Executive Summary ........................................................................................................................................ v  
Making One Health Operational .............................................................................................................. vii  
1. Setting the Scene ............................................................................................................................................ 1  
   The Learning Exchange Event .................................................................................................................... 3  
2. The Global Disease Challenge: Practical Lessons from the Case of Highly Pathogenic Avian Influenza ............................................................................................................. 5  
4. Select Lessons from Implementation Experience of GPAI Projects .................................................. 20  
   The Animal Health Component ............................................................................................................... 20  
   The Human Health Component ............................................................................................................... 29  
5. The One Health Concept ........................................................................................................................... 33  
6. Making One Health Operational ............................................................................................................... 38  
   Annex 1: Concept Note .................................................................................................................................. 50  
   Learning Exchange Event on Avian and Human Pandemic Influenza: The Way Forward .......... 50  
   Annex 2: Presentation at the 7th International Ministerial Conference on Animal and Pandemic Influenza: The Way Forward on April 19-21 in Hanoi................................................................. 53  
   Annex 3: List of Participants .......................................................................................................................... 55  
   Annex 4: Agenda .............................................................................................................................................. 58  
   Annex 5: Global Program for Avian Influenza Control and Human Pandemic Preparedness and Response (GPAI) and Avian and Human Influenza Facility (AHIF)......................................................... 61  
   Annex 6: Controlling H5N1 at the Source in Vietnam—the Red Book and the Green Book............ 64  
   Annex 7: The Africa Livestock Partnership ................................................................................................. 67  
   Annex 8: Eastern Europe and Central Asia Region Case Studies ............................................................ 69  
   Annex 9: Reporting on the Field Visits ........................................................................................................ 79  
   Annex 10: One Health Framework for Estimating the Economic Costs of Zoonotic Diseases on Society ........................................................................................................................................... 84  
   Annex 11: Avian and Human Influenza Projects ....................................................................................... 92
Annex 12: Evaluation Tools ........................................................................................................................... 94
Annex 13: Initial Experiences in Implementing One Health ............................................................................. 101
Annex 14: One Health Template ..................................................................................................................... 103
Annex 15: Selected One Health Follow-on Investments ................................................................................. 110
References ...................................................................................................................................................... 115

Tables

Table 1: Cumulative Number of Confirmed Human Cases of Avian Influenza A/(H5N1) Reported to WHO
Table 2: Regional Distribution of Different Funds for Animal and Human Influenza Control
Table 3: Knowledge, Attitudes and Practices Analysis

Figures

Figure 1: Effect of a Ban on Poultry Keeping on Household Income of Different Wealth Groups in Vietnam
Figure 2: Disbursement Performance of AHI Projects
Figure 3: One Health Concept
Figure 4: Vertical and Horizontal Orientation in Disease Prevention and Control
Figure 5: Delay in Disease Reporting/Cost of Control Relationship
Figure 6: The Performance of Veterinary Services Pathway
Figure 7: Hotspots of Potential Elevated Risk for Disease Outbreaks under El Niño Conditions: 2006-2007
Figure 8: Modified Risk Analysis Framework
Figure 9: Application of the Research Methods Toolkit on Brucellosis
Figure 10: Synoptic View of Benefits and Costs of Animal Brucellosis Mass Vaccination in Mongolia
Figure 11: Spreadsheet Model of the Costs and Benefits of Control Measures at the Institutional Level

Boxes

Box 1: Human Health Sector Systemic Constraints in Vietnam
Box 2: Animal Disease Control and Compensation Funds (ADCCF)
Box 3: Addressing Broader Developmental Issues through Follow-on One Health Investments
Box 4: Predicting Rift Valley Fever in Kenya
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# Acronyms

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>AAA</td>
<td>Analytical and Advisory Activities</td>
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<tr>
<td>ADCCF</td>
<td>Animal Disease Control and Compensation Funds</td>
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<tr>
<td>AHI</td>
<td>Avian and Human Influenzas</td>
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<tr>
<td>AHIF</td>
<td>Avian and Human Influenza Facility</td>
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<tr>
<td>ALive</td>
<td>Africa Livestock Partnership</td>
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<tr>
<td>APL</td>
<td>Adaptable Program Loan</td>
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<tr>
<td>ARD</td>
<td>Agriculture and Rural Development</td>
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<tr>
<td>AU-IBAR</td>
<td>African Union/Interafican Bureau for Animal Resources</td>
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<tr>
<td>BSL</td>
<td>Biosafety Level</td>
</tr>
<tr>
<td>AVSF</td>
<td>Agronomes et Vétérinaires sans Frontières</td>
</tr>
<tr>
<td>CBA</td>
<td>Cost-Benefit Analysis</td>
</tr>
<tr>
<td>CDC</td>
<td>Centers for Disease Control and Prevention (US)</td>
</tr>
<tr>
<td>CDD</td>
<td>Community Driven Development</td>
</tr>
<tr>
<td>CEA</td>
<td>Cost Effectiveness Analysis</td>
</tr>
<tr>
<td>CVO</td>
<td>Chief Veterinary Officer</td>
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<tr>
<td>DALY</td>
<td>Disability-Adjusted Life Years</td>
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<tr>
<td>DFID</td>
<td>UK Department for International Development</td>
</tr>
<tr>
<td>DLP</td>
<td>Department of Livestock Production</td>
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<tr>
<td>EC</td>
<td>European Commission</td>
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<tr>
<td>ECA</td>
<td>Europe and Central Asia Region of the World Bank</td>
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<tr>
<td>EMT</td>
<td>Environmental Management Plan</td>
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<tr>
<td>FAO</td>
<td>Food and Agriculture Organization of the United Nations</td>
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<tr>
<td>FAO/CP</td>
<td>Food and Agriculture Organization Cooperative Program</td>
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<tr>
<td>GETS</td>
<td>Gathering Evidence for a Transitional Strategy for HPAI H5N1 Vaccine in Vietnam</td>
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<tr>
<td>GFRP</td>
<td>Global Food Crisis Response Program</td>
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<tr>
<td>GIS</td>
<td>Geographic Information System</td>
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<tr>
<td>GPAI</td>
<td>Global Program for Avian Influenza Control and Human Pandemic Preparedness and Response</td>
</tr>
<tr>
<td>GPS</td>
<td>Global Positioning System</td>
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<tr>
<td>GRM</td>
<td>Grant Reporting and Monitoring</td>
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<tr>
<td>Green Book</td>
<td>Integrated National Operational Program Avian and Human Influenza 2006-2010</td>
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<tr>
<td>HALE</td>
<td>Health-Adjusted Life Expectancy</td>
</tr>
<tr>
<td>H1N1</td>
<td>Subtype of influenza A virus, also known as novel H1N1 flu virus (2009 pandemic)</td>
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<tr>
<td>H5N1</td>
<td>Influenza A virus subtype H5N1, also known as avian influenza</td>
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<tr>
<td>HDN</td>
<td>Human Development Network</td>
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<tr>
<td>HPAI</td>
<td>highly pathogenic avian influenza</td>
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<tr>
<td>IBRD</td>
<td>International Bank for Reconstruction and Development</td>
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<tr>
<td>IDA</td>
<td>International Development Association</td>
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<tr>
<td>IFPRI</td>
<td>International Food Policy Research Institute</td>
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<td>IHR</td>
<td>International Health Regulations</td>
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<td>ILRI</td>
<td>International Livestock Research Institute</td>
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<td>IMCAPI</td>
<td>International Ministerial Conference on Animal and Pandemic Influenza</td>
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<tr>
<td>INAPs</td>
<td>Integrated National Action Plans</td>
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<tr>
<td>ISO</td>
<td>International Organization for Standardization</td>
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<tr>
<td>ISR</td>
<td>Implementation Status and Results Report</td>
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<td>JSDF</td>
<td>Japan Social Development Fund</td>
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Preface

The International Ministerial Conference on Animal and Pandemic Influenza (IMCAPI), held in Hanoi in April 2010, was the seventh in a series of such meetings. All of these conferences represent international cooperation and coordination at the highest levels. They also represent a shared sense of purpose, in which a major threat to development, and human health and poverty reduction is anticipated in a very strategic way. We, within the World Bank, and in concert with our partners in the international development community, need to become better at doing this. Addressing the threat of emerging and re-emerging pandemics of zoonotic origin is an excellent place to start. The issue forces us to think outside of the “silos” in which we work, it demands coordination between sectors within our institutions as well as coordination among partner institutions.

One of the great practical imperatives that international cooperation in this area faces is essentially political. The sharp public awareness of a pandemic emergency very quickly loses its edge when the pandemic or disease with the real potential to become pandemic is effectively contained. Historically, this cycle of panic from being caught unprepared giving way to casual disregard has been costly.

The Hanoi meeting reaffirmed the resolution to maintain forward momentum and more consistent attention to zoonotic diseases. This is encouraging. The challenge of translating this resolve into practical steps now lies largely before us, and I encourage you to pursue this commitment not only among technical staff who specialize in human, animal and ecosystem health, but with development practitioners more broadly.

The stakes are very high.

Juergen Voegele
Executive Summary

At the 7th International Ministerial Conference on Animal and Pandemic Influenza (IMCAPI) in Hanoi in April 2010, ministers agreed on a framework for sustaining progress in the control of highly pathogenic avian influenza (HPAI), and for improving the capacity to respond to other diseases which may emerge at the animal-human-ecosystem interface (“One Health”). “Animal and Pandemic Diseases: A Framework for Sustaining Momentum” consists of three streams of work which require ongoing attention on the part of national, regional, and international institutions. The first stream is the prevention and control of HPAI in particular. The second is to make One Health approaches operational. The third is to ensure readiness to respond effectively to pandemics of zoonotic origin more generally. Within each stream the Framework defines expected outcomes and details the actions that can be undertaken to achieve them, including investment priorities, incentives to encourage a high and consistent level of performance, and mechanisms for monitoring progress. Particular emphasis is placed on support to institutions and systems in the least developed countries, where many of the global hotspots for potentially emerging zoonotic diseases are located.

Ministers emphasized sustaining forward momentum and ensuring continuity because of the practical reality that public interest in the issue inevitably wanes during the intervening periods between pandemics. As a result, political commitment to channeling resources to prevention and control tends to waver. The need for sustained commitment is now more widely recognized by policy makers than it has been in the past, and there is movement away from relying on reactive emergency measures or special, ad hoc initiatives which are intrinsically less effective and far more expensive than proactive strategies carried out within existing programs. Implementing such strategies cultivates capacity among responsible public agencies, and serves to “mainstream” the skills that preparedness requires as an important criterion for how the performance of those agencies is rated.

The World Bank Group and its international partners have a role to play in advancing, supporting, and helping to make the One Health agenda operational across countries. Defining that role was the subject of a learning exchange titled “Towards One Health: New Approaches to Managing Zoonotic Diseases” held in Ho Chi Ming City, Vietnam from April 14 to 17, 2010. The event was also used to exchange technical knowledge and ideas about good practices that had emerged from avian influenza-related operations, and to develop recommendations to inform future One Health activities.

The Global Disease Challenge: The Case of Highly Pathogenic Avian Influenza

Much has been accomplished in addressing H5N1, with notable progress in three areas. Firstly, significant capacity has been put in place. New facilities such as laboratory networks and hospital intensive care units, together with markedly improved communications, increased public awareness, and preparedness plans have made for better and timelier response to future pandemic threats in several countries. Secondly, partnerships and collaboration are occurring at the global, regional and
national levels, supported by international and national financing. Thirdly, a significant body of practical knowledge has been gleaned from operational experience and is now readily available to practitioners in the form of guidelines on biosecurity, compensation for culled animals, and training materials. These outcomes were based on 72 Global Program for Avian Influenza Control and Human Pandemic Preparedness and Response (GPAI) operations in 60 countries (Annex 11), which were implemented with a large family of partners.

A number of factors have contributed to the success of GPAI operations to date. Most affected countries have seen strong government leadership, coordination between sectors and disciplines, and effective use made of international technical and financial support. These have enabled them to move beyond emergency response and into long-term strategic planning, exemplified by national strategic plans such as the Green Book in Vietnam, the New Delhi Roadmap, and integrated national action plans (INAPs) in Africa. The GPAI investments in capacities have, in a number of countries facilitated timely notification of outbreaks, and improved channels of communication. Disease surveillance and control systems now employ a wider range of tools, including vaccination, culling, and transparent compensation programs.

A great deal has been achieved at the World Bank as well. The GPAI was the first global program to be implemented in all Regions of the Eastern hemisphere nearly simultaneously (Latin America and the Caribbean Region participated with a lag, because, fortunately, H5N1 outbreaks were not seen as imminent, in contrast to the situation in 2005-2006 in Africa, Asia, and Europe). It was prepared in record time, and the practical lessons learned in carrying it out have provided a model which has been adapted by other global programs, such as for the response to the food security crisis. The Operations Policy and Country Services (OPCS) unit was particularly effective in establishing internal and external coordination mechanisms. However, implementation at the country level was mixed for a number of reasons that will be described in this report (including waning political commitment, lack of interoperability between Bank’s procurement policies and UN agency requirements, and weaknesses in coordination during emergency responses).

Many countries managed highly successful projects. For example, Vietnam’s emergency response to avian influenza provides a model of resilience. The country’s Avian Influenza Emergency Recovery Project was the world’s first comprehensive HPAI emergency response operation. The Project was fully implemented in less than three years in the ten provinces worst-hit by the virus. It helped enhance national disease surveillance and diagnostic capacity, strengthened mechanisms in the poultry sector to contain serious outbreaks, and safeguarded public health by raising awareness of risks and disseminating knowledge about how to mitigate them. The Project provided a platform for action, enabling the government to articulate and lead a concerted response with donors, international technical agencies and civil society. Close attention was focused on ensuring that the response (for example, in designing, testing and monitoring a poultry vaccine) kept pace with the rapidly evolving threat, while the government crafted a longer-term strategy through investments to upgrade capacity, institutions and key health systems. Vietnam’s approach has informed the design of programs in more than 50 countries under the GPAI, and the Red and Green Books continue to
serve as a valuable reference resource on disease control and vaccination throughout East Asia and beyond.

*Influenza A Virus Subtype H5N1: Operational and Technical Good Practices and Challenges*

A review of the GPAI portfolio (2008) identified a number of constraints which had been encountered in designing and implementing elements of the GPAI and drew a series of lessons from project components. These lessons were used to develop recommendations for short-term and longer-term measures to achieve greater preparedness for outbreaks of diseases in animals and pandemics. Three practical lessons in particular emerged in the review.

- Political buy-in at the country level is critical.
- Project design must set appropriate objectives for medium-term needs in view of the short term nature of the emergency; it should carefully take into account the capacities of Bank counterparts and strive to simplify processes and procedures.
- Because emergency operations often need to be implemented in cooperation with inexperienced counterpart institutions that may lack clearly-defined roles or procedures, funding for preparation and implementation support must be adequate, especially in view of the urgency of the work and need for timely and effective implementation.

**Making One Health Operational**

Event participants and further work identified the following key steps for making the One Health approach operational among countries and international agencies.

**At the country level**

- Step 1: Identifying in-country champions
- Step 2: Making the case for early identification and control of zoonotic diseases
- Step 3: Assessing the needs of the services
- Step 4: Joint priority setting and preparedness planning, including the identification of hot spots
- Step 5: Establishing the appropriate enabling regulatory, institutional and financial environment.
- Step 6: Developing educational curricula, in particular at the university level, which integrate human, veterinary and ecosystems health
- Step 7: Establishing the appropriate financial instruments

**At the international agencies level**

- Creating increased awareness and making the case for One Health by preparing and disseminating economic analysis of disease impacts and enhancing advocacy mechanisms
- Improving collaboration among international technical agencies
- Identifying sustainable funding systems to support low income countries to cover the investment cost
- Strengthening research capacity
1. Setting the Scene

The majority of today’s emerging and re-emerging infectious diseases are considered zoonotic in origin – they are transmissible from animals to humans. By some estimates, 61 percent of known human pathogens are of animal origin. More than 800 different pathogens (for example viruses, bacteria, fungi, protozoa, parasites, and insects) can be transmitted from animals to humans. It is believed that 75 percent of all emerging infectious diseases among humans are zoonotic in origin (Cutler et al. 2010).

The factors that contribute to the emergence of disease can be classified into three host health domains: human living environments, food and agriculture systems, and natural ecosystems. The principal drivers of disease emergence include increased density and mobility of animal and human populations, decreased diversity of ecosystems, intensification of agriculture, trade, global warming and/or climate variability, and environmental degradation.

The consequences of infectious diseases can be catastrophic at the global level. H5N1, the virus that causes HPAI, has already cost over US$20 billion in economic losses. More than 1 billion head of poultry died or had to be culled to prevent the spread of the disease. If H5N1 explodes into a severe influenza pandemic, it could cost the global economy on the order of US$3 trillion (Burns et al. 2008). H5N1 HPAI remains entrenched in poultry in several countries, has the potential to spread to poultry in other countries, and could mutate to cause a pandemic of human influenza. To date, avian influenza infections of humans are extremely rare, and the number of human cases globally is less than 600 (Table 1). Pandemic H1N1 emerged in April 2009 and has since spread throughout the world. The final impact of the pandemic is not yet known, but the emergence of the virus provides a timely reminder of the need for ongoing investment in prevention and control.

Table 1: Cumulative Number of Confirmed Human Cases of Avian Influenza A/(H5N1) Reported to WHO (as of June 3, 2011)
H5N1 HPAI disproportionately affects the poor and especially poor women. Many are heavily dependent on income from poultry and often on the consumption of poultry products. Controlling outbreaks effectively, without negatively impacting poor and vulnerable communities, remains a challenge throughout much of the developing world. The distribution of its effects by income category is illustrated in Figure 1, showing that the poorest households suffer the largest proportionate losses in their incomes.

**Figure 1: Effect of a Ban on Poultry Keeping on Household Income of Different Wealth Groups in Vietnam**

![Figure 1](image.png)


The global community has invested heavily in the eradication and control of H5N1 HPAI and preparedness for a pandemic. By June 2010, the World Bank had committed almost US$1.3 billion from a variety of sources for projects to strengthen human and animal health services and communication activities in 66 countries to address H5N1, H1N1, and other zoonotic diseases. Much has been accomplished. Progress has been evident in four areas in particular. Firstly, significant capacity has been put in place. New facilities such as laboratory networks and hospital intensive care units, together with markedly improved communications, increased public awareness, and preparedness plans have made for better and timelier response to future pandemic threats in a number of countries. Secondly, partnerships and collaboration are occurring at the global, regional and national levels, supported by significant levels of mobilized international and national financing. Thirdly, a significant body of practical knowledge has been gleaned from operational experience and is now readily available to practitioners in such forms as guidelines on biosecurity compensation and training materials. Fourthly, the experience firmly points to the need for animal and health
authorities to keep one another informed, and when an outbreak does take place, to collaborate purposefully in characterizing and responding to the threat. This is one of the key lessons for adopting One Health approaches.

The prevention and control of avian influenza and other zoonotic diseases have received high-level international attention, most notably at a series of ministerial-level meetings held in Beijing and Bamako in 2006, New Delhi in 2007, Sharm el-Sheikh in 2008, and the IMCAPI in Hanoi in April 2010. Following the New Delhi meeting, the One Health approach was viewed as one of the most promising avenues to address future disease challenges. This was followed by a One Health consultation in Winnipeg in 2009.

This report is based in part on the presentations and discussions from the Learning Exchange Event, held in Ho Chi Minh City in April 2010. It also draws from a wider body of literature that documents the experience of the H5N1 HPAI campaign, and seeks to provide further insights into the implementation of One Health approaches. Its intended audience, in addition to the participants of the Hanoi meeting, includes policy makers and project design professionals interested in developing institutions and investments that will provide for greater preparedness for control of endemic and emerging zoonotic diseases, and for when the next pandemic occurs.

The Learning Exchange Event

The Learning Exchange, Towards One Health: New Approaches to Managing Zoonotic Diseases, was held in Ho Chi Minh City, Vietnam, from April 14 to 17, 2010. It was sponsored by the Agriculture and Rural Development Department and the Human Development Network at the World Bank, and hosted by the Ministry of Agriculture and Rural Development and Ministry of Health, Vietnam. More than 60 participants (Annex 3) included senior animal and human health practitioners from 12 countries (Albania, Armenia, Azerbaijan, Bosnia-Herzegovina, China, Laos, Mongolia, Myanmar, Niger, Nigeria, Turkey and Vietnam); World Bank staff; and representatives from the FAO, International Food Policy Research Institute (IFPRI), United Nations System Influenza Coordination (UNSIC), United Nations Development Program (UNDP), United Nations Children's Fund (UNICEF), and the World Health Organization (WHO).

The objectives of the learning exchange were to: (i) exchange experience on technical and operational good practices and lessons learned from the international and country-level responses to H5N1; (ii) consider the appropriate role for the World Bank in supporting the adoption of One Health; and (iii) develop operational and technical recommendations to inform future One Health activities. The concept note for the event is presented in Annex 1 and the agenda in Annex 2.

The event started with a two-day workshop in Ho Chi Minh City with technical clinics which focused the following topics:

- Controlling H5N1 at Source: The Red Book, the Green Book and Future Approaches to Integrated Disease Management in Vietnam
Eighteen presentations were made, all of which are accessible at http://onehealthvietnamevent. Each clinic was followed by a plenary discussion.

During field visits to Can Tho and Long An provinces on days three and four, the participants visited a laboratory in Can Tho, a small holder farm in Long An (Annex 9), a slaughter house, a hospital, and participated in an H5N1 simulation exercise.

The outcomes of the workshop were presented to the 7th International Ministerial Conference on Animal and Pandemic Influenza: The Way Forward from April 19 to 22, 2010, in Hanoi (Annex 4).
2. The Global Disease Challenge: Practical Lessons from the Case of Highly Pathogenic Avian Influenza

This section presents a summary of factors contributing to successful H5N1 operations based on country experiences and lessons learned that should be taken into consideration in shaping the One Health agenda.

National and Regional Experiences

Vietnam was the first country in the East Asia and Pacific Region to develop and implement a World Bank-funded avian influenza control project. On December 24, 2003, the province of Long An in the south of Vietnam reported large, unusual die-offs in chickens. A few days later, similar reports were received from neighboring provinces by the Department of Animal Health in Hanoi. On January 8, 2004, the Government officially declared that HPAI virus type A H5N1 had entered the country.

At the request of the Government of Vietnam, the World Bank in collaboration with FAO organized a project preparation mission, which began its work on March 3, 2004, to prepare what would become the Bank’s Vietnam Avian Influenza Emergency Recovery Project (Vietnam 1). This was well over a year before GPAI came into being (Annex 5). The two-year emergency operation was appraised 6 weeks later, became effective on November 4, 2004, and was completed in June 2007, to be followed by a second, broader-scoped standard operation, the Vietnam Avian and Human Influenza Control and Preparedness Project (VAHIP, Vietnam 2) with an estimated cost of US$35 million.

Both projects were prepared in accordance with rapid response policies and procedures. The project substantively contributed to the GPAI framework that has guided all Bank-supported avian and human influenza operations. Furthermore, the Bank assisted the Government in preparing its Integrated National Plan presented at the International Pledging Conference for Avian and Human Influenza in Beijing in January 2006. This Integrated National Plan remains a model for other countries addressing the threat of avian influenza.

Vietnam 1 focused entirely on animal health, even though a number of human cases and deaths had been recorded in 2003. A compensation fund was established, affected stakeholders were compensated for culling losses, and a pro-poor restocking program was launched, in which low income households that had lost their poultry were restocked and trained in the biosecure raising of backyard poultry. Assisted by donors and UN agencies, the Government prepared both short-term (Red Book) and long-term (Green Book) policies and programs for the control of avian influenza (Annex 6). The poultry sector is being restructured under VAHIP. A nationwide vaccination program, and risk reduction strategies in poultry production (good animal husbandry practices, improved farm biosecurity) and marketing (live birds banned in major cities, development of
market/processing infrastructure) have been factors in reducing outbreaks. All these interventions were first-time undertakings, and there were few examples from which to draw. Most importantly, the Government has shown a sustained commitment to overcoming the crisis, generating equally sustained support by the donor community. As a result of these interventions, Vietnam has become an example of how a developing country can successfully counter the avian influenza crisis, and many of the lessons learned have been adopted in other GPAI and donor-funded projects.

The Ministry of Agriculture and Rural Development (MARD) was the sole implementing agency, working with the National Steering Committee. Public awareness work, implemented by the extension service of MARD, received external support from UNICEF and other donors. The Vietnam Women’s Union (VWU), the national, quasi-governmental women’s organization, helped implement the smallholder poultry restocking program. This arrangement became a win-win situation and deserves a good practice mention.

At their peak in 2004-2005, outbreaks of H5N1 in poultry spread widely across Vietnam. To reduce the impact of the disease, the Government of Vietnam took immediate actions, under its national HPAI control policy, to implement surveillance, detection, response, compensation, and vaccination strategies. The Government made significant investments in training and enhancing the capacity of animal-health staff across the country, helping them to conduct active surveillance and investigations. It also created joint surveillance and rapid response teams to decrease the time that elapsed between disease detection and response. Community engagement in H5N1 HPAI detection and reporting was encouraged through education campaigns, which resulted in increased awareness and broader surveillance. The education campaigns explained how to detect and report suspected cases of H5N1 HPAI using telephone hotlines. The Government and its partners invested in laboratory networks within Vietnam to detect H5N1 HPAI viruses. Thanks to these investments and coordination, along with strong inter-sectoral cooperation among Government ministries, stakeholders including poultry farmers and others engaged in poultry trade, NGOs, and international organizations, Vietnam is better prepared to manage H5N1.

Commune Level

The Vietnam 1 project was able to engage with representatives of civil society, including the international non-governmental organization Agronomes et Vétérinaires sans Frontières (AVSF) and mass organizations (including the VWU), to establish community-based epidemiological surveillance networks which are key in creating a sustainable approach to animal disease identification and control. The VWU organized training and smallholder poultry groups. This was the key initiative within the project’s public awareness and information campaigns sub-component.

Vaccination

Poultry vaccination is a valuable component of the disease control program in Vietnam. It has become clear that use of properly formulated vaccines can play a valuable role in HPAI control, particularly if infection has already become widespread in a country. For example, the number of outbreaks in domestic poultry and human illness and death decreased substantially in Vietnam.
following the use of vaccination in association with culling of infected and in-contact birds, controlling duck farming, controlling markets and the implementation of on-farm biosecurity measures. However, extensive resources are needed to mount vaccination programs effectively, including surveillance and development of an exit strategy. Vaccination issues are covered in detail in Chapter 4.

**Industrialization of Poultry versus Smallholders**

The Vietnam 1 project showed that, (a) improving the biosecurity of backyard poultry keeping is feasible and can contribute to countering endemic disease and production losses, and (b) shifting from free-ranging to confined poultry keeping will improve poultry performance, reduce mortality, and increase profits. The overriding factor in achieving this shift is that there must be a clear financial incentive for households to want to shift from free-ranging, low-input backyard poultry-keeping to confined, more costly, more labor-intensive poultry production. The biosecurity measures must therefore be sound, so that stakeholders will have the confidence to adopt the new system. Poor and low-income households who cannot afford the cost of introducing effective biosecurity may fall by the wayside without financial assistance.

Vietnamese participants shared the following lessons learned from H5N1 control.

- Vaccination has successfully reduced incidence but is only one of the necessary control measures
- Risk reduction is required throughout the production and marketing chain, and this is a medium term development goal
- Biosecurity improvements require understanding, motivation and investment
- Disease control requires reliable diagnostic laboratories with high capability and capacity
- Compensation must be paid promptly at the appropriate level to promote early disease detection and protect livelihoods
- Transparency and timeliness of information reporting are critical to ensure accurate analysis of the disease situation
- Control measures must be assessed for impact and cost effectiveness
- Motivating change in backyard and small commercial farms is key to success

**Challenges.**

- Maintaining commitment nationally and internationally
- Addressing producer perception of low risk—and “selling” the benefits of better poultry health and productivity
- Balancing protection of rural livelihoods and smaller producers with development of large-scale biosecure poultry production
- Supporting grazing ducks as a viable production system by ensuring effective vaccination and risk reduction
• Using risk assessment to direct finite resources most effectively and to better target costly vaccination/control measures
• Enacting already drafted veterinary legislation
• Improving veterinary education and specialist skills
• Implementing an integrated human, animal and ecosystem health program

Lessons Learned from the Vietnam Avian and Human Influenza Control and Preparedness Project (VAHIP, Vietnam 2)

Many problems in the control of H5N1 were associated with more general performance constraints of the human health system that limit the capacity to deliver the required technical responses in many areas (Box 1).

Box 1: Human Health Sector Systemic Constraints in Vietnam

In its previous reaction to the HPAI outbreak, the Ministry of Health mobilized government and donor resources for investments in the HPAI response. These were primarily used for equipment (ventilators, refrigerators, disinfectant sprayers, personal protective equipment, etc.), revision of clinical care guidelines and training for curative care staff in influenza patient care and for preventive medicine staff in an early warning and response system. These were backed up by outbreak simulation exercises in seven areas. In the course of its implementation, it was observed that most of the challenges faced were not specific to HPAI, but were the result of more general constraints of the system, such as:

• Human resource shortfalls - low numbers, poor staff motivation, inadequate technical skills in both preventive medicine and curative care;
• Infrastructure and equipment inadequacies in hospitals and preventive medicine; and
• Poor quality data from surveillance because of inadequate forms and weak data collection, flows, and use.

These areas have been addressed in various sub-components under VAHIP, Vietnam 2.

Source: VAHIP Technical Annex (2007/02/15)

VAHIP represents a shift from emergency response to supporting medium- to long-term integrated disease control and prevention programs for both the poultry industry and human populations. The VAHIP is being implemented by the Ministry of Agriculture and Rural Development and the Ministry of Health. Key outcomes are enhanced Government ownership and strengthening of coordination mechanisms and collaborative working arrangements between the human and animal health sectors, which are critical to the success of an integrated avian influenza control and prevention program in the long term.

VAHIP emphasizes biosecurity, poultry sector restructuring and live bird market upgrading in an effort to break the infection chain from producer to consumer. The project's development objective is to increase the effectiveness of Government services in reducing the health risk to poultry and humans from avian influenza in eleven high priority provinces and thus contribute to addressing
HPAI at the national level by controlling the disease at source in domestic poultry, by early detection and response to poultry and human cases, and by preparing for the medical consequences of a human pandemic. A parallel project, Livestock Competitiveness and Food Safety, addresses also poultry sector restructuring in addition to livestock processing and food safety.

Success factors include:

- Strong commitment of Government and mobilization of political system involvement
- Health system strengthening including preventive medicine system from central to local level
- Cooperation between human health, animal health, and other sectors
- Sharing information with local and international organizations/agencies to mobilize further assistance on technical and financial issues

Vietnam’s emergency response to avian influenza helped enhance national disease surveillance and diagnostic capacity, strengthened mechanisms in the poultry sector to contain serious outbreaks, and safeguarded public health by raising awareness of risks and how to mitigate them. The project provided a platform for action, allowing the government to articulate and lead a concerted response with donors, international technical agencies and civil society. Close attention was focused on ensuring that the response (for example, in designing, testing and monitoring a poultry vaccine) kept pace with the rapidly evolving threat, while enabling the government to craft a longer-term strategy through investments to upgrade capacity, institutions and key health systems. Vietnam’s approach has informed the design of programs underway in more than 50 countries under the GPAI.

Regional Experiences

In early 2006, the Africa Region’s Vice President (AFRVP) Office created the Africa Region Avian and Human Influenza Task Force (AFR AHI), with members from both the Sustainable Development and the Human Development Networks. This cross-sectoral task force designed a program with three specific objectives: (i) to strengthen the veterinary services of Sub-Saharan African (SSA) countries, particularly in mounting emergency and medium-term responses to avian influenza outbreaks; (ii) to improve the capacities of SSA health systems to respond to a potential pandemic; and (iii) to support country efforts in developing coordinated national responses to avian and human influenza. The Regional program helped African countries organize an effective response to contain outbreaks and prevent disease spread beyond their borders.

The Africa Region's response to the avian influenza threat has been impressive, thanks to the rapid mobilization of the AFR AHI Task Force in 2006 and parallel financial and technical support from Africa Livestock (ALive) partnership (Annex 7). These activities have led to ongoing AHI projects in several countries and have improved the Bank staff’s technical and operational skills to respond to an avian influenza emergency. ALive continues its prevention and preparedness program (Rapid Assessments (RAs) and INAPs), and the situation is for the time being stable, with no recent reports of large-scale outbreaks. However, this may change rapidly, as the threat of emerging and re-emerging (including zoonotic) diseases remains. If new outbreaks occur, the Bank should quickly
shift from pre-operational activities, i.e., ALive’s RAs and INAPs, to emergency operations. In this instance, support from World Bank senior management would be critical in securing additional IDA allocation and grants from trust funds, including the Avian and Human Influenza Facility (AHIF). AHIF would however need to be financed by new donor contributions since AHIF funds for Sub-Saharan Africa, which were always extremely limited, have now been depleted.

Niger’s ongoing AHI project is ending, but needs persists for new programs to control zoonotic diseases, recognition of the control of potential pandemic diseases as a global public good, coordination of trans-boundary diseases at the national (e.g. via interministerial or technical committee), regional and sub-regional levels, and building capacity at the Regional Economic Commission level.

The Nigeria Avian Influenza Control and Human Pandemic Preparedness and Response Project was prepared by the government in 2006 in one month and set the World Bank Africa Region’s speed record for project preparation. This project incorporates three components: Animal Health, Human Health and Social Mobilization. Although the communications component has thus far been under-funded, an effective communications network has been put into place to alleviate this concern. After the record preparation time for this project, however, implementation and disbursement have been slow during the first two years of implementation. In an effort to rectify this situation, compensation for culled poultry is being provided by the emergency fund of Nigeria. The coordination mechanism that was set up for Nigeria’s response to HPAI is being strengthened, expanded and institutionalized to deal with emerging and re-emerging zoonotic diseases (including existing endemic diseases) at the national, regional and sub-regional levels.

The **Europe and Central Asia (ECA) Region** has supported a large and comprehensive regional avian influenza portfolio. A series of video-conference seminars on technical issues related to avian influenza control have been conducted around this portfolio, and a Central Asia Regional Public Health Platform initiated. Regional coordination is important, especially in the area of surveillance, where the World Bank could play a facilitating role. A One Health team has been established. Within the ECA Region the following individual country experiences were highlighted in several presentations and in subsequent discussions:

Armenia has been noted for the effective public awareness and implementation support components within its AHI project, which provides information and communication activities in order to increase awareness and increase commitments by the Government, private sector and civil society organizations. One aim has been to strengthen the understanding of the risk and impact of a potential pandemic among the general population.

Azerbaijan completed an AHI project and is now aiming to develop strategies for future action, based on what works and what does not work in this sphere. Azerbaijan has supported the institutionalization of mechanisms that have been established to control HPAI and recommends that these mechanisms be extended to other diseases. Whereas adequate coordination has helped avoid the duplication of efforts, it has also caused delays in the execution of certain project activities.
Bosnia and Herzegovina/Republic of Srpska opted for a multifaceted approach guided by the Ministry of Health and includes representatives from the Ministry of Agriculture. Communication stands as the foundation for the successful management of pandemic impacts, notably by raising awareness without giving rise to panics. Communication is crucial to mitigate the impact of a pandemic (e.g., through prevention of infections of individuals) and is also crucial to gain public cooperation with other actions to mitigate pandemic impacts. Furthermore, a Polymerase Chain Reaction (PCR)-established network for preparation and transportation of samples is in place (so as to support timely diagnosis). Further, hospital cases were under oseltamivir treatment, and important links to the community were established.

Kosovo and Albania are currently focusing on public awareness campaigns, based on experiences from Vietnam. These campaigns, which aim at HPAI/One Health issues, are being included in school curricula. There is a flexible inter-ministerial coordination initiative in place for ensuring sustainability.

Turkey’s Avian Influenza and Human Pandemic Preparedness and Response project is characterized by effective, multifaceted project implementation, which has been done in close collaboration with donors (especially the EC, WHO, FAO and the World Bank) and has resulted in the control of the infection. Ideally, this inter-ministerial collaboration should be sustained after the project’s closure. Costs of operation of the eight mobile information kiosks, which are currently serving all regions, are being covered by the Turkish Government to ensure sustainability. Turkish participants noted several key points, including a need for global/regional prioritization of the main diseases for a One Health discussion, the fact that the One Health concept does not resonate with Ministries of Finance, the need for establishing public health/zoonotic departments (or similar bodies) in order to collaborate with respective ministries, the possibility of using a common database for zoonotic diseases (and assigning responsibility for providing data into it), the potential mapping of responsible public agency/partners, and the prospects of working together on joint projects for health and agriculture through accessing common global funds.

In the South and East Asia Regions (SAR/EAP), India’s Integrated Disease Surveillance Project aims at improving information that is available to the Government health services, as well as private health care providers, regarding a set of high-priority diseases and risk factors. The overall objective of the Project is to improve grassroots responses to such diseases and accompanying risk factors. The project has four components: 1) establish and operate a central-level disease surveillance unit, under the Ministry of Health and Family Welfare to help coordinate and decentralize disease surveillance activities, thus complementing the state’s disease surveillance efforts; 2) integrate and strengthen disease surveillance at the state and district levels, addressing coordination constraints at the sub-national levels, the limited use of modern technology and data management techniques and the need to include stakeholder participation, including involvement by the community and the private sector; 3) improve laboratory support by upgrading laboratories at the state level and improving laboratory surveillance activities. Support includes diagnosis, monitoring drug resistance and changes in disease agents. Additionally, a quality assurance system for assessing and improving
the quality of laboratory data will be introduced; and; 4) provide training for disease surveillance and action in an effort to support changes envisioned under the first three components, initiate a coordinated training effort to reorient health staff towards an integrated surveillance system and provide necessary new skills.

There has been notable collaboration between the Lao PDR Government, external donors, technical partners and the Bank team which is resulting in better alignment of activities aimed at avian and human influenza control and preparedness. The project is being implemented in close collaboration with the donor community and with UN partners. UNICEF has already launched several effective public awareness campaigns.

Mongolia has established a technical committee to work across three ministries (MoA, MoH, National Emergency Management Agency) on disease control at the national and local levels. The challenges remain, however, how to continue this collaboration after the end of the project and how to expand the scope to incorporate other diseases as well.

A presentation by the participants from Mongolia underscored the need for clarification of the role of migrating wild birds. Migrating wild birds are capable of flying long distances after exposure to HPAI and are likely to carry the virus over large distances. Unfortunately, the exact species which may be involved is currently unknown. The role of migrating birds in starting infection in domestic poultry also remains unclear, but is certainly less of a factor in the international spread of infection to poultry than the legal and - in particular - informal trade of poultry and poultry products. Also, the participants underscored the need for improvement of the knowledge base for wild birds and dissemination.

Myanmar is making good progress towards understanding more about HPAI risks factors (border, wild birds, ducks) and has developed strong laboratory capacity while simultaneously building its epidemiology capacity.

Institutional arrangements

In many countries, existing multiagency steering committees established to oversee emergencies have been entrusted to provide general policies and guidelines for avian influenza control, and to oversee project implementation. These committees comprise high-level government officials from the ministries of health and agriculture as well as other relevant government agencies. Recognizing the importance of the issue, most committees are reporting to high-level officials such as the prime minister or deputy prime minister. Similarly, existing coordination structures have been entrusted with the coordination of implementation activities under avian influenza projects, including procurement and financial management, as is provided under the GPAI framework. Existing structures have been strengthened by local consultants to deal with procurement and financial management, overall administration, technical assistance, and training coordination. With the exception of two countries discussed during the event—Armenia and Turkey, which opted for separate coordination units for agriculture and health—the tasks of coordination and fiduciary
oversight have been assigned to a single unit. Both types of arrangement appear to be working well at present.

Rapid Assessments of Public Health and Veterinary Services

As the Bank had practically withdrawn for the livestock sector, and there was limited knowledge of the needs of the public health and veterinary services, Rapid Assessments were carried out to help define the requirements of client countries for GPAI support. In the Africa Region the rapid assessment missions were carried out under the ALive Partnership, and involved close cooperation between the World Bank, FAO, OIE, WHO-AFRO, and AU-IBAR – an excellent example of cooperation between global and regional organizations. These had two principal objectives. The first was to evaluate the strengths and weaknesses of veterinary and medical services. The second was to develop national avian influenza control and pandemic preparedness plans. The process of formulating those plans often provided line ministries with their first opportunity to work with World Bank missions, and to liaise with national steering committees or their equivalents. The institutional arrangements set up during this process have been instrumental in promoting the subsequent collaboration between line ministries, and between ministries and Bank missions or donors.

A number of practical lessons emerged from the rapid assessment exercises, but two of them were particularly prominent. The first relates to inter-ministerial collaboration, and more specifically to the expectation that ministries will meet and work together effectively. Establishing this expectation up-front and making it a shared priority makes it much more likely that such collaboration will take place. The second lesson is to use the results of the rapid assessment and later the PVS in designing both the content and the results framework of the AHI project. Where this was not done, and where it was done improperly, it usually resulted in poorly designed work plans and M&E arrangements.

Perspectives from International Organizations

Participants have noted that coordination at the institutional, sectoral and interdisciplinary levels is complex. Effectively managing HPAI has given countries more confidence in their efforts to manage zoonotic diseases. Most countries have preparedness plans and other instruments for controlling diseases, but these do not always work effectively. Hence, country champions should play a proactive role in promoting and facilitating the One Health approach. Indeed, countries should be in the driver seat for One Health, including the preparation of one strategic plan at the national level, one implementation plan, and one monitoring and evaluation plan. Partnerships are crucial for the success of One Health agenda. Concerted efforts need to focus on the effectiveness of existing partnerships rather than on the prospects of creating new ones.

The World Bank has accumulated a substantial body of practical experience in implementing emergency recovery projects. Since 1985, the Bank has financed well over 500 projects in response to natural disasters. As disease outbreaks, if not contained, can also become natural disasters, the Bank’s support for the AHI response is consistent with its past engagement. What is notable, however, is the strong emphasis on preparedness and prevention in the AHI portfolio. In all, there have been more than 70 AHI projects in 60 countries (including both new and restructured existing projects) supported by the Bank since 2005. While these are having a significant impact on strengthening national veterinary and human medical services in controlling or preventing avian influenza and other diseases, a number of AHI projects have encountered problems both in their design and implementation. In 2008, an AHI portfolio review was carried out to assess the performance of the projects and to draw lessons. Although the findings were not specifically discussed at the Learning Exchange, they provide a reference for recommendations to increase preparedness for outbreaks in animals as well as for pandemics in both the short and long terms.

The Portfolio

The portfolio review included a total of 56 stand-alone animal and human health projects which together accounted for a total of US$957 million. Table 2 shows the Regional distribution of the portfolio.

Table 2: Regional Distribution of the Avian and Human Influenza Portfolio (as of April 2010)

<table>
<thead>
<tr>
<th>Component within a larger project</th>
<th>Stand-alone project</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IDA/IBRD financing</td>
<td>Trust fund financing</td>
</tr>
<tr>
<td>Number of Projects</td>
<td>$ million</td>
<td>Number of Projects</td>
</tr>
<tr>
<td>AFR</td>
<td>3</td>
<td>65</td>
</tr>
<tr>
<td>EAP</td>
<td>4</td>
<td>36</td>
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<tr>
<td>ECA</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>LAC</td>
<td>7</td>
<td>62</td>
</tr>
<tr>
<td>MNA</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>SAR</td>
<td>3</td>
<td>40</td>
</tr>
<tr>
<td>TOTAL</td>
<td>14</td>
<td>115</td>
</tr>
</tbody>
</table>

* Special financing

Preparation and Appraisal

The preparation of the GPAI, an umbrella program for the funding of HPAI (a so-called horizontal Adjustable Program Loan) was fast and efficient. Only three months elapsed between the initial review of the concept note and the Board’s endorsement of a $500 million envelope for the global framework and of the first project, for Nigeria. (In response to the H1N1 pandemic, in June 2009
the Board increased the envelope by $500 million, to $1 billion.) In the spring of 2006, a number of AHI projects were approved soon after GPAI was endorsed. The Board approved the GPAI framework and, under the Adaptable Program Loan (APL) procedure, delegated approval of individual country operations to Management (Regional Vice Presidents). The AHI global program has served as a model for the food crisis response and may help inform other multi-country programs addressing global or regional issues.

Preparation of some of the individual country projects took time. The 39 AHI projects financed by IBRD/IDA and the two largest trust fund-financed projects averaged 272 days to prepare from the project concept document to Bank approval, and a further 188 days from approval to project effectiveness. This amounts to a combined average time span of 460 days. AHI projects financed by IBRD/IDA averaged 286 days from PCD to approval. Disaster response projects average 169 days from PCD to approval, but this comparison is misleading since in most countries with AHI operations, there were no or few outbreaks in poultry, and in no country did the government declare a state of emergency. Under these conditions, slower preparation and implementation of technically complex programs is inevitable, and cannot be compared to, e.g., removing rubble and quickly rebuilding housing following a major earthquake. Notably, many of the activities were for prevention, which too often is not carried out at all. The average elapsed time from PCD to approval for all projects (emergency and non-emergency) in ARD is 414 days, indicating that the GPAI framework and sense of urgency (if not emergency) in borrowing countries did stimulate relatively rapid processing.

In terms of the timeliness of the interventions themselves, Bank support did not arrive in time to provide immediate crisis assistance, nor was it intended to. An analysis of 11 infected countries showed an average elapsed time span of 346 days, or a period of 11 months, between the official declaration of the disease by OIE and the effectiveness. Such elapsed times are far too long when dealing with an aggressive, rapidly spreading epidemic. If no other assistance was available (and it was) such delays would greatly increase the size of the losses and the cost of subsequent control measures. The first emergency operation in Vietnam was a notable exception, taking only four months from concept to effectiveness.

Key factors for the long elapsed times included:

- Lack of resources was major factor affecting project preparation time. In particular, project preparation budgets were low. The average preparation costs for the IDA/IBRD funded HPAI investments amounted to about US$164,000 per operation, less than half the US$356,000 of normal IDA/IBRD project preparation costs of the ARD portfolio. The trust fund-financed operations took on average US$50,000 to prepare. While this low allocation might have been partly induced by the emergency nature of the operation, which was processed according to a standard template and required a less detailed assessment of fiduciary and safeguard requirements, it is still extremely low, particularly in view of the almost complete absence of experienced counterpart staff. On top of this, AHI projects were often added to an already heavy workload of the Bank Task Team Leaders.
• Insufficient expertise, as there was scarcity of technically skilled veterinarians and public health experts in the global pool. At the time of the outbreak, the World Bank had only three livestock specialists.

Implementation

Delay in effectiveness and disbursement were the main issues affecting AHI project implementation. Of the 30 projects with Implementation Status Reports (ISR) (28 IDA/IBRD and 2 large recipient executed projects), nine were flagged for delayed effectiveness. Slow disbursement became the main issue in this respect–17 projects in the same cohort were flagged for slow disbursement relative to the standard profile for emergency projects. However, this comparison must be nuanced. As noted above, there was an urgent need to increase preparedness for outbreaks and prepare for a pandemic – but in no country was an actual emergency declared. This is in stark contrast to the rest of the emergency portfolio, which addresses the aftermath of disasters, and only tangentially their prevention. Indeed, as Figure 2 below shows, AHI projects have disbursed more rapidly than specific investment loans, which they most resemble in terms of the activities financed (training, technical assistance, building laboratory capacity, procurement of equipment and supplies, etc).

Figure 2: Disbursement Performance of AHI Projects

![Disbursement Performance Graph]

Procurement, monitoring and evaluation, management, and implementation progress were flagged as problem areas in about a quarter of the projects. The following five areas deserve attention in future disease control and prevention operations:

i. Procedural issues. Well-defined procurement rules in particular are important. Without these, and where no fast-track procurement arrangements were in place to accelerate the
implementation of emergency interventions, procurement was often assigned to central agencies or other project management units that failed to account for the emergency nature of the operation. Governments’ procurement of technical assistance from WHO or FAO was delayed because of different, sometimes incompatible, administrative procedures between those agencies and the rules that apply to World Bank financing.

ii. **Resources for implementation support.** There were limited resources for supervision, with an average expenditure over the FY05-09 period of just US$70,000 per year per project ($77,000 for IDA/IBRD stand-alone and $32,000 for recipient executed projects). By contrast, all emergency operations received an average of $86,000 for supervision activities; ARD projects received $96,000 on average for supervision. The difference between ARD projects and AHI projects is surprising, since the AHI projects as emergency operations have a shorter implementation period (three years). Moreover, they are multisectoral and therefore require a broader skill mix, at a higher cost, than single-sector projects.

iii. **Overly ambitious objectives,** as projects, in spite of their emergency and therefore short duration nature, included long term objectives in institution building (both in physical infrastructure, such as buildings, and in human capacity) in their investment plans. Responding to an emergency while contributing also to long-term development objectives seems desirable, but not compatible with speed of delivery. Restricting the project objectives to the specific short term needs (with inputs such as vaccines, protective clothing, destruction of diseased animals, etc.), would avoid this conflict. The introduction of compensation funds for the destruction of diseased or suspected animals took needed to await the establishment of the regulatory framework; this often took time so that the funds only became operational only at the end of the project in some cases.

iv. **Institutional constraints at the country level,** in particular concerning problematic inter-agency cooperation, combined with "flu fatigue" and higher priority given to other diseases or other emergencies in the client countries, slowed implementation. Several client countries argued, with some justification, that the control of these potential pandemics is a global public good, and were therefore reluctant to borrow funds for their prevention and control. Endemic zoonotic diseases” (rabies, bovine tuberculosis, brucellosis, etc.) and food safety have often a higher priority for developing countries.

v. **Lending Instruments.** The horizontal Adaptable Program Loan (APL) instrument was selected for the GPAI. Under this format, Board approval is only required for the overall framework and the first two country investments. Subsequent country investments can be approved by Management, thus cutting processing time. APLs can bring higher visibility and attention through a large global program, in some cases generating demand in the countries for otherwise difficult agendas, and stronger identity under an umbrella program creating synergy and learning across individual country operations.
Operational Lessons Learned

Some key lessons which emerged from this review:

i. Political buy-in at the country level is critical;

ii. Current World Bank procedures seem highly appropriate as global convener and establisher of umbrella emergency frameworks, but seriously hamper the implementation of such frameworks at the country level, where Bank and local procurement and other fiduciary arrangements did not adequately take account of the emergency nature of such operations (in particular procurement policies did not enable speedy contracting of UN agencies for technical assistance and other support);

iii. Emergency project operations should set objectives which can be fully achieved in the short (normally three years) project duration, and not seek to tackle long term structural constraints; and

iv. The emergency nature of the investments should not imply that less funding for preparation and supervision is provided, as emergency operations often work with inexperienced counterpart institutions, and less clearly defined procedures.

The Way Forward

Recommendations on the way forward included short and long term measures. In the short term, the restructuring of some operations in the portfolio was recommended, along these lines:

a. Ensuring, to the degree possible, the sustainability of those longer term investments included in the respective project designs, with particular attention to the compensation funds;

b. Where the political will exists, reformulating the project objective to broader objectives of zoonotic diseases control and to cover a longer time span, as already being done in the ECA Region;

c. Re-negotiating a greater flexibility of the EU contribution to the AHIF, so that, if so requested, the several African countries could receive support;

d. Eventual allocation of AHIF resources to training in epidemiology, as already started in South Asia;

e. Closing non-performing projects which obviously lack a political commitment.

In the longer term, initiate a broader discussion on how the World Bank procedures at the operational level could better support global programs:

a. The Bank’s overall role, i.e. global convener and provider of financing, and its comparative advantages;

b. The establishment of a permanent One Health team at the World Bank, to oversee the activities related to zoonotic disease prevention and control;
c. Integration of pandemic preparedness within disaster preparedness at the World Bank, considering that it is multisectoral and primarily concerns ministries responsible to areas of major impact such as finance, interior, industry, transport, defense, commerce etc (as well as agriculture and health).

d. Although some progress has already been made, the clarification, in particular at the operational level, of the contractual arrangements between borrowers and the partner technical organizations (WHO, FAO and OIE); and

e. The preparation and establishment of a second generation of One Health projects, which would cover prevention and control of diseases at the interface between humans, animals and the environment, including all zoonotic diseases. Many countries may want to address food safety and bio-security as well.

\textit{Future lending instruments.} The advantages and disadvantages of the horizontal APL need to be assessed. This assessment could address the following questions: 1) is it useful for the design of individual country programs to have a global template; 2) is the Program Development Objective (PDO) of the APL a constraint; 3) what are the pros and cons of not having a Board discussion of each project and thus a lower profile, although a faster processing; 4) is there sufficient clarity on processing within the Bank; and 5) what are other internal and external considerations regarding, for example, procurement rules, supervision requirements in view of the multiple sectors involved, other fiduciary measures and, in particular, compensation?
4. Select Lessons from Implementation Experience of GPAI Projects

This chapter provides a review of the implementation experience of the three GPAI project components, Animal Health, Human Health, and Communications. It also draws from a number of presentations that were made at the Learning Exchange.

The Animal Health Component

The animal health components are generally well-implemented, particularly where the ministry or agency responsible for first response clearly understands the tasks at hand and the objectives those tasks serve. This mission clarity is often the result of having involved the agency in preparation and planning. Animal health generally consists of four primary subcomponents: laboratory services, disease surveillance, strengthening regulatory frameworks, and applied research. When a disease outbreak occurs, then containment may become an additional subcomponent, and may consist of vaccination (if permitted), culling, and compensation. Support from projects in the GPAI has been particularly effective in improving diagnostic laboratory services, and the human and physical resources those services rely on. Several of the more important implementation aspects of this component are covered in detail.

Diagnostic Laboratories and Biosafety

One of the most critical issues in strengthening laboratory services is the biosafety of veterinary and medical diagnostic laboratories. Human biosafety is a safeguard issue that must be disclosed in the Environmental Management Plan (EMP), and Bank-financed projects cannot allow laboratory worker health to be jeopardized by exposure to live avian influenza viruses and other infectious or hazardous agents in unsafe working areas. Many AHI project diagnostic laboratories have been upgraded to include biosafety 2 (BSL-2) units, and a BSL-3 level laboratory have been constructed in Vietnam. A significant sustainability risk exists, in that gearing up laboratory services to higher technical levels also increases their recurring operating costs. Such increased costs, used to purchase laboratory consumables and increased staff, which are already poorly covered by government budgets, will only prevent the use of new equipment and frustrate laboratory staff. Concurrent with laboratory upgrading, cost recovery mechanisms should be considered to help to defray such expenses by means of introducing user-pays schemes for client who can afford to pay.

Disease Surveillance

Effective veterinary disease surveillance is the most crucial first-responder tool in the fight against avian influenza, but also the weakest element in effective disease control. Many client countries do not have the functional veterinary epidemiology and risk assessment capacity to develop science-based disease control strategies to support their decision makers. The AHI project portfolio has identified a universally great need in developing countries to introduce sound, science-based epidemiological principles. In emergency situations such skills cannot be taught overnight. The AHI
program is addressing this constraint in a number of countries with training courses and the introduction of Global Positioning System (GPS) and geo-positioning technology to map and analyze disease outbreaks. With the shift to a longer AHI project lifespan, there is an opportunity to send selected candidates for a two-year MSc programs in epidemiology, or to take three to four month hands-on short courses. There is an urgent need for sustained action to upgrade surveillance capacity. This is especially important if the disease control paradigm is to shift from control to prevention, which requires the early and accurate detection of disease.

Community Health

The community health approach is one avenue for consideration and introduction of the One Health approach at the local level. Coordinating surveillance services at the local level may go far in preventing the kinds of delays that were experienced in diagnosing the HPAI as a result of the disconnect between public health and veterinary surveillance systems in some countries. For example, as indicated in the Pro-Poor HPAI Risk Reduction Strategies in Nigeria IFPRI Background Paper, community (grassroots) participation in active disease surveillance in various poultry production and marketing systems is already happening in Nigeria. Although structures exist for responding to a HPAI emergency mainly at the federal and state levels, these structures are non-existent in the rural areas where a majority of the country’s poultry is located. The Government of Nigeria, through the Federal Ministry of Information and National Orientation, initiated the Community Dialogue System, which involves an integrated approach to consultation and involvement at the community level through participatory approaches. In this approach, community leaders are trained in identifying risky behaviors, attitudes, perceptions and beliefs before, during and after avian influenza outbreaks. This system also integrates animal and human disease surveillance teams at community levels. Similar approach can be implemented in World Bank-financed CDD projects (e.g. Commune Health Approach in the Community Action Program II Project in Niger).

There is a provision for community-based animal disease surveillance and early warning networks in the GPAI framework document. This entails establishment at the community level of early warning systems to support a robust emergency reporting and feedback system for notifiable diseases. A critical objective would be to improve the commitment of all participants of the “epidemiological surveillance networks.” Training for animal health workers, and treatment of infected animals and reporting procedures would need support. Farmers would receive hands-on training in detection of clinical signs. Basic bio-security equipment such as sprayers and protective equipment would be provided as well.

Veterinary and Medical Education

Poorly equipped teachers make for poor graduates, and Bank-financed education projects should begin to support veterinary education in client countries. The avian influenza crisis has sensitized governments to the need for sound veterinary capacity, especially veterinary epidemiology. Short term training does help but does not address the larger constraint of weaknesses in medical and veterinary education. There is a serious need to address veterinary, and to a lesser extent medical,
curriculum reform in developing-world veterinary schools and faculties, a goal well beyond the scope of short-term emergency operations. Such reform will require engaging the ministries of education which are usually in charge of veterinary and medical education. Veterinary education enhancement as a regional project (e.g., in West Africa, South-East Asia) would make sense under the One Health concept, to build long term, sustained veterinary (and medical) capacity. Joint curricula for zoonotic diseases are especially necessary, obliging students of human and veterinary medicine to study the same material.

**Vaccination Strategies**

Much has been learned about poultry vaccination strategies since the H5N1 HPAI outbreaks began in 2003. While a number of commercial vaccines have the potential to reduce the level of circulating virus in poultry flocks, there are challenges. First, there is the issue of when to start. The World Bank’s publication on compensation (2006) recommends a shift from culling to vaccination, when about 5 percent of the animal population has the disease. However, as some countries ban the import of poultry products of vaccinated animals, countries that depend on export markets might rely longer on culling. Second, coverage must be considered. In order to achieve significant reductions in circulating virus, a sufficiently high vaccination coverage level should be reached (50 percent to 90 percent immunization of at least 50 percent of all flocks at risk of infection) with a vaccine that protects against most circulating viruses. This proves difficult for technical, logistical and cost related reasons, and calls for careful targeting of vaccination spatially, temporally, and/or by production system to maximize its impact and cost-effectiveness. Third, effective targeting requires risk assessments, for which data and expertise are often lacking. Strengthening the epidemiological capacity of national animal health systems is a major prerequisite for large-scale use of vaccination.

As indicated in FAO’s Preparing for Highly Pathogenic Avian Influenza Manual (2006), vaccination as a support strategy may be considered when the disease has spread to such an extent that it has overwhelmed the resources of disease control authorities or the economic cost of a widespread slaughter campaign cannot be borne. It can also be considered at an earlier stage when veterinary capacities prove to be very weak and insufficient to curb the spread of the disease. FAO and OIE have made recommendations for the use of OIE-approved avian influenza vaccines, and several such vaccines are commercially available. If used in accordance with FAO/OIE recommendations as indicated in FAO’s Position Paper on Avian Influenza Control Strategy and the OIE Manual for Diagnostic Tests and Vaccines for Terrestrial Animals, these vaccines provide excellent protection against clinical disease in chicken by reducing mortality and production losses. Vaccination of poultry also reduces the viral load in the environment, thus decreasing the risk of transmission to poultry and humans.

According to current OIE recommendations, HPAI-vaccinated poultry are not excluded from international trade, although specific technical guidelines must be followed to ensure that the vaccine is being applied properly and monitored effectively. Vaccination must be done in combination with other disease control measures, including the slaughter of affected flocks. Efforts to control the disease by vaccination alone, without slaughtering affected birds to reduce the virus load in the
environment, will probably not be successful. Depending on the incidence and distribution of outbreaks, vaccination may be undertaken around outbreaks (ring vaccination) or throughout the poultry population (mass vaccination).

There are a number of different avian influenza poultry vaccines available. Conventional vaccine is prepared from the allantoic fluid of infected eggs, which is inactivated and emulsified with an adjuvant. Attenuated live influenza virus vaccines are not recommended because of the risk that the vaccine virus could either mutate or re-assort with other influenza viruses to become virulent. Recombinant vaccines have been also produced, including fowl-pox virus with the influenza haemagglutinin gene inserted. The Manual elaborates further on vaccine properties, sourcing, and includes a sample tender document for inactivated avian influenza vaccines.

**Proposed Principles to Guide Global Allocation of Human Vaccines in the Case of Pandemic**

Providing access of people in all countries to vaccines and antivirals remains a major challenge. In response to the 2009 H1N1 pandemic, WHO established mechanisms to support “least-resourced countries” with access to vaccines through contributions from developed countries and allocations of a percentage of production from vaccine companies. Overall H1N1 flu vaccines for 10% of the recipient countries’ populations were distributed and the uptake (rate of utilization of available vaccines) was very high (much higher than in Western Europe and North America). For influenza, the major issues are technology resulting in long production lags and low production capacity, such that only a small part of the world’s population could receive the vaccine early on during the pandemic. Some of the problems in distributing vaccines are attributable to inadequate financial, technical, and logistical resources provided by national deployment plans. The Bill and Melinda Gates Foundation has set out the following framework to avoid possible delays to access in the future.

**A Framework for Sustaining Momentum**

1. The global community should take steps to protect all populations, including those without resources to protect themselves.
2. Vaccination should be considered in the context of comprehensive pandemic preparedness and response efforts in all nations.
3. Developed countries and vaccine manufacturers should urgently agree upon a mechanism to ensure access to vaccine by developing countries.
4. Influenza vaccine manufacturers should identify strategies such as tiered pricing and donations to make pandemic vaccine more accessible to developing nations.
5. Pandemic vaccines allocated to developing nations should become available in the same time frame as vaccines for developed nations.
6. The global community should obtain data to help establish a consensus on the safety and efficacy of adjuvants, and efforts should be made to ensure the fullest use of this and other dose-sparing strategies.
7. All countries obtaining pandemic vaccine should ensure that mechanisms are in place to provide the vaccine to their populations, to ensure that this scarce resource is not wasted, and donors should be prepared to provide resources and technical assistance to help countries bolster these mechanisms.

8. WHO is uniquely positioned to lead the global response to a pandemic virus and should support governments and industry in their efforts to implement these principles.

Source: Bill and Melinda Gates Foundation 2009

Environmental Aspects

HPAI has been recognized as an environmental issue, in particular with respect to the disposition of dead birds and laboratory biosafety and waste management. ‘Interim Guidelines for Managing Potential Environmental and Social Safeguard Issues in Bank-Assisted Avian Influenza Control Projects’ have guided staff on compliance with the World Bank environmental and social safeguard policies.

Compensation

The Learning Event presentation on compensation for culled poultry highlighted renewed interest from countries in developing compensation policies. This interest has been divided into four specific aspects:

1. Processes for integrating the compensation strategy within legal frameworks;
2. Development of specific Standard Operating Procedures to support the compensation strategy when implemented;
3. Development of sustainable compensation funds; and
4. Understanding the linkages between disease control (culling, safe disposal and disinfection) and compensation and the ability to source financing.

Using a general framework and guiding principles of compensation, work has begun in some countries to develop policies that are context specific. This has been done through consultation with a variety of stakeholders, including legal experts, the private sector, and government departments concerned. Initial strategies have been developed for ministries of livestock/agriculture to support and guide them through the legal process. To date, some of the main lessons learned concerning compensation have been the need for transparency, the importance of delinking disbursement and auditing, the relationship between compensation and increased reporting of disease, and the need to harmonize compensation across borders to prevent animal (and thus disease) movement. The World Bank/FAO/OIE publication “Enhancing Control of Highly Pathogenic Avian Influenza in Developing Countries through Compensation: Issues and Good Practice publication (2006)” elaborates further on compensation issues.
Animal Disease Control and Compensation Funds

Only 6 of the 25 Bank-financed projects with compensation facilities actually disbursed Bank financing for compensation (Vietnam, Bangladesh, Haiti, Nepal, Nigeria, Turkey). Most countries did not experience HPAI outbreaks, or financed compensation from other sources. In all projects with a compensation facility transparent compensation plans with clear procedures were developed. Where HPAI outbreaks occurred and compensation arrangements were in place, poultry owners received compensation for culled animals. Key weaknesses observed were: slow delivery of compensation payments; most plans did not update compensation rates over time; compensation amounts in some cases were inadequate; and the sustainability of Compensation Funds was not addressed.

Effective animal disease control requires reliable and adequate funding for compensation: Compensation Funds (and Animal Disease Control and Compensation Funds, see Box 2) need to be designed to be sustainable. Bank funding expires with project closing, but many countries have no provisions for continued funding after project closure. More attention needs to be placed on transparency, timely payments, and annual/seasonal adjustments of compensation rates. There are two key issues for moving forward. First, culling and compensation, which are only one element in an effective avian influenza disease prevention and control strategy, are equally important for various other animal diseases. Second, culling and compensation are more costly than effective prevention.

The following issues should be addressed in the future with respect to compensation:

1. How should a sustainable financing facility for epizootics prevention and control, including for culling compensation, be institutionalized?
2. Should the facility finance only compensation for culled animals (and possibly for animals demonstrably killed by specified epizootic diseases), or should it also finance disease prevention and control activities?
3. How should the fee of compensation be determined, i.e., using market prices, and if so, before or after the outbreak, or using the cost of production. The latter would have the disadvantage that it would favor the less efficient producers;
4. What should be the level of compensation, i.e. should it be the full price or certain percentage of the price. In most countries it varied between 75 and 100 percent, but some countries went lower, although experienced then also a reduced response;
   a. Should the funding be provided exclusively from the government budget –or should it also come from mandatory contributions from animal owners?
   b. Should the facility by managed by the Ministry of Agriculture –or should it be operated by a special institution established for this purpose?
   c. Should this facility cover only HPAI and poultry –or should it also cover other contagious diseases and other animals?
5. Should the coverage be expanded to other diseases and animals to support the One Health agenda?
6. How should animal owners be involved in a public-private partnership and in its funding and administration?

**Compensation Funds - Proven Arrangements**

In many countries, it may be appropriate that an autonomous animal disease control and compensation fund, as it exists in a number of European countries, should be in place. It should be a legally and operationally autonomous institution of public law and managed in private-public partnership (with direct involvement of animal owners in decision-making), with a mandatory membership of all owners of specified domestic animals and compulsory cost-sharing by animal owners. In addition, there is a need for governmental advance contribution during the start-up phase and in the event of inadequate financial reserves, which is later paid back.

The second best alternative is a government-run animal disease control fund administered by a ministry or governmental agency, and funded partially by budgetary allocations and partly by compulsory fees from animal owners or by fees on marketed livestock products. Funds are kept outside government budget and coverage is mandatory. The main drawback is no involvement of livestock owners in decision making on fees, compensation rates, or cost-sharing for disease control measures.

**Other Approaches**

There are many drawbacks related to compensation provided through ad-hoc allocation of government budget funds or from earmarked emergency funds: funding is only for compensation after disease outbreak while there is no funding for preventive measures, and arrangements are usually not in place in advance to respond rapidly. And there are additional risks: large unforeseen claims on budget resources, lengthy delays in budgetary appropriation and disbursement, and not compensating at all or only a limited number of animal owners.

**Private Sector Solutions**

Use of commercial insurance faces a range of obstacles: it is rarely purchased by anyone except large commercial producers; it is mainly used for high-value animals like racehorses or valuable breeding animals; and it is unattractive to insurers due to high risk and unpredictability of large-scale outbreaks. Similarly, mutual insurance will likely find it impossible to deal with high unpredictability of timing and scope of outbreaks. Also, there are very high premium costs to participants. Overall, among the key weakness is lack of compulsion to ensure compliance with essential public-good requirements of registration, reporting and culling. This could be addressed through legal requirement to obtain insurance, but would be very difficult to enforce.

**Existing Animal Insurance Schemes**

Animal insurance schemes exist in a few World Bank client countries (e.g., India, Kenya, and Mongolia). They typically address weather-related livestock losses (drought, unusually harsh winters), rather than losses caused by disease. A recent Bank review of 80 countries found that
insurance for infectious animal disease outbreaks exist only in a small number of countries. Livestock insurance providers want to see certain preconditions satisfied so as to make their own risk manageable and calculable:

- There is an effective and reliable veterinary service and a reliable and transparent system for reporting animal deaths and their causes.
- Catastrophic events (such as major outbreaks of lethal diseases) are excluded or handled by other means, such as a Compensation Fund.

Compensation Procedures in World Bank-financed Projects

Contingency components to deal with unforeseen emergencies such as compensation for disease outbreaks can be included in any project (and activated rapidly) as indicated in the World Bank’s Rapid Response Mechanism policy OP/BP 8.00, Rapid Response to Crises and Emergencies, and in the Contingent Emergency Response Components in Standard Investment Projects Guidance Note to Staff (2009). These components need not tie up scarce IDA funds, but can be financed once the emergency occurs, either by reallocation from other components of the project, or through additional financing. If the component has been properly prepared, including identification of financing options, funds will disburse quickly.

**Box 2: Animal Disease Control and Compensation Funds (ADCCF)**

Animal Disease Control and Compensation Funds exist and operate effectively in a number of European countries (e.g., Austria, Belgium, Germany, Greece, Netherlands, Switzerland). ADCCF is self-financing after the initial establishment period, and provide substantial and effective funding for disease prevention and control activities (e.g., mandatory vaccinations, serological testing, stall disinfection, carcass disposal).

Veterinary Law must establish basic parameters regarding epizootics control measures, including the right to compensation for animals killed by specific diseases or culled by government order. The legal basis for establishment and operation of an autonomous ADCCF can be provided within the Veterinary Law or through a specific legal instrument. It should specify the types of animals and diseases covered as well as the types and range of financial support for different epizootic/enzootic prevention and control measures (e.g., diagnostic testing, culling compensation, vaccination, carcass disposal, stall disinfection, etc.). Specific details regarding animal and disease coverage, fees, compensation payments and support payments for control measures are updated and published annually, such as in the Charter (or Statutes) and an Operational Manual.

The ACDDF Governance Structure should include a Supervisory Board, management unit staff, and an oversight ministry (typically the Ministry of Agriculture). Membership and annual registration is mandatory for all owners of those domestic animals that are specified by law.

The process of establishing an ACDDDF should be gradual. It should begin with simple structure and arrangements for poultry and HPAI, and the initial schedule of fees and compensation rates should be kept simple. In addition, refinements should be introduced once the system is well established, experience has been acquired and livestock owners have gained confidence that the system works for their benefit. Finally, it should be expanded to additional animals and epizootics/enzootics later.
Focusing on country-specific priorities.

Fees should be set annually by type of animal and may be adjusted to maintain reserves and/or (conversely) to avoid accumulating excess funds, and established in close consultation with animal owner representatives to ensure acceptability (about 0.5% of market value is considered appropriate). Fees for smallholders may be a fixed annual minimum or they may be waived entirely to minimize administrative cost and burden. Fees collected should be used only to fund eligible activities for the same type of animal; no cross-financing from cattle to poultry, etc, should be allowed.

The ADCCF is strictly a funding facility. Its mandate is to provide financial support to livestock owners for specifically identified and government-mandated animal disease prevention and control actions. The two main areas of financial support to livestock owners are: full or partial cost coverage for government-mandated disease control measures (e.g., vaccinations, serological tests, carcass disposal, etc.), and compensation to livestock owners for livestock lost to specific diseases and to government-mandated culling.

Measures to minimize or prevent outbreaks of epizootic diseases that merit ADCCF financial support include diagnostic testing, vaccination, stall disinfection, and carcass disposal.

Cost sharing arrangements may be differentiated by type of measure (e.g., ex-post reimbursement or up-front contribution), may provide full or only partial coverage of costs (e.g. 100% of cost of vaccine, but only 50% of cost of safe carcass disposal at rendering plants), and can be changed over time to meet public-good objectives (e.g., raising ADCCF contribution when a disease threatens to become more prevalent).

Source: ECA Region

Post-Project Sustainability

Upgrading veterinary and medical services escalates the incremental recurrent operating costs attached to such services. After project closure, such additional costs may not be sustainable, leading to a rapid collapse of any gains made. This post-project shock becomes even more severe if client governments do not contribute counterpart funds to the project. In many AHIF projects, especially those funded by the Japanese Policy and Human Resources Development (PHRD) Grant, AHIF, IDA, or donor grants, counterpart funds were not allocated, as annual budgets were already locked in at the time of project preparation. This constraint can be alleviated by being more insistent in having client governments phase in counterpart funds, if possible from the onset or in the next available budget, and gradually increasing their commitment over the time span of the project. If these funds are targeted to match the projected incremental operating costs generated by the final project year, the post-project shock will be lessened or may even be alleviated. This will require project managers and client governments to agree on a strong rationale and incentive that warrants sustained government support of its public health and, especially, veterinary services. This can be done by means of a PVS assessment that leads into a gap analysis and formulation of appropriate programs.
The Human Health Component

Two issues stand out that require resolution: (a) the costly procurement in a few projects of antiviral drugs and antibiotics, and (b) inadequate pandemic preparedness.

Antiviral Drugs and Antibiotics

Advance purchase of antiviral drugs for case management in AHI projects has been a problem in several instances. The drugs were stockpiled in central warehouses or distributed to strategic peripheral locations, and had a shelf life of three to four years. Most countries, however, neither purchased antiviral drugs, nor stockpiled antibiotics. This issue could, however, become pertinent for more countries if antiviral drug prices were to fall and/or their demonstrated effectiveness were greater and more certain. In that case, a more approach is needed, in which fewer project funds are committed up front. A scheme needs to be arranged with suppliers under which, for a significant advance payment, they commit to deliver antivirals upon short-term request on a first-refusal basis within an agreed time span or to procure these drugs in several smaller allotments as the need arises. If the time span expires and no order is placed, the commitment payment is forfeited. In this way, only part instead of the full amount of project funds allocated is lost.

Pandemic Preparedness

Pandemic preparedness components have often not been implemented fully. Even in the health care sector, most pandemic preparedness activities are hospital- rather than out-patient oriented and some concentrate on setting up isolation ward capacity with ventilators, personal protective equipment and antiviral drugs. No hospital will be able to accommodate the hundreds, or even thousands, of cases that may present themselves for treatment. Preparing emptied out school buildings and stadiums to serve as public sick wards, and practicing triage (beyond medical help; hospitalize; send home) on incoming patients will be a far more realistic approach (China, Vietnam). Simulation exercises should be designed and implemented, even if they are table exercises.

Pandemic preparedness activities should look beyond this narrow horizon and go well beyond the ministries of health. Indeed, they could be directed by a central ministry, such as prime minister’s office, disaster management agency, or ministry of interior. The response plan has to be multisectoral, focus on continuity of operations and critical infrastructure, and define the roles for civilian authorities, the military, and private sector – as is normally the case with preparedness for major disasters. The Ministry of Health should support this process by ensuring they can provide epidemiological information and advice on medical care. The health sector may also provide training in practical, public self-help tools (social isolation, personal hygiene), mass sick ward capacity, and engaging civil society groups, which may save more lives than readying a few hospital isolation wards. Many of the pandemic preparedness activities outlined by WHO have been incorporated into the Action Plans of client countries, but the scope of preparedness planning often remains well below a realistic assessment of projected needs for medical assistance in case of a
pandemic, as well as below a realistic expectation of the disruption to the economy and its critical infrastructure that may ensue and cause more much more economic and social damage than the illness.

Communications and Information

The communications and information component has been the most problematic to implement. Seventeen percent of Grant Reporting Management (GRM) files reviewed rate Communications Unsatisfactory. These ratings are attributable to a variety of factors, including implementation costs and the inexperience of responsible implementing agencies and line ministries. Communications and information can be improved in at least four areas: (a) better integration between project activities and communications strategy and media messages, (b) more emphasis on behavior change rather than traditional multimedia messages, (c) more and better outreach to grassroots rural and urban communities; and (d) more participation of technical specialists in formulating messages to raise public awareness.

Effective communications and information is acknowledged to be the most crucial element in ensuring public understanding and cooperation with avian influenza prevention and control interventions. However, multimedia messaging often fails to reach, or convince, stakeholders to change their behavior and accept and follow their advisory messages, especially at the grassroots level.

Behavior Change

The concept of fostering behavior change, rather than generic public awareness messaging, needs to be introduced more directly and become better integrated into the animal and human health components. Because they are packaged into separate project components, communications and information tend to be implemented as an activity separated from Animal and Human Health component activities. Communications and information delivery is expensive, as messages have to reach thousands, even millions, of recipients. Developing, printing and distributing messages through the multimedia, especially radio and television, are costly undertakings. To make them more cost-effective, the focus should shift to stimulating behavior change that is directly integrated into project activities, rather than act as stand-alone interventions. Specialist inputs into the design of the messages are critical. In several cases, wrongly or unclearly worded messages have led to unnecessary public anxiety and unwarranted drop in the consumption of poultry products, resulting in dramatic drops in farmer income.

A few examples of encouraging effective behavior change include:

- Teaching villagers to shift from backyard, free-ranging poultry keeping to confined, more biosecure poultry raising, as done in a Vietnam.
- Convincing municipalities to upgrade a few of their live-bird markets in each large city into model markets, in which cement floors, one-way public traffic flows, separating ducks from...
poultry, a water supply to allow for disinfection, and replacing wooded poultry transport
crates to plastic ones, are demonstrated (Yemen, Nigeria, Vietnam).

- Working with communities to participate in early warning networks to rapidly detect unusual
  poultry die offs and the presence of people with influenza-like illness symptoms (Indonesia,
  Thailand).
- Working with commercial poultry associations and private poultry veterinarians to improve
  poultry farm biosecurity, introducing association-supported member training programs
  (Jordan), and converting a few poultry farms into demonstration farms with simple
  biosecurity measures (netting, foot baths, perimeter fences around large farms) (Moldova).

In countries where avian influenza has not entered but which are at risk, finding the right incentives
to ensure behavior change becomes more difficult and must focus, aside from ensuring human
safety, on the public’s confidence that its government can protect them. A few important behavior
change interventions are suggested:

- Convincing senior government decision makers to undertake transparent, widely-advertised
  simulation exercises to ensure the public that their government is ready and capable to deal
  with an emergency (Moldova), rather than avoiding such simulations for fear of alarming the
  public.
- Making certain that an equitable and transparent compensation mechanism is in place and
  that its terms of reference are widely known and understood beforehand by all poultry sector
  stakeholders (Vietnam, Nigeria).
- Introducing the necessary behavior change in medical services personnel to develop realistic
  human case management and pandemic preparedness programs.
- Conducting well-publicized simulation exercises to show the government’s resolve and
  confidence.

With the restructuring of emergency operations from a short two- to three-year lifespan to standard
five-year operations, there is a chance to introduce more and better hands-on behavior change
interventions. A review of existing communication activities should therefore rank high on the list,
should project restructuring be considered. If it is not, such activities should be reviewed to include
some of the behavior change activities outlined above.

More Outreach to Community Groups

More outreach programs should involve civic society groups, including youth groups, religious
groups, statements by respected village elders, migrant populations (guest workers), associations, and
private sector advocacy groups. UNICEF gave an important presentation on the UN agency’s
activities in ongoing communications to promote behavior change and how those activities related
to the WHO’s emergency communications when an outbreak occurs.

Communication interventions for behavior change have been able to generate knowledge and create
awareness. Selected country analysis shows that communication interventions – especially in the
public health domain – have contributed to the reduction of infections. However, an increase in knowledge does not necessarily translate into permanent behavior changes.

The following gaps should be addressed:

- There has been limited coordination in implementation at national and sub-national levels.
- Communication interventions have primarily focused on preventing human infections and there were very limited efforts to prevent and contain infection among poultry.
- Adoption of recommended protective practices by the rural population for prevention of human infections has been often only partial and selective.
- Public compliance with control measures has been low due to limited public engagement and dialogue, particularly with affected stakeholders.

Recommendations

First, strong public engagement is critical for success in containment efforts. The implementation of community-based initiatives should promote dialogue and ensure feedback to build trust among the public and the affected stakeholders. There is a need to harmonize activities and messages and to plan for longer-term mass media interventions and community-based initiatives. Second, building on the response to the H5N1 epizootic, there should be a shift from an emergency communication mode to a mid-to long-term integrated communication approach for endemic and emerging diseases. Furthermore, behavioral interventions should be complemented with multiyear investment funded by development partners and governments. Lessons learned from technical and operational experience discussed above informed One Health operationalization elaborated on in Chapter 6.

For additional information, please refer to the UNICEF website: http://www.unicef.org/influenzaresources/ for additional information.
5. The One Health Concept

The H5N1 HPAI experience suggests that significant gains can be made in the efficiency and effectiveness in detecting and then controlling emerging and endemic zoonotic diseases. The exchange of information in the joint planning and coordination of activities at national and field level among public health and veterinary services was instrumental in controlling H5N1. Much of the collaboration was informal. More formal and permanent arrangements are needed in order to be prepared when the next outbreak emerges. The adoption of a One Health Approach would support more effective institutional arrangements and technical framework, which in turn could lead to a more sustained approach for early identification and control of emerging and endemic zoonotic diseases. Based largely on the presentations and discussion in the Hanoi meeting, the One Health concept and its implementation are described in the following chapters. This chapter discusses defining elements of the One Health concept, including the “horizontal” (cross-sector) orientation of integrated disease surveillance and control, and the institutional challenges that need to be overcome to achieve this integration.

One Health is a framework for enhanced collaboration in areas of common concern between different but interacting health domains. Where those domains overlap, as illustrated in Figure 3, One Health applies. An initial concentration on zoonotic diseases will reduce risk, improve public health globally and support poverty alleviation and economic growth in developing countries. Alternatively, the One Health concept is a framework for fostering more effective control across sectors, and involves a better way to deal with risks at the animal-human-environment interface.

Figure 3: One Health Concept

Vertical and Horizontal Orientation in Disease Prevention and Control

The division of labor among public institutions makes for a segmented or vertical organization of work in which institutions operate independently of one another and from the perspective of their respective discipline or sector. This unavoidably leads to gaps and, sometimes, overlaps. For practitioners working in this framework, the starting point for action tends to revolve around the question “What am I responsible for?” rather than “What needs to be done?” Figure 4 presents these two orientations. Changing the organization of work across disciplines to start with this latter
question implies a substantial reorientation along horizontal lines in which regular communication takes place between practitioners at work in different disciplines and sectors. This does not imply an amalgamation of work but rather the creation of a culture in which practitioners are more likely to understand the significance of a finding or event within their own field for practitioners in other fields.

Figure 4: Vertical and Horizontal Orientation in Disease Prevention and Control

The One Health concept makes sense. It facilitates faster understanding of the biology and epidemiology of newly emerging zoonotic diseases. It makes for more effective surveillance of known, and potentially of unknown emerging diseases. It makes for more effective resource use when control measures need to be introduced. It also galvanizes cross-sectoral and inter-disciplinary collaboration at national and supra-national levels. Ultimately, the One Health approach results in stronger animal and human health systems for early detection of and rapid response to zoonotic diseases.

Why is a One Health approach needed?

- The number and severity of outbreaks of emerging and re-emerging diseases is increasing significantly, with over 75 percent of human pathogens being zoonotic arising at the interface between domestic animal, human and wildlife domains within the context of the overall environment.
- Understanding and managing the complexities of social and ecological interactions between humans and animals requires integrated policy development. Prevention of disease is based on broader, multidisciplinary partnerships beyond the animal and human health sectors, examining broader health, environmental, and economic impacts.
- HPAI and other zoonotic diseases cause significant losses in the agricultural sector globally, and continue to jeopardize agricultural productivity, food security and the livelihoods of farmers (and by extension, transporters, marketers, etc.) in some of the world’s poorest countries. For example, continued circulation of H5N1 HPAI in domestic poultry is limiting development and expansion of the poultry industry. Existing high-burden animal and human diseases often affect the most vulnerable and marginalized people.
One Health Benefits

The One Health approach to collaborative human and veterinary medicine and environmental health promises to greatly improve both the timeliness and the accuracy with which diseases at the human-animal-ecosystem interface are detected and diagnosed. It can improve the efficiency of the human and veterinary health services, by enabling them to do more with the same total resources. The reduction in time that elapses between the emergence of a threat and the launch of an effective control program is very likely to save many lives. It also greatly reduces the financial costs of control. Depending on the disease, these costs can increase dramatically as the period between identification and action is prolonged. The relation between time and cost is illustrated in Figure 5.

Figure 5: Delay in Disease Reporting and Its Relationship to the Costs of Control

One Health also provides the platform and access to the required expertise to prepare national risk assessments and to analyze the economic burden of disease on human health and impact on trade, GDP, poverty reduction, gender inequities, nutritional security, etc. Ministers of finance, health, agriculture, and the environment need to jointly assess the full impact of emerging and re-emerging zoonotic diseases. Economic analysis is essential to advocacy and promotion of the rationale for disease prevention and control, drawing on One Health approaches, within governments, with parliamentarians, among the public, and to mobilize donor support.

One Health provides the context for addressing broader development issues, a number of which are illustrated in Box 3. It provides the platform for collecting information on the gaps in the system, using for animal health systems the PVS tool with follow-up gap analysis and strategic plans and for human health systems through the IHR tool.
Box 3: Addressing Broader Developmental Issues through One Health Investments

Many of the factors related to disease emergence, re-emergence and spread—such as expanding livestock production, mixing of livestock species, encroachment by settlers into wild forest areas, and peri-urban livestock keeping—are intimately linked to livelihoods, often those of very poor people. While rural communities aspire to improve the health of their families and their animals, they may have little or no access to human or animal health services. Women, who are often key small livestock keepers, are particularly marginalized from support services. Poor people are also confronted with common human and animal disease problems which are a far greater priority to them than concern over potential pandemic risks – even if they are aware of those risks.

Surveillance therefore needs to be embedded within health management at the community level, and it needs to account for local livelihoods. This entails the use of bottom-up approaches that recognize the needs of those most directly concerned. Local communities have to be persuaded to become involved and to remain so over time. Special efforts are often required to reach certain groups within the community, especially women. Communications programs that both raise public awareness and deliver timely information which the community-audience finds useful and relevant are essential. Community-driven development (CDD) projects in particular can be instrumental in fostering this level of local engagement. In the Livestock and Community Driven Development Portfolio Review 2004-2008, 13 CDD projects addressed animal health, five addressed waste management, and three food safety.

The following should be considered in the design of follow-on One Health investments:

- Animal diseases, the lack of adequate food hygiene and resulting food borne illnesses can threaten human health, disrupt markets and trade, reduce productivity and deepen poverty. Improving the management of livestock with a view to preventing and controlling diseases can provide significant economic, social and human-health benefits for the poor and for society at large.

- Public animal-health and food-safety systems need to recognize that the impacts of livestock disease and foodborne illnesses vary across countries and production systems depending on their economic status. The capacities of different groups to respond to these challenges, and the incentives needed to encourage them to do so, must be considered in the design of disease-control and risk-management strategies. Careful cost/benefit analyses are therefore required.

- In the same context, and with limited resources, in country regional priorities need to be established. The identification of “hotspots,” i.e., areas where several of the drivers of emerging zoonotic diseases are present, with strengthened surveillance and control capabilities, might be preferable over countrywide blanket coverage.

- The technical and institutional capacity – food quality and safety laboratories, human and financial resources, national legislative and regulatory frameworks, enforcement capacity, management and coordination – to ensure compliance with international standards, which compromises food safety. Weaknesses in the above mentioned areas not only threaten public health, but may also reduce access to global food markets. Large, strategic and sustained investment is needed in national animal-health and food-safety infrastructure in developing countries to reduce the risks to human health and to allow growth in trade and markets, in
ways that can contribute to lifting small livestock keepers out of poverty.

- The above country interventions should be supplemented by global action as new pathogenic agents will continue to emerge, and the risk of spread has to be addressed specifically. An adequate global framework is necessary to address emerging and re-emerging zoonotic diseases.

Selected ongoing and pipeline One Health follow-on investments addressing the above mentioned issues are highlighted in Annex 15.

What are the challenges?

A variety of institutional barriers must be overcome to achieve a One Health operational approach - barriers to the creation of health systems that functionally collaborate on integrating services that have traditionally been delivered by individual sectors with little or no collaboration or interaction between them. Some of these barriers are erected inadvertently by the bureaucratic division of responsibility between institutions. Some of them relate to budgetary constraints, unequal institutional capabilities and differing cultures, limited communication of information, the absence of a shared vision, disincentives to working horizontally, and legal barriers. Overcoming such constraints and barriers in the pursuit of One Health will also make an important contribution to implementing “New Public Health,” as well as “Health in All Policies” approaches. In particular, scarcity of resources and financial constraints indicate the need for improved cost efficiency and collaboration. Joint vaccination campaigns, laboratory diagnosis, communication, and surveillance programs across sectors are a few examples of how this could be achieved.

The most persistent, and arguably the greatest challenge is likely to be sustaining public interest in preparedness over time. The perception is already growing that the pandemic risk of H5N1 has passed, or that it has been successfully dealt with and is now declining. Many believe that the systems have already been developed as fully as is necessary, that they have fared reasonably well, and there is little or no need for further vigilance. This perception raises the risk that the system will be the victim of its own success, and that the resources made available to it will decline as public awareness wanes. Yet the likelihood that a severe pandemic may occur in the future has not been offset in any way by the success to date in controlling H5N1. Although much has been achieved, response capacities and capabilities are likely to decline rapidly if they are not maintained. Continued attention on maintaining and building animal and human health systems is therefore needed.

For more information on One Health, please refer to the ARD publication entitled People, Pathogens and Our Planet - Volume 1: Towards a One Health Approach for Controlling Zoonotic Diseases.

World Bank staff are invited to contribute to One Health operationalization discussion on ARD/HDN collaboration space http://ardtg2 -> click on Operationalize One Health. Presentations from the event are available at http://onehealthvietnamevent.
6. Making One Health Operational

A widening consensus among informed human and animal health authorities, scientists, and policy makers now surrounds the notion that the effective prevention and control measures against emerging and re-emerging infectious diseases will require multisector strategies and active collaboration across professional disciplines. Both national and international institutions need to take actions to bring about such a working environment. Yet national governments are clearly the principal agents in bringing this to pass, with international agencies playing a largely supporting role. Each country must determine its own way forward, based on specific needs, capacities and institutional structure. Participants of the Learning Exchange identified a series of practical steps that are essential to making One Health operational – beginning with the country level and then proceeding to the roles that international agencies should play.

Step 1: Identifying in-country champions

In-country champions play an indispensible role in consensus building, priority setting, and advocating for the commitment and allocation of financial resources. Supporting them with information and technical advice is one of the most important things that can be done to create leverage for more effective institutions and coordination processes.

Step 2: Making the case for early identification and control of zoonotic diseases

Analysis of the economic burden of disease on human health and impact on trade, GDP, poverty reduction, gender inequities, nutritional security, etc. should be conducted. Economic analysis is recognized as essential to advocacy and promotion of the rationale for disease prevention and control, drawing on One Health approaches, within governments, with parliamentarians, amongst the public, and to mobilize donor support.

The economic costs of zoonotic diseases and the prospective costs and benefits of establishing effective institutions to prevent and control them are not known. At present, all we are able to say is that the potential costs of emerging zoonotic diseases are very large, and quite possibly catastrophic – and that the costs of preventing them are rather small by comparison. This is not enough. The scarcity of reliable data to measure these costs and benefits seriously detracts from existing efforts to “sell” One Health to public officials and policy makers. They require more and better information than we are currently able to provide them in order to justify the investment of substantial volumes of public resources in improved disease management. Also, they have to be able to plausibly demonstrate what they will get for their money – and in the case of disease prevention, what they stand to save. Developing a methodology to verifiably quantify the potential costs of emerging zoonotic diseases, and the relative costs and benefits of moving to One Health is therefore an urgent priority on the part of livestock practitioners.
A number of economic analyses have been undertaken to assess these costs and benefits, but they have used different assumptions and arrived at different results. Encouraging consistency in the conduct of such analyses is one of the purposes of the methodology employed in the forthcoming World Bank-commissioned tool “One Health Framework for Estimating Economic Costs of Zoonotic Diseases on Society” which facilitates the estimation of the costs and benefits of controlling zoonotic diseases. This tool has been introduced in ECA and implemented (with modifications) in the Central Asia Region One Health project. The International Food Policy Research Institute (IFPRI) gave a detailed presentation of this work. It is presented in Annex 10.

Efficiency and effectiveness gains become achievable through the introduction of One Health. Quantitative information on the efficiency gains (cost savings in preparedness and control of potential pandemics) and effectiveness (gains in accuracy and timeliness of the diagnosis of the disease) is not available. A Knowledge Product is currently being prepared at the World Bank, based on a number of case studies, to estimate these gains.

Step 3: Assessing the needs of the services

Under this step it is critical to systemically address the need of the public health and veterinary services. Over the last years powerful tools have been developed. They are described below.

The Performance of Veterinary Services, Gap Analysis and Strategic Plan. The OIE PVS Program has now assumed the pre-eminent role in evaluating the capacity of these services in client countries. The results of the evaluations are applied directly to project design. Of the 108 evaluations that have been requested by client countries as of Spring 2011, 99 have been completed and 72 reports have been processed. The information generated is used to guide investment in national animal health systems. The OIE has also received funding to conduct PVS Gap Analysis and will work with the EC, FAO, and World Bank in preparing related investment programs. The PVS tool is described further in Annex 12. The following diagram is the visual representation of the OIE strategy regarding the use of OIE standards on the quality of veterinary services and guidelines on veterinary legislation.

The PVS pathway is instrumental for adopting a systemic approach to the strengthening of animal health services. The PVS exercise provides the basic diagnosis, with a rating based on mainly qualitative assessment of the current strengths and weaknesses of the veterinary service. The subsequent gap-analysis and the strategic plan sets the stage for specific activities to be supported based on the priorities emerging from the PVS tool, the gap-analysis and the availability of government budgetary resources. The government and the ministry responsible for veterinary services would need to demonstrate commitment to the strategic plan. Emphasis would be on systemic action rather than response to a specific disease emergency. Generic Terms of References

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4 The OIE Tool for the Evaluation of Performance of Veterinary Services is available on the OIE web site at: http://www.oie.int/fileadmin/Home/eng/Support_to_OIE_Members/docs/pdf/A_2010_PVSToolexcludingindicators.pdf
are being developed, and the World Bank could offer learning events and provide guidance on formulation of strategic plans with the OIE.

Figure 6: The Performance of Veterinary Services Pathway

The International Health Regulations. Public health systems now have access to a tool similar to the PVS tool within the framework of the IHR (Annex 12). The Protocol for Assessing National Surveillance and Response Capacities, published in December 2010 covers an assessment of the required core capacities in surveillance and response to all public health emergencies of international concern, including zoonoses with pandemic potential.\(^5\) It provides detailed checklists on issues such as legislation, communication, surveillance and response capacities, and level of preparedness. It is especially meant to help countries to assess their needs in meeting the mutually agreed IHR core capacities in 2012. These assessments would form the basis for development of a country specific strategic plan with a detailed budget, schedules, and addressing alignment with and capacity to implement IHR. ECA has adapted PAHO public health gap analysis toolkit as an analytical tool to evaluate 11 essential public health functions at the national, regional and local levels, with a specific focus on zoonotic diseases. The ECA Public Health assessment tool was piloted under the Central Asia Region One Health project in 2011.

The One Health Operational Guide and Self-Assessment Tool (draft by the Agriculture and Rural Development department in the World Bank) helps to assess core attributes and functions that support integrated or horizontal management of public health risks across health sectors. This assessment will cover zoonotic diseases, food safety, and environmental threats, such as pollution

and toxic spills. It is developed under a broad partnership, which includes the Canadian Public Health Agency, the US Centers for Disease Control, FAO, OIE, the US Department of Agriculture, the World Bank and a number of independent consultants.

The above mentioned World Bank documents are not alternatives or substitutes for other guidance documents or assessment guides offered by international standard setting and development agencies. Rather they are intended to support those national and international leaders who seek to advance a One Health approach by fostering horizontal coordination and synergies across these systems.

**Step 4. Joint priority setting and preparedness planning, including the identification of hot spots**

Hotspots refer to those contexts in which climatic, social, and economic conditions—including the state of sanitation infrastructure and services and the proximity of humans and animals—provide a particularly favorable environment for diseases to emerge or re-emerge. Their identification is important, because it enables the concentration of surveillance activities on these hotspot areas, rather than providing blanket coverage of an entire country, and a greater efficiency in the use of scarce resources.

At the national level priority setting entails development and application of disease prediction models, which can be at the global scale (see Figure 7) or at country level (see Box 4).

**Figure 7: Hotspots of Potential Elevated Risk for Disease Outbreaks under El Niño Conditions: 2006–2007.**

Adapted from Institute of Medicine (2009), *Sustaining Global Surveillance and Response to Zoonotic Diseases*. NRC, Washington DC.
Box 4: Predicting Rift Valley Fever in Kenya

The outbreak of Rift Valley Fever (RVF) occurs from time to time in East Africa, causes important human losses, and triggers trade-bans, thus affecting poor producers. Past outbreaks had been associated with increased rainfall. On the basis of these findings, the Center for Disease Control (CDC), in collaboration with WHO and FAO developed a model, which, using increased vegetation cover data for future RVF hotspots. On the basis of this model prediction, surveillance activities in North West Kenya were strengthened, the first case detected early, and measures taken to reduce the incidence and spread of the disease. As reported: the early warning enabled the affected countries, in collaboration with WHO, FAO and CDC to mobilize resources to implement disease mitigation and control measures and prevent its spread to unaffected areas (Anyamba, et al 2007).

The United States Agency for International Development (USAID) is supporting a major exercise in improving the tools for hotspot identification, in a project led by the University of California at Davis. In those hotspot areas it is even more important to:

- Integrate human and animal surveillance and diagnostic procedures and capacities, based on good communications and prompt sharing of information.
- Establish sanitary mandates/Terms of References of human and animal health professionals and institutions, in particular for remote areas.
- Develop high level, cross-sectoral integration/management/policy-making capacity (cabinet level) to override political considerations in favor of technical criteria in the selection of hotspots.

The GPAI and, especially, the preparation of INAPs, have shown the potential gains from joint preparedness planning exercises between public human health and veterinary services. More attention is still needed to reduce transaction costs of these joint exercises. Also, there is need to ensure that these plans remain relevant, realistic and implementable, for example, through simulation exercises (Annex 9).

Step 5: Preparing and establishing the appropriate enabling regulatory, institutional and financial environment

Legislation and regulatory frameworks that promote One Health through obligatory disease reporting and decision making processing, etc. will play an essential role in establishing the kinds of governance that is required for systematic cooperation across sectors. With a proper legal and regulatory framework and appropriate training, certain select public health activities could be shared—for instance, in surveillance by human and animal health field agents. This might require changes in the mandates of the respective professionals and paraprofessionals. Other changes might be required in regulating compensation and other incentives for early reporting of diseases and inter-service communication.
Establishing an appropriate institutional framework, which facilitates enhanced cooperation and
communication among human, animal and eco-system health agencies, can range from setting up
memoranda of agreement between the services, joint One Health task forces or permanent teams to
partial-integration of the services in certain areas of overlapping work. Strengthening institutional
arrangements is a part of national One Health agendas in which international agencies can be of
considerable service to national governments. The purpose is to design institutional relationships
and mechanisms—and perhaps even new institutions—that facilitate effective and efficient
prevention, detection, and control of zoonotic and other diseases of national or international
significance.

Depending on the capacity of public institutions within a country, a number of options are available:

- A permanent body that coordinates the preparation and regular update of contingency plans
to deal with the eventuality of an outbreak. The coordination function might take place
through the exchange of memoranda of agreement among the different sector agencies
concerned. The body itself may consist of or be served by a number of working groups.
- Coordinating authority conferred as a function of executive office, such as a prime minister
or deputy minister, who is served in this capacity by an advisory committee that operates
with his or her authority.
- Special One Health teams, composed of representatives of the human, animal, and
ecosystem institutions, with particular responsibility for diseases at the animal-human-
ecosystem interface.
- Creation of an independent agency for public health, including zoonoses and food safety.

Providing an appropriate incentive framework through the establishment of joint budgets of the
services, and the provision of special grant mechanisms for One Health activities is also an
important element of step 5. Incentives that lead people to place a premium on collaboration and
resource sharing would need to be introduced. This can include shared budget lines between
different agencies and systems of matching grants, with increased cooperation leading to increased
budgetary support. An overall increase in funding would have to be based on the results of the risk
assessment.

Implementing joint surveillance and diagnostic systems for pandemic and endemic diseases can in
many cases apply to disease risk in general. Surveillance and control systems that focus on pandemic
diseases can be applied to other diseases as well. There could be synergies between monitoring the
risk of pandemic diseases (i.e., both zoonoses with pandemic potential such as influenza in animals
and diseases that have caused an epidemic or a pandemic in humans) and monitoring the risk and
incidence of persistent enzootic (endemic in animals) diseases.

Preparing and disseminating joint communications can be instrumental in cultivating cooperation
between government agencies responsible for different aspects of One Health. Action is required at
two levels. First, human and veterinary health channels to communicate information about disease
outbreaks need to be harmonized. Second, communication of the different agencies on a disease outbreak needs to be correct and consistent. Human public health agencies, in particular, should always consult the veterinary services when planning to make statements about zoonotic diseases. This can help avoid confusing the public and forestall harm to animals, livestock producers, and economies more broadly (such as has occurred during the 2009 H1N1 pandemic, for example).

Step 6: Developing educational curricula, in particular at the university level, which integrate human, veterinary and eco-systems health

The sustainability of the One Health approach depends on the in-country human resources. A key constraint on the response to H5N1 has been the lack of effective capacity in the existing network of human health and veterinary educational institutions in most developing countries. Ad hoc, short-term, project-oriented training by international partners has had benefits, but it does not support medium- and long-term development of these critically needed capacities. Commitment to improvements and investments in educational institutions including applied research are required. Ministries of Health, Livestock and Education should jointly prepare plans to this effect. The feasibility of joint courses on zoonotic diseases for medial and veterinary schools students should be explored.

Step 7: Establishing the appropriate financial instruments

Financing Framework. Because the prevention and control of HPAI and other emerging zoonoses with pandemic potential are a global public good, providing financing on grant terms is appropriate. A financing mechanism similar to the GPAI would need to be established to channel World Bank and other donor support. However, lack of grant funding is currently a challenge. The amount of funding that is available continuously fluctuates as public perception of different disease threats rises and falls. Donors are more interested in controlling emerging diseases than endemic ones. Developing countries on the other hand assign greater priority to existing diseases and relatively less priority to emerging ones. They are often unwilling to borrow with the purpose of controlling emerging diseases, and this limits the role the Bank can play. Suitable funding options might include:

- Existing projects (re-allocation, additional financing) and GPAI projects restructuring;
- Other WB grants available (e.g. PHRD);
- Avian and Human Influenza Facility 2 (AHIF2) – A One Health Multidonor Trust Fund could be established, administered by the World Bank or another international agency to operate as a global fund implementing the key components of One Health at the country level. There are many arguments supporting AHIF2 as indicated in Chapter 5, including: a continued case for special emphasis on zoonotic diseases, need for a multisectoral approach, need to move away from addressing only pandemics, and bringing the animal and human health systems together;
• Pooling resources with other creditors and donors, including corporations, foundations, NGOs, sovereign wealth funds, in order to finance a government expenditure program in a sector or sub-sector of a country under P4R; and

• Other funding mechanisms such as a levy on exported meat or drugs, as proposed in the World Bank publication People, Pathogens and Our Planet: Towards a One Health Approach.

Prerequisites for AHIF2 or other sources of grant financing at the country level might include:

• An assessment of animal health system (OIE-PVS with follow-up gap analysis and strategic plans);

• An assessment of the human health system (WHO Protocol for Assessing National Surveillance and Response Capacities, with strategic plans);

• An assessment of progress for the implementation of One Health using A One Health Operational Guide and Self-Assessment Tool (draft, ARD), and the Gap Analysis Tool for Zoonotic Diseases: Evaluating Performance of Zoonosis Control in Public Health Systems (draft, ECA Region); and

• A commitment from decision makers in the human and animal health sectors to introduce One Health.

Financing instruments. Similar to GPAI, an APL could be applied at the country level, but rather than applying a “horizontal” orientation for broad geographic coverage, allowing for greater flexibility over time. If a country level APL is considered, important questions to address will include the following: 1) Is there a full agreement of all institutions on the long-term (normally 7-10 years) commitment? 2) Is there a long-term commitment from the World Bank to support the concept of structural change in the way public health and veterinary services operate, including One Health? 3) Is the flexible budgeting allowed by an APL essential for the success of the investment, or would a more precise project description be preferable? If not, other instruments to support One Health might include:

• Technical Assistance Loans (TAL) to build the initial institutional capacity for One Health, are particular appropriate for the introduction of One Health. They can be combined with Technical Assistance (TA) to help (a) properly design, prepare, and implement lending operation, (b) undertake analytical work necessary to underpin reform or policy development, and (c) strengthen human and institutional capacity for policy reform and sustainable development.

• A series of stand-alone Specific Investment Loans (SILs), with clearly defined investments; and

• The World Bank’s new instrument – Program for Results or P4R – provides a platform for the institution to pool its resources with those of many other creditors and donors, including
corporations, foundations, NGOs, sovereign wealth funds, in order to finance a government expenditure program in a sector or sub-sector of a country.

**Project Design.** One Health follow-on investments can be implemented in the short term in many World Bank projects, particularly in those which address food safety, bio-security, livestock development, livestock disease control, livestock waste management, including those with public health components and activities. Even though they are not One Health activities per se, these are issues of national importance and of utmost importance to the prevention and control of zoonotic diseases. GPAI projects can also be redesigned to incorporate One Health-related activities. Self-standing One Health projects and multisectoral projects with One Health components are desirable in the longer term; a draft One Health operational template is provided in Annex 14 in this respect.

The One Health operational challenge is three-fold. First, decision makers have to be made aware of the benefits of One Health in addition to its more obvious applications to public health and livestock production. They need to understand that One Health also carries major pay-offs in terms of economic efficiency in multiple sectors including farmers’ income, trade and tourism. Second, incentives are required to place the One Health agenda firmly within national and regional strategies in a way that reflects the priority it is assigned globally. Third, the World Bank needs to develop a working framework for its support to One Health in a way that builds upon the experience of the GPAI.

Building on the joint strategy developed with the WHO, FAO, and OIE, the World Bank should further engage technical agencies to define tools which help make the One Health approach and agenda operational, according to the key regulatory, institutional and financial measures mentioned above.

**Initial Experiences with the Implementation of One Health**

While the general concept of One Health is quite universally accepted by national and international public human and animal health institutions, actual implementation of the concept at a permanent and comprehensive national scale is still rare. Canada and Denmark have made some good progress, but almost all other experiences are at the level of one disease or disease group, or one function (understanding the epidemiology), and in a time-bound project mode. This provides some interesting demonstration material, but in most cases it does not allow solid conclusions on the efficiency or effectiveness of the approach. Annex 13 summarizes experiences with the implementation of One Health in Tanzania, Chad, Kenya Madagascar, Mongolia, Canada and Denmark, and also includes respective sources for more in-depth review.

From the World Bank side, some projects with significant One Health features are already being implemented and this should continue, as piloting is needed to inform future program development (e.g., the joint pilot program in epidemiology training in South Asia, One Health projects under preparation in Kyrgyz Republic and Nigeria). In particular, the World Bank’s ECA Region has begun to address the One Health agenda by funding a One Health team to provide leadership,
support task teams, and facilitate knowledge sharing, including the provision of Bank-wide cross-
support. Good practice case studies are featured in Annex 8.

Making One Health operational among international agencies will entail a similar and to some extent
parallel series of “steps” to those given for individual countries. Among international agencies
however, no ordinal numbers suggesting probably sequence or priority applies.

Creating increased awareness and making the case for One Health by preparing and disseminating economic analyses
of disease impacts and enhancing advocacy mechanisms

This is in effect a direct parallel to step 2 prescribed for individual countries and relates to the
dissemination of practical information about the extremely favorable cost-to-benefit ratios an
effective One Health agenda can deliver. These include its promise to prevent and reduce human
suffering and mortality. This relates to the core ethics of international development agencies, and
awareness of its importance is essential to making One Health an international priority alongside
others such as food security. A useful overview of these benefits is provided in the recent report of
the prestigious Institute of Medicine Sustaining Global Surveillance and Response to Emerging Zoonotic
Diseases.6

Improving collaboration among international technical agencies

Cooperation at the international level is generally good. Despite the noteworthy levels of
cooperation among these international organizations during the HPAI campaign, a number of
impediments also became clear, particularly during the initial phase of the outbreak. Different legal
and financial frameworks, as well as business models and operational procedures, remain hurdles to
fuller collaboration. The international community could aim for the improvement described below.

The first option is to proceed using the model that was established by the GPAI and consisted of a
task force administered by the FAO, OIE, and WHO. Theoretically, this model can be expanded on
a case by-case basis to include other concerned agencies as well, depending on the challenges that
are implicit in responding to a newly emerging or re-emerging highly infectious zoonotic disease.
This represents an ad hoc and reactive orientation to emerging diseases that requires considerable
improvisation on the part of the institutions involved. It is, moreover, based on the assumption that
the HPAI model is more or less directly applicable to all emerging diseases in general.

The second option is to strengthen the existing joint Global Early Warning System by improving
disease surveillance and reporting procedures from within countries. This option could be
strengthened by fully aligning this system with the WHO’s International Health Regulations, with
similar responsibilities, incentives, and penalties, applied to reporting on livestock and wildlife.
Incentives could include linking access to funding of longer-term control operations to the
availability of appropriate contingency plans, which include the improvement of communication
channels, the availability of emergency funds, and the agreement to mandatory early reporting.

6 Available on the Institute of Medicine’s web site at:
The third option is to strengthen the coordinating role of the United Nations System Influenza Coordination (UNSIC), or introduce a similar high-level UN mechanism to facilitate consultation with concerned international organizations such as the FAO, OIE, and WHO, and to expand this consultation to include institutions specializing in wildlife and environmental health and others concerned. This coordinating role is by definition un-intrusive and avoids impinging on the mandates of the organizations and institutions involved, limiting itself to building consensus and to formulating mutually agreed-upon strategies to employ during the early phases of an emerging outbreak. This would imply appropriate and secure funding, and extending UNSIC’s mandate, which is now expected to run out in 2011.

**Identifying sustainable funding systems to support low income countries to cover the investment cost**

Low-income developing countries need financial and technical assistance to strengthen their health systems in the context of the One Health approach. Donor funding for development of animal and human health systems, and how they work together for One Health, is likely to fall short. Weak health systems in developing countries make infectious disease spread more likely, putting not only the health and livelihoods of people in poor countries at risk, but also the whole world (global public good). The international community thus has an interest in establishing a predictable source of adequate funding in the long term (for instance, from a small tax on livestock trade). A Task Force comprising industrialized and developing countries, OIE, WHO, FAO, and the World Bank should be established to develop a resource mobilization mechanism.

Estimated external financing needs for One Health programs to 2020 is an annual average of $1.3 billion ($0.8 billion for least developed countries) - about equal to annual external funding for Avian and Human Influenza programs in 2005-09 ($13 per OECD country citizen for the 12-year period or $1.12 per year per person). Over 12 years the external financing need is $16 billion which is one half of one percent of the impact of a severe flu pandemic. Benefits of this expenditure include:

- Improved health, higher incomes, and reduced poverty, especially among the poor in the poorest countries.
- Improved health, reduced economic costs, and reduced response costs in all countries (e.g., Tamiflu sales in just one year were $2.9 billion).
- Reduction of probability of disease outbreaks, better estimates of this probability, and improved capacity to control outbreaks and mitigate their impact.

**Strengthening research capacity**

Improved international research capacity for the control of zoonotic diseases, one that creates an active interface between medical and veterinary science, is needed. This research agenda needs to underpin efforts to develop and operate an efficient and effective global surveillance system and to anticipate technical challenges to controlling disease outbreaks.
In conclusion, the wide variety of practical actions described in this document are virtually all more readily achievable now than they would have been prior to GPAI experience. We now benefit from the availability of a number of complementary tools such as the OIE’s PVS and the WHO’s IHRs. We have a much better picture of the kinds of financial instruments and regulatory features that make for an enabling environment for routine and systematic coordination between the different agencies responsible for various aspects of disease surveillance and control. We have a much clearer picture of what effective communications strategies look like than we did a decade ago. We know what kind of information is most useful to champions and advocates in persuading governments and international agencies to assign priority and commit resources to disease prevention and control. And we understand the clear and present risk that declining public concern with potential pandemics will lead to reduced political commitment in an atmosphere of limited public resources. Hence our attention to keeping the One Health agenda “alive” and our concern that the progress achieved to date may be lost.
Annex 1: Concept Note

Learning Exchange Event on Avian and Human Pandemic Influenza: The Way Forward

Introduction

A recent review of GPAI revealed that: (i) the projects in the portfolio are complex from both technical (e.g. issues relating to surveillance, compensation, vaccination etc.) and institutional (multisectorality) standpoints; and (ii) the implementation difficulty will likely increase over time as projects are restructured to reflect a shift from emergency response to longer term development.

Limited infrastructure and absorption capacity and, in certain client countries lack of experience of implementing agencies, variously contribute to the implementation challenges, including modest disbursement rates. The crisis and emergency response nature (which was a prerequisite at the time)---as opposed to a broader normative development perspective---of the Program meant that financing needs and therefore disbursement would peak and ebb in tandem with outbreaks and perceived risks in the client countries.

On the other hand, some critical success factors (which are commonly in the domains of response and containment, control and prevention, and preparedness) are influenced by disease surveillance, information transmission mechanisms (from areas of outbreaks to authorities at the center and for mobilization and response) and compensation policies and procedures, among others.

To improve development outcomes, it is generally agreed that there is a need: (i) to broaden the scope of the GPAI projects to move beyond HPAI and get to a system-based approach, reinforce the veterinary and public health services, so as to encompass the eradication and control of a wider array of zoonoses and other diseases, and (ii) to transition to longer-term development even as immediate needs are dealt with. This approach is in line with the proposals espoused at the international conference on avian influenza in New Delhi (2007) and the “One World One Health” strategic framework tabled in Sharm El-Sheikh (2008), and followed up by the Winnipeg conference (2009). This Strategic Framework advances reducing disease risk at the animal-human-ecosystems interface.

To support the efforts of the Task Team Leaders implementing HPAI projects and other operations where animal and human health are integrated, and to aid portfolio performance, a learning event comprising a field trip and learning clinics is proposed:

Objectives

The principal objectives of the proposed learning event are to: (i) facilitate an exchange of technical and operational good practice among the community of World Bank teams engaged in H5N1 or similar operations; (ii) raise awareness of the significance of the emerging One Health agenda and
identify possible adjustments to current operational practice and to begin to define an appropriate role for the World Bank Group in supporting the adoption of One Health; and (iii) develop operational and technical recommendations to inform future World Bank Group work in the One Health activities.

Methodology

ARD and HDN are organizing in collaboration with the Government of Vietnam, the task teams of active selected projects and other resource persons, a learning event comprising a field trip and a set of clinics will be developed based on the HPAI project interventions components which typically include: (i) an animal health component which strengthens veterinary services and enhances HPAI preparedness capability, control and containment strategies (surveillance systems, early detection and rapid response systems, compensation strategies), prevention activities (vaccination strategies) and recovery strategies, (ii) a human health component which enhances public health program planning and coordination, strengthens surveillance systems and health system capacity under the new International Health Regulations, (iii) a public awareness and information component, which improves capacity building, and information and communication, (iv) strengthened institutional arrangements for delivering efficient animal health and public health services (One Health concept).

Clinics on these subjects will be designed and used to supplement the overall learning experience of the field trip. To augment the learning experience further Task Team Leaders will share their own experiences and expertise during the workshop in informal and structured ways. Also, subject matter specialists from WHO, FAO, OIE and UNICEF involved with the One health approach will be invited to participate. The experiences shared in the tour will be documented by the team and compiled into an ARD-HDN knowledge product for use in other learning events.

Format

Clinics will consist of two days of interactive sessions (April 14-15) divided into four modules with short presentations followed by plenary discussions and recommendations. In addition, a series of appendices covering specific standard operating procedures, diagrams, case studies, and other complementary information will be provided. A two-day field visit will be organized in close cooperation with the Government of Vietnam on April 16 and 17, 2010. Particular attention will be given to the following topics:

i. development of adequate national preparedness plans (human and animal health sectors)
ii. development of an effective surveillance system for both human and animal health sectors
iii. identification of good practices for disease control and containment in human and animal sectors
iv. development and implementation of communication and public awareness strategies
v. operational issues and challenges toward a second generation of projects
vi. the emergency of One Heath concept and operational impact
vii. advancing the One Health agenda at the World Bank Group

Output/Outcome

- A wide-range and candid exchange of experience and current practice in the response to H5N1
- An assessment of the strengths and weaknesses of H5N1 operations and the adjustments that could provide better support of the One Health agenda
- Recommendations to inform technical and operational practice in the ongoing H5N1 and similar One Health interventions. As a result, an ARD-HDN knowledge product will be produced.

Task Team Leaders will be better equipped to manage the increasing portfolio and complexity of animal-human-ecosystems health projects.

Time and Venue

The technical session (clinics) of the study tour will be held in Ho Chi Minh City on April 14-15, 2010, and the field visits will take place in Can Tho and Long An Provinces on April 16-17, 2010. Please refer to Annex 2 for the agenda.

Target Audience

- World Bank Task Team Leaders and staff from the Sustainable Development and Human Development Networks and their government counterparts
- Technical Advisers from partner agencies (FAO, WHO, OIE, UNICEF, UNSIC and EC)

Activities and Timeframe

Preparation: September 1, 2009 – March 31, 2010

Learning Exchange event: April 14-17, 2010
Annex 2: Presentation at the 7th International Ministerial Conference on Animal and Pandemic Influenza: The Way Forward on April 19-21 in Hanoi

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<td><strong>Objectives</strong></td>
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<tr>
<td>◦ Exchange experience on technical and operational good practice and lessons learned from H5N1</td>
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<tr>
<td>◦ Consider appropriate role for the World Bank Group in supporting the adoption of One Health</td>
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<tr>
<td>◦ Develop operational and technical recommendations to inform future One Health activities</td>
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<tr>
<td><strong>Agenda</strong></td>
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<tr>
<td>◦ 2-day workshop in HCMC with technical clinics</td>
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<tr>
<td>◦ Field visits to Can Tho and Long An</td>
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<tr>
<td><strong>50+ Participants</strong></td>
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<tr>
<td>◦ Senior animal and human health practitioners from 12 countries (Albania, Armenia, Azerbaijan, Bosnia-Herzegovina, China, Laos, Mongolia, Myanmar, Niger, Nigeria, Turkey and Vietnam)</td>
</tr>
<tr>
<td>◦ WB staff from Africa, Asia, Europe and HQ</td>
</tr>
<tr>
<td>◦ FAO, IFPRI, UNSIC, UNDP, UNICEF and WHO</td>
</tr>
</tbody>
</table>

**Outcomes and Reflections**

- Much has been accomplished under the H5N1 banner since 2006, in 3 key areas:
  - **Results on the ground and capacity built** – H5N1 situation, lab network (e.g. Vietnam), hospital ICUs (e.g. Albania, Uzbekistan), better and timely response to H1N1 pandemic thanks to preparedness plans, communication and public awareness (e.g. Turkey)
  - **Partnerships and collaboration** at global, regional and national levels with rapidly mobilized financing
  - **Experience and knowledge** (e.g. guidelines on biosecurity, compensation, training materials, etc.)

- These outcomes were based on 72 operations in 60 countries, implemented with a large family of partners

**Success Factors → Results**

- Strong government leadership by affected countries
- International support (technical and financial)
- Effective coordination (national level intersectoral and interdisciplinary, and with external partners)
- Moving beyond emergency response to long term strategic planning (national strategic plans, Greenbook VN, India Roadmap, Africa INAPs, GPAI…)
- Improved transparency (sharing samples, clear and timely communications, timely notification of outbreaks)
- Effective disease surveillance and control systems, employing a range of tools (vaccination, culling, transparent compensation programs)

**The emerging “One Health” Agenda**

- Our learning event focused on One Health
- For our immediate purposes, we think One Health means: A framework for enhanced collaboration in areas of common interests (intersections), with initial concentration on zoonotic diseases, that will reduce risk, improve public health globally and support poverty alleviation and economic growth in developing countries
- This concept involves a better way to deal with risks at the animal-human-environment interface

**The One Health Approach**

- In practical terms:
  - Strengthens collaboration in areas of common interests (intersections) across health systems for better effectiveness and shared efficiencies (e.g., integrated information systems, shared communication, labs)
  - Should start with examples of good practice in zoonotic disease control
  - Specifically: training/education, surveillance, research, outbreak investigation and response, etc.
    - Includes alerts systems for emerging high risk diseases and better control of endemics
  - Emphasize communications for behavior change by at risk populations (e.g. animal owners, transport, food processing, etc.)
  - Advocacy to address the political agenda
Result: Stronger animal and human health systems for early detection and rapid response to zoonotic diseases

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<th>The Way Forward (1)</th>
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<tbody>
<tr>
<td>Some countries already apply the principles of One Health, based on recognized needs for better control of other zoonotic diseases</td>
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<tr>
<td>Much has been achieved, but capacity has to be sustained and increased to avoid losing these achievements – these gains are fragile and have been dependent on external support</td>
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<tr>
<td>Each country must determine its own way forward, based on specific needs, capacities and institutional structure</td>
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<th>The Way Forward (2)</th>
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<tr>
<td><strong>A Systemic Approach</strong> to Animal Health (OIE-PVS with follow up gap analysis and strategic plans) &amp; Human Health systems assessments (IHR-based, with strategic plans)</td>
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<tr>
<td><strong>Economic Analysis</strong> of disease impacts for rationale, advocacy and commitment</td>
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<tr>
<td><strong>Post-Secondary Education</strong> (Human resources: key constraint at the country level)</td>
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<tr>
<td><strong>Support in-country champions</strong> to achieve above actions, advocate for budget allocations, and strengthen institutional mechanisms and coordination processes</td>
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<tr>
<td>External <strong>financing and technical support</strong></td>
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<tr>
<th>Financing</th>
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<tbody>
<tr>
<td>Donor funding for development of animal and human health systems, and how they work together for One Health, is likely to fall short of needs.</td>
</tr>
<tr>
<td>Weak health systems in developing countries make infectious disease spread more likely, putting at risk not only the health and livelihoods of people in poor countries, but also the whole world (Global Public Good).</td>
</tr>
<tr>
<td>The international community thus has an interest in establishing a predictable source of adequate funding in the long term (for instance, from a small tax on livestock trade).</td>
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<tr>
<td>A Task Force comprising developed and developing countries, OIE, WHO, FAO and the World Bank should be urgently established to develop a resource mobilization mechanism.</td>
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</table>
# Annex 3: List of Participants

<table>
<thead>
<tr>
<th>Last name</th>
<th>First Name</th>
<th>Title</th>
<th>Agency</th>
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**Additional Counterparts and Invitees**
## Annex 4: Agenda

**Towards One Health: New Approaches to Managing Zoonotic Diseases**

Ho Chi Minh City, Long An and Can Tho, Vietnam, April 14-17, 2010

### REGISTRATION: SOFITEL HOTEL - TUESDAY, APRIL 13, 2010

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<tr>
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### TECHNICAL CLINICS: APRIL 14-15, 2010

**DAY ONE: Wednesday, April 14, 2010**

**Facilitator:** Phillip Hay, Communications Adviser, HDNOP

**Rapporteur:** Laurent Msellati, Operations Adviser, EAPCO

<table>
<thead>
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<tr>
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<td>Introduction: Hoonae Kim, Sector Manager, EASVS</td>
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<tr>
<td>09:00 - 10:30</td>
<td>Clinic 1: Controlling H5N1 at Source: The Red Book, the Green Book and Future Approaches to Integrated Disease Management in Vietnam. Vietnam was one of the first countries to be severely affected by H5N1. This experience and the integrated government response set out in the Red and Green Books continues to inform practice on disease control and vaccination throughout East Asia and beyond.</td>
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<tr>
<td>09:00-09:30:</td>
<td>Presentation: Government of Vietnam Dr. Hoang Van Nam, MARD</td>
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<tr>
<td>09:30-10:45:</td>
<td>Plenary Discussion: led by Laurent Msellati, Operations Adviser, EAPCO</td>
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<tr>
<td>10:45-11:00:</td>
<td>Coffee Break</td>
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<tr>
<td>11:00 - 12:30</td>
<td>Identifying the key success factors in H5N1 Response. This session will explore key success factors in the response to H5N1, and in particular the importance of government leadership, consistent and integrated communication and discuss the extent to which the mechanisms and approaches mobilized in response to H5N1 can be sustained and reshaped to respond to future disease threats.</td>
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<tr>
<td>11:00-11:15:</td>
<td>Presentation: Olga B. Jonas, Economic Adviser, HDNVP - Evidence of success to date.</td>
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<tr>
<td>11:15-12:15:</td>
<td>Key perspectives from Alive-coordinated INAPs, FAO, OIE, WHO, UNICEF</td>
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<tr>
<td>12:15-12:45:</td>
<td>Plenary Discussions: led by Phillip Hay, Communications Adviser, HDNOP</td>
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<tr>
<td>12:45 – 14:00</td>
<td>Lunch</td>
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<tr>
<td>14:00 – 16:30</td>
<td>Clinic 2: The Challenge of Achieving Pandemic Preparedness. Despite notable success in controlling avian influenza and limiting human infection, the emergence of A (H1N1) underscores the need to help countries prepare to respond to a human influenza pandemic. This session will present a series of country experiences and encourage an exchange focusing on the measures taken to strengthen systemic collaboration between animal and public health agencies. Effective communications at all levels need to be strengthened in order to better support decision-making, to enable effective response at the community level, including through behavior changes.</td>
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<tr>
<td>14:30-14:45:</td>
<td>3 Presentations by task teams in Africa, Eastern Europe and Central</td>
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<tr>
<td>Time</td>
<td>Session Description</td>
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<tr>
<td>09:00-10:30</td>
<td><strong>Clinics 3: The Emerging One Health Agenda.</strong> Since the emergence of the “One Health” agenda, many development partners are institutionalizing this approach establishing joint units, adopting integrated approaches and providing technical and financial support to develop and sustain closer work between animal and public health agencies. This session will explore current experience touching on initial World Bank Group efforts to organize on these principles.</td>
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<tr>
<td>09:00 - 09:15</td>
<td>Presentation: Jimmy Smith, Senior Livestock Specialist, ARD</td>
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<tr>
<td>09:15 - 10:15</td>
<td>Plenary Discussions: led by Phillip Hay, Communications Adviser, HDNOP</td>
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<tr>
<td>10:15 – 10:30</td>
<td>Coffee Break</td>
</tr>
<tr>
<td>10:30 – 12:45</td>
<td><strong>Operational Issues &amp; Challenges – Towards a Second Generation of Projects.</strong> Evaluations of the response confirm that while overwhelmingly successful, the multidimensional and highly collaborative nature of AHI projects make them work-intensive and technically demanding as teams try to balance short-term and systemic needs. This session will discuss the evolution of World Bank operations from initial response activities to addressing on a more-medium term agenda, focusing on experience in South Asia, Africa and Eastern Europe and Central Asia.</td>
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<tr>
<td>10:30 – 10:45</td>
<td>Presentation: ECA team</td>
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<tr>
<td>10:45 – 12:30</td>
<td>Plenary Discussion</td>
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<tr>
<td>12:30 - 14:00</td>
<td>Lunch</td>
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<tr>
<td>14:30-15:00</td>
<td><strong>Clinic 4: The World Bank Group and the Future of One Health.</strong> This forward looking session will discuss the roles for the World Bank Group in advancing and supporting the One Health Agenda. Recent experience in response to H5N1, H1N1, the food, fuel and Global Financial crises has illustrated the contribution that the World Bank Group can make when operating in collaboration with technical and other development partners. As developed and developing countries ponder the prospects for committing to the One Health agenda in highly constrained financial circumstances, participants will examine possible supportive and leadership roles for the World Bank Group – and the instruments and resources needed to fulfill them.</td>
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<tr>
<td>14:00 – 14:15</td>
<td>Compensation by Amy Evans, Consultant</td>
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<td>14:15 – 14:30</td>
<td>Economic studies for zoonoses by Clare Narrod-IFPRI</td>
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<tr>
<td>14:30 – 15:00</td>
<td>Plenary Discussions led by Phillip Hay, Communications Adviser, HDNOP</td>
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</table>
**Concluding Remarks:** Laurent Msellati, Operations Adviser, EAPCO

**Closing Discussion and Next Steps.** Reviewing the previous discussions, participants will identify issues requiring greater discussion and suggest recommendations to inform the ongoing work program.

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
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</thead>
<tbody>
<tr>
<td>15:00</td>
<td>Departure for Can Tho</td>
</tr>
<tr>
<td></td>
<td>Overnight in Can Tho – Hotel Victoria</td>
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</tbody>
</table>

**FIELD VISITS: APRIL 16 - 17, TIEN GIANG AND LONG AN PROVINCES**

**DAY THREE: Friday, April 16, 2010**

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
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<tbody>
<tr>
<td>6:30</td>
<td>Short visit to the floating market</td>
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<tr>
<td>9:00</td>
<td>Visit Can Tho Laboratory</td>
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<tr>
<td>11:00</td>
<td>Discussions</td>
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<tr>
<td>12:30</td>
<td>Lunch</td>
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<tr>
<td>15:00</td>
<td>Leave for Long An</td>
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<td></td>
<td>Overnight in Long An</td>
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</table>

**DAY FOUR: Saturday, April 17, 2010**

<table>
<thead>
<tr>
<th>Time</th>
<th>Activity</th>
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<tbody>
<tr>
<td>8:00</td>
<td>Simulation exercises</td>
</tr>
<tr>
<td>11:30</td>
<td>Lunch and discussions</td>
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<tr>
<td>14:00</td>
<td>Visit of a small holder farm</td>
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<tr>
<td>15:30</td>
<td>Visit a slaughterhouse or a hospital</td>
</tr>
<tr>
<td>17:30</td>
<td>Departure for Ho Chi Minh City</td>
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</tbody>
</table>
Annex 5: Global Program for Avian Influenza Control and Human Pandemic Preparedness and Response (GPAI) and Avian and Human Influenza Facility (AHIF)

The World Bank has two main mechanisms to help its client countries deal with avian influenza and other zoonotic diseases in animals and to prepare for and respond to a possible human flu pandemic. The first of these is a global funding program, formally known as the GPAI. The second mechanism were trust funds of the multidonor Avian and Human Influenza Facility (AHIF), which channeled a part of the funds pledged by donors at the Beijing Conference on avian influenza in January 2006 and the Bamako pledging conference in December 2006. Donors, including the World Bank, channeled their support through the multidonor flexible financing framework (and not through a special fund). The framework was designed to focus on coordination of donor activities and contributions, while allowing flexibility for donors to provide support under various terms (grants, loans, credits) and to channel the funds in various ways as per their preferences. The framework was also set out to be flexible enough to address funding needs as they emerge and to be adaptable and sustainable over the longer term to support countries in priority activities that will take more time to implement. In 2005-2009, $4.3 billion were pledged by 36 donors to support AHI programs in developing countries. Assistance from bilateral donors, $ 2.6 billion, was nearly all disbursed by end-2009 since it was mainly to UN and other international organizations, as well as in-kind emergency assistance to countries. Support from multilateral development banks was mainly to countries and disbursed more slowly since it mainly financed medium-term programs of capacity-strengthening. All developing countries were eligible to receive financing under the GPAI, which allowed for the use of up to US$1 billion in loans from the IBRD, and in credits or grants from the World Bank's concessional lending arm, the IDA. The Bank's Board of Executive Directors endorsed the program in January 2006 and extended it in June 2009 to June 30, 2010. It was an Adaptable Program Loan (APL) that could be applied across countries as needed. It drew on an integrated approach developed in conjunction with FAO, OIE, and WHO. Countries could access funding to strengthen their veterinarian and health services to deal with avian influenza outbreaks among animals, minimize the threat to people, and prepare for, and respond to, any potential human flu pandemic. The Bank processed these operations using its emergency procedures stated in OP/BP 8.00, Rapid Response to Crises and Emergencies which allowed quick preparation and approval. Program components are indicated below and additional program details can be found in the Program Framework Document. To help countries prepare projects for financing, Bank task teams also provided a range of analytic and advisory assistance.

I. Animal Health Component

The program supports national prevention and control strategies proposed by individual countries to cover their needs in the short, medium or long terms. Individual country projects are based on detailed assessments of the avian influenza epidemiological status of the capacity of National Veterinary Services to cope with HPAI epidemic and the vulnerability of the poultry industry to new
emerging infectious diseases. Individual country projects support four areas of activities described below:

A. Enhancing HPAI prevention and preparedness capability for countries at-risk:
   
   A1. Adapting National Policy Framework: (a) evaluation of National Veterinary Services; and (b) review of National Compensation Policy
   
   A2. Improving HPAI prevention and control planning: (a) preparation of National Emergency Contingency Plan for HPAI and (b) attendance to national and international conferences

B. Strengthening of veterinary services, disease surveillance, diagnostic capacity and applied research for HPAI disease-free and infected countries.

C. Strengthening HPAI control programs and outbreak containment plans, for countries in pandemic situation and newly infected countries:
   
   C1. Targeting virus elimination at the source
   
   C2. Supporting vaccination campaigns
   
   C3. Human safety component

D. Improving bio-security in poultry production and trade, with the longer term vision of restructuring the poultry industry.

II. Human Health Component

In the public health field, short-and long-term actions need to be taken and an appropriate balance struck between the two. Immediate action is needed in a number of areas, but there is also a longer-term agenda given systemic shortcomings with respect to core public health functions.

A. Enhancing Public Health Program Planning and Coordination

B. Strengthening of National Public Health Surveillance Systems

C. Strengthening Health System Response Capacity

III. Public Awareness and Information Component

A. Capacity Building

B. Information and Communication Services

IV. Implementation Support and Monitoring and Evaluation Component

A. Project Management
B. Monitoring and Evaluation

The World Bank is collaborating in the GPAI with three technical UN agencies: the FAO as the first-responder agency to address control, and containment; the WHO as the second responder to develop pandemic preparedness; and the UNICEF, to promote communications and public awareness. The OIE is also an important international partner in the areas of veterinary regulatory guidelines, disease reporting, and veterinary capacity assessment.

The global APL instrument, by complementing activities supported by other international organizations and donor agencies, ensured the availability of adequate resources to fund priority investments and technical assistance for the rapid scaling-up of individual countries’ responses in a flexible manner—when individual countries have met the eligibility criteria and when individual projects are ready to receive Bank support.

Decisions to proceed with country loans/credits/grants were based on degree of readiness of the countries and their ability to meet the funding eligibility criteria. In accordance with the procedures for horizontal APLs, for each "follow-on" loan/credit/grant, the Project Appraisal Document (PAD) (or Technical Annex in lieu of the PAD) was circulated to the Board after approval of the loan/credit/grant by Bank Management. In the absence of requests from three or more Executive Directors for Board consideration of the loan/credit/grant, World Bank Management approval became effective ten working days after circulation of the documents to the Board.

While the APL was the main vehicle for providing Bank support to its borrower countries to address and contain the avian influenza, the World Bank supplemented the response under the APL with other measures. These included: (i) restructuring existing projects in relevant sectors (primarily health and agriculture) to add components to address avian influenza through reallocation of outstanding balances and/or additional financing; and (ii) canceling outstanding balances under certain projects and, channeling equivalent funds into an operation that would address the avian influenza either under the APL program or a restructured project. The Bank was also ready to provide supplemental Development Policy Loan (DPL) financing in countries with ongoing DPLs where the situation merits such support, but there was no demand for this option.

The financing framework used available sources of external funding to help finance an integrated country program. This framework assumed that: (i) existing resources (from government and the domestic private sector, and from external donors) would be reprioritized as far as possible, and that (ii) all donors would contribute to a single program, avoiding pursuit of separate approaches that might overlap or contradict each other. The World Bank has been a channel for financing at country level, both using its own resources—in particular via the APL—and through any available World Bank-administered trust funds.

GPAI has, after a significant emergency support to control the HPAI epizootic and to prepare for a possible pandemic, gradually shifted towards longer term institutional strengthening, including the development of INAPs that align with common objectives within and across countries.
Annex 6: Controlling H5N1 at the Source in Vietnam—the Red Book and the Green Book

The integrated Government response to H5N1 is set out in the Red and Green Books, which continue to inform practice on disease control and vaccination throughout East Asia and beyond.


Objectives of the Integrated Action Plan

Common Objective

The overarching objective of the Integrated National Plan (the Plan) is to reduce the health risk to humans from avian influenza by controlling avian influenza at source in domestic poultry, by early detecting and responding to human cases, and by preparing for the medical consequences of a human pandemic if it occurs over the next three years.

Objectives for the Agriculture Sector

For the animal health sector, the overall goal is to progressively control and eradicate HPAI from poultry in Vietnam. The specific short to medium term objectives are:

1. To contain the disease and minimize the occurrence of new outbreaks;
2. To strengthen the capacity of national veterinary services to early detect, diagnose and respond to new outbreaks; and
3. To minimize losses for the poultry sector, especially for poor backyard poultry farmers. Over the longer term, Vietnam’s objective is to restructure its poultry industry by improving bio-security and food safety along the value chain from the producer to the consumer, while protecting the livelihoods of poor farmers and preserving the environment.

Objectives for the Health Sector

The specific objectives for the health sector’s response to HPAI are:

1. To minimize the incidence of, and mortality caused by, sporadic avian influenza infections in humans;
2. To reduce the risk of an influenza pandemic occurring; and
3. To take steps that will reduce the impact of a possible influenza pandemic.

The principle underlying the health sector’s response is to link activities targeting HPAI to a broader agenda of strengthening the capacity of the sector to detect, control, and respond to emerging infectious diseases, especially zoonoses. However, the Plan does not include measures to respond to
a pandemic in case this scenario happens and consequently the contingency costs associated with this scenario have not been included.

Integrated National Operational Programme for Avian and Human Influenza (OPI) 2006 – 2010 (Green Book)

The Green Book identifies and outlines activities envisaged by the Government to achieve the objectives and outputs identified in the Integrated National Plan for Avian Influenza Control and Human Pandemic Influenza Preparedness and Response (Red Book). It also includes: (a) a range of health sector activities relevant to influenza pandemic preparedness but ranked as second-level priority by the Ministry of Health; and (b) activities aimed at supporting the restructuring of the poultry sector in line with the “commercialization” strategy proposed by the Department of Livestock Production (DLP) of the Ministry of Agriculture and Rural Development but that place emphasis on preserving poultry farmers’ livelihoods and minimizing environmental externalities.

The general purposes of the OPI are:

- To identify activities envisaged by MARD, MoH and other agencies to develop a framework for enhancing the existing integrated approach to HPAI control and pandemic preparedness over a five-year period (2006-2010);
- To provide a framework for resource mobilization within an integrated strategy developed by the Government and endorsed by international partners; and
- To provide a framework for coordination and collaboration between the Government of Vietnam and international partners in the fight against HPAI.

Objectives of the OPI

The overarching objective of the OPI is to reduce the health risk to humans from avian influenza by controlling the disease at the source in domestic poultry, by early detection and response to human cases, and by preparing for the medical consequences of a human pandemic if one were to occur during the next five years.

Agriculture Sector

For the animal health sector, the overall goal is to progressively control and eradicate HPAI from poultry in Vietnam. The specific short- to medium-term objectives are:

- To strengthen veterinary services in order to control HPAI and other potential zoonotic disease threats;
- To control HPAI using a cost-effective phased approach that addresses each sector; and
- To plan poultry sector restructuring to enables better control of HPAI while minimizing the loss of livelihoods and environmental pollution.
Health Sector

The specific objectives for the human health sector's response to HPAI are:

- To minimize the incidence of, and mortality from, avian influenza;
- To reduce the risk of an influenza pandemic occurring; and
- To take steps to reduce the impact of a possible influenza pandemic.

The principle underlying the health sector's response is to link activities targeting HPAI to a broader agenda of strengthening the capacity of the sector to detect, control, and respond to emerging infectious diseases, especially zoonoses.

Annex 7: The Africa Livestock Partnership

Stephane Forman and Veronica Schreiber of the World Bank’s Africa Region gave a presentation on the achievements of ALive-Coordinated Integrated National Action Plans and the factors that contributed to their success.

In fiscal year 2007 ALive, whose Secretariat was hosted for the first three years by the World Bank (it is now based at AU-IBAR), obtained a multidonor trust fund grant (MDTF) equivalent to around US$7.5 million to support SSA client countries’ AHI activities. While the AHIF allocation of US$9.0 million for the Africa Region has been depleted, the MDTF has become the source of parallel funding for the Region’s AHI activities. ALive’s MDTF is strictly dedicated to funding pre-operational activities, i.e., RAs and development of INAPs.

As of October 2009, rapid assessments had been undertaken in 26 SSA countries to evaluate their preparedness for avian and human influenza and to identify what was required to strengthen their response plans. The assessments were conducted by multidisciplinary teams from FAO, OIE, the AU-IBAR, and the WHO’s Regional Office for Africa and consisted of specialists in animal health, human health, communications, and finance. The results of the assessments were used as the bases for INAPs, most of which were then endorsed by their respective national governments. Several of the INAPs were used as input into externally supported projects to enhance influenza preparedness. These projects, such as the World Bank-funded Uganda Avian and Human Influenza Preparedness and Response Project provided a balanced distribution of responsibilities and resources.

Among the principal challenges encountered when preparing the action plans were the high transaction costs of assembling multidisciplinary teams with members from multiple institutions, and the need to adapt interventions to the needs of individual countries. While the ALive initiative is widely considered a unique experience in intersectoral cooperation, the INAPs themselves still need to be tested through simulation exercises, such as have been conducted by countries in other developing regions.

An inter-agency coordination for implementing a strategy to address AHI at the African level is a good example of a pre-operational One Health framework.

Alive-coordinated INAPs success factors include:

1. Institutional Collaboration

An umbrella regional partnership, ALive includes most of the major international, regional and national stakeholders of the livestock sector (Regional Economic Commissions, technical organizations, donors, research institutes, etc.). A consensus was reached among members about ALive’s coordination of the INAP project, and a resolution taken subsequently by the Executive Committee. A “quality assurance” process validates the INAPs before they are sent to countries for endorsement. Coordination with upstream and downstream emergency funds was another factor.
2. Coordination and Management

A small and highly dedicated team that maintained open lines communication with champions in each partner organizations was in place. On the World Bank’s side ALive’s Program Manager and the Leader of the World Bank Africa operational task force for AHI was the same person.

3. With Clients and Beneficiaries

Political will to fight HPAI was common in all governments. There was a clear definition of responsibilities between partner institutions and recipients/client countries during assessment missions. Ownership to countries was transferred early; countries become responsible for INAP implementation. OIE PVS missions have been already undertaken in most of the countries receiving AHI rapid assessments (23 out of 26).
Annex 8: Eastern Europe and Central Asia Region Case Studies

The ECA portfolio of 13 avian influenza projects has provided the following four case studies highlighting some of the more significant achievements of the projects. These case studies are important not only to demonstrate the advances in the respective countries’ capacity to control and respond to avian influenza outbreaks, but also to provide building blocks for addressing other zoonotic diseases in line with the One Health approach. The material presented in this Annex was received after the Learning Exchange but is provided owing to its relevance.

- The Albania case study focuses on that country’s successful experience in establishing a team of professional veterinary epidemiologists within the Ministry of Agriculture.

- The Azerbaijan note provides a good example of a very fruitful outbreak control simulation exercise, which contributed to important modifications to that country’s Avian Influenza Preparedness Plan.

- In Moldova, the AIHP project supported the first phase of an integrated epidemiological surveillance data platform for human and animal infectious diseases.

- The project in Turkey provides an overview of the inter-related strategic communications and poultry sector biosecurity improvement efforts, supported by USAID and FAO as well as Bank financing.

Albania: Establishment of a National Veterinary Epidemiology Unit

Albania covers almost 29 thousands square kilometers and has 3.3 million inhabitants, half of them living in rural areas. The poultry population is about 6.4 million, of which in 2006 over 85% were on small household farms. Within the Albanian territory there are 5 wetlands in the coastal areas (about 100,000 ha of Ramsar Convention wetlands), three lakes and 640 irrigation reservoirs. Albania is an important crossroads for migratory birds, thus the environment remains very favorable for avian influenza. Albania experienced two outbreaks of avian influenza in backyard poultry in early 2006. Funding from the World Bank GPAI was provided for an avian influenza project in 2006.

Drawing on the Task Team Leader’s past experience as a practicing veterinarian in Albania and knowledge about the epidemiology of the main zoonotic diseases in the country, the project design was able to support the introduction of specialized epidemiologists for the first time in the history of the veterinary service. The 2006 outbreaks of avian influenza and the emergency situation presented a window of opportunity to introduce the Epidemiologist team in the Albanian Veterinary Service. A National Veterinary Epidemiological Unit (NVEU) was established with four veterinarians and a database specialist working at the Central Administration Level, and 12 field veterinarians, one for each Regional Directorate. The veterinarians were selected competitively based on criteria of professional good performance, basic understanding of epidemiological principles, practices and
procedures, knowledge of the vet law and regulations, and practical skills (foreign languages, computer skills, etc.).

The NVEU was financed by the Avian Influenza Project for the first two years, and since January 2008 has been paid by the state budget under MoAFCP. The government has also provided training for NVEU staff. An international veterinary epidemiologist has been recruited to train and advise the NVEU on epidemiology and animal diseases surveillance.

The results of the NVEU team are promising. They focused first on avian influenza priorities, including:

- Census of poultry and survey of related industry for both commercial and back-yard flocks;
- Planning and implementation of a pilot study aimed at improving the poultry sector management;
- Identification of areas-at-risk, habitats of wild- and water-fowl and study of migration temporal and spatial patterns and routes;
- Participation in passive surveillance and designing and implementation of statistically sound active epidemio-surveillance, using as a guideline the relevant EU standards and practices;
- Reviewed and, where needed, updated the Contingency Plan for combating AI, taking into account EU requirements laid down in Council Directive 2005/94/EC;
- Strengthened the liaison with and flow of information to/from the NVEU and the veterinary inspectors and the private practitioners, etc.

Although carried on under difficult situations, these activities demonstrated the relevance and potential of the NVEU, which should be further developed.

The Project initially addressed H5N1 and Influenza-like Illness as the top priority. As soon as the updated emergency plans were in place, simulation exercises carried out and stocks of anti-viral, personal protective equipment, disinfectants and vaccines (seasonal human influenza vaccines) in place, the Government felt comfortable with the level of preparedness for avian influenza and shifted the Project’s attention to monitoring and control of other zoonotic diseases.

From 2006 to 2009 the NVEU created a good animal and poultry database for all the regions of Albania. The database covers the epidemiological situation for 13 diseases including the most important ones for Albania such as anthrax, tuberculosis, brucellosis, classical swine fever, Newcastle disease etc. The database has information on the outbreak points, investigation, culling, vaccinations, etc.

Albania is facing problems with brucellosis infection in both, animals and humans. The public health implication of the existing cases of human brucellosis should be considered the driving force for the implementation of the animal brucellosis control program. Albania has applied to join the EU, and
aims at the harmonization of national animal health programs. The Albanian animal health program requires major modifications and adjustments to satisfy the EU requirements. The Brucellosis control program, including its animal identification system, is one of the main activities that can be used to satisfy these requirements.

Due to the good results of the Avian Influenza Project, the MoAFCP has assigned a brucellosis specialist from the NVEU to oversee the national brucellosis program. This individual will be also responsible to coordinate the brucellosis program with other government sectors such as Ministry of Health, international agencies, and private sector. Although this demonstrates the confidence placed in the NVEU, this individual should be trained soon in pathology, diagnosis, and epidemiology of brucellosis.

Although the Project paid due attention to the NVEU staff training, this was an emergency project and veterinarians cannot become good epidemiologists unless there continuity in their training program. Longer term training opportunities (one year +) are needed for the NVEU central staff. The country has to combat other zoonoses, and the epidemiologists should be well trained.

There are other good results that the Avian Influenza Project has achieved so far, such as closer cooperation between human and animal health service epidemiologists. The project is a good example cross sector cooperation, bringing together experts of different ministries such as agriculture, health, interior, environment, education, and the media. The project has further strengthened cooperation of the Government of Albania with important donors and international institutions such as the WB, WHO, UNDP, UNICEF, OIE, FAO etc. Other very good examples of achievements include rehabilitation of the Virology Laboratories at the Institute of Public Health to BSL2 level and with new diagnostic laboratory equipment, supply of RT-PCR and of adequate training of the laboratory staff, rehabilitation and equipping of the Intensive Care Unit at the Central Infective Hospital. However, the establishment of the NVEU as a team of dedicated and trained epidemiologists under the Project introduced an innovative and needed capacity for animal disease control in Albania.

Azerbaijan Avian Influenza Preparedness Project

Note on a Field Simulation Exercise

During February 2006, several outbreaks of HPAI were confirmed in Azerbaijan. Although the Government reacted swiftly to prevent further spread of the disease and human fatalities, the response had not been so highly organized. The Government realized that they should be prepared for any future such outbreaks with a well-established system of prevention and response.

The World Bank contributed by rapidly restructuring another Azerbaijan project into the Avian Influenza Preparedness Project (AIPP), which was a unique and flexible program aimed, in particular, at enhancing preparedness, prevention and response capabilities. The avian influenza field simulation exercise supported by the project was one of the activities aimed at improving national contingency planning and coordination.
The field simulation was designed to put into practice and test Azerbaijan’s National Avian Influenza Action Plan, which had been previously reviewed by all stakeholders during the national desktop simulation exercise. The field simulation provided the various agencies with the opportunity to test their operational practices and overall readiness for HPAI response. It was designed to test communication between organizations, media response, crowd and vehicle controls, and the ability to detect avian influenza on site using the Mobile Operations Response Unit. Further, the field simulation provided the participants with the opportunity to have hands-on practice and gain valuable experience needed to safely respond to an outbreak.

In total there were about 100 participants in the exercise, representing 22 ministries and agencies as well as the Mobile Operations Response Unit and media. Prior to the simulation, a one-day training was provided on how to organize the response, establish the chain of command, and prepare each agency to conduct activities based on the scenario. Response teams were assigned, equipment, facilities, and materials delivered, and staging and changing areas reserved and set up – everything was in place and ready to conduct the largest HPAI Response Field Simulation exercise in the country. The simulation included all of the activities related to control of an outbreak, including the use of the personal protective equipment, establishment of checkpoints and disinfection points, effective communication and outreach, culling of birds, and disposal of carcasses by incineration, as well as decontamination. The site managers executed and coordinated the response, using global best practice.

This simulation provided the participants with a real test of the operational aspects of the National Avian Influenza Action Plan, and it was deemed to be very successful. It showed that the Plan could be operationalized and acted on locally, which is the key to response and control. It demonstrated that the Plan and its execution can be used to control the spread of the disease. The teams were able to provide support and training to each other, thus accomplishing the tasks without the intervention of the trainer. All of the teams were able to complete their tasks, including on site diagnostics by the Mobile Operations Response Unit. Most importantly, the leadership and responders were able to adapt international best practices to the needs of Azerbaijan.

Overall, this was a highly successful simulation exercise. One of the key metrics was to see that the participants not only demonstrated the activities, but more importantly that they were able to train others. It means that operationally the participants understood the activities and why certain activities were occurring, and could then communicate this to others. This simulation was developed and designed so that the State Veterinary Services could replicate it and conduct similar exercises independently and as needed.

The program included also a debriefing after the exercise to capture key learning. Results have been analyzed and the National Avian Influenza Action Plan has been further refined and submitted to the State Avian Influenza Commission for approval. Today Azerbaijan not only has a plan for action, but, more importantly, has field tested it and ensured the country’s readiness to respond to any future outbreaks of avian influenza or other animal diseases.
Republic of Moldova: Avian Influenza Control and Human Pandemic Preparedness and Response (AIHP) Project

Improving Epidemiological Surveillance with IT Systems

In order to minimize the threat to humans from HPAI, as well as other infectious diseases and zoonoses, the project focused on bringing about improvements to the existing epidemiological surveillance systems. While such systems were in place and functional before the project, they were not sufficiently efficient at providing full and just-in-time snapshots to human and animal health decision makers. This was primarily due to very slow information flows, as national level data on human health was being updated once per month. In addition, at the beginning of the project such data processing did not include information on avian influenza and other zoonoses. Finally, there was virtually no integration and cross-referencing between human health and animal health epidemiological surveillance systems. As a matter of principle, a decision was made early on to strengthen and build upon the systems that existed at the beginning of the project, as opposed to building a parallel system that would focus only on avian influenza. This decision was inspired by practical considerations, but also a larger strategic objective of using the project as an opportunity for really pushing the agenda on disease surveillance in order to move away from mere separate ex-post reporting systems to an integrated epidemiological early warning system. While this ambitious target will not be fully achieved during the lifetime of the project, its activities have built a solid modular foundation, both from a hardware and software architecture point of view, to give the country a real chance in achieving it reasonably soon.

The system was built around the following long-term performance targets and capabilities:

- Daily updating/reporting, preferably with on-line data entry;
- Data entry at the point of data creation (primary health care facilities, hospitals, laboratories, veterinary offices, etc.);
- Functional integration of the human health and animal health surveillance systems;
- Detection and reporting of both suspected and confirmed cases;
- Capability for additionality, i.e. gradual and phased introduction of data sources;
- Flexibility of data sets, i.e., ability to add fields for additional diseases, locations, etc., without changes to software architecture;
- Flexibility in report generation by content, format, medium and geographical attributes;
- Capability for generating decision support reports, i.e. flexible ad hoc reports based on any combination of data from the human and the animal health surveillance databases.
The conceptual architecture of the system is based on the following principles:

- A centralized database is physically placed in the National Center for Preventive Medicine (NCPM), the country’s main epidemiological authority for human health. The system architecture provides for data input from any point that has access to internet. As a contingency option, the system also allows for other types of data input such as transfer of paper form and subsequent data entry at the NCPM;
- Standard reporting is based on uniformity principles – the possibility to retrieve reports from any computer connected to the internet (with appropriate security features);
- The system is integrated with the animal health surveillance system, through access and cross-reference capabilities with the country’s Animal Registration System (SITA) Project and its veterinary computer system;
- In addition to these two separate subsystems, the overall system aims to have a decision support module that can use both databases in order to create consolidated reports that provide decision making support for epidemiological monitoring and response in the country.

The implementation of the system was phased into two stages. During the first phase, the project supported the overall system design and construction, and up- and down-stream implementation in a number of key central and local institutions. During the second stage, the project will commence support to rolling out the system to a larger number of locations and facilities that are computerized and have access to internet. The second stage is expected to last beyond the lifetime of the project. The expectation is that overall computerization and connectivity in the country’s human and animal health facilities will increase dramatically over the next two-three years, thus extending the system both in depth and breadth even without the project’s support.

Three years into the implementation of the project, the first phase is virtually complete. The overall system development is progressing satisfactorily, albeit not without some understandable hardships. The software is now fully functional, following a test launch in September, 2009. More than 100 locations are fully equipped and connected to internet, and using the system. The central location at the NCPM and facilities at SITA are also fully equipped, connected and functional. Testing and early assessments indicate that the software is well designed and that the overall system is functional and its sub-systems on human and animal health are well integrated, with data exchange occurring in both directions. The SITA system can now directly access the data on selected human infectious diseases, and the human infectious diseases surveillance system managed by NCPM can access the SITA database. This provides accurate and timely reporting on both human and animal disease data and thereby facilitates well-informed decision making. Currently the system is already used in daily business processes, although some further system stabilization measures are being implemented to achieve full and unhindered functionality.
The system is ready to move towards the second phase of development, and the project will provide further support for its strengthening and extension, until the project closing in March, 2011. In this second phase the project will primarily support the following activities: (i) further up- and downstream integration of the system into the public health system, i.e. additional entrants; (ii) public health business process reengineering; (iii) development of additional system features; and (iv) training of medical and veterinary personnel in system usability and applicability.

Indeed, there are still many remaining challenges before one can safely conclude that the country has fully achieved the modernization of its epidemiological surveillance system. Nonetheless, the progress that was achieved by the country’s human and animal health authorities, with the support of the Avian Influenza Control and Human Pandemic Preparedness and Response Project is impressive, and sets the stage for a successful completion of this effort in the future. The country now has a solid foundation to build upon – a functioning hardware and software architecture; system versatility and flexibility to allow expansion and growth; and integration of human and veterinary surveillance systems. But more importantly there is a growing understanding of the value of this product for an effective use in public health planning and decision making, and a desire to bring about further changes in business processes in epidemiological surveillance.

*Turkey: Avian Influenza Control and Human Pandemic Preparedness and Response (AIHP) Project*

**Communications and Poultry Sector Biosecurity**

In 2005, the first avian influenza outbreak occurred in Turkey. Although it was stamped out in a very short time, it highlighted the absence of preparedness, and triggered preparation of an AIHP project funded by the World Bank, EU, USAID and the Turkish Government. Following the GPAI model, the project was built on three components: (i) Animal Health, (ii) Human Health, and (iii) Communications. This note highlights the project’s activities to support the related efforts towards improved communications and poultry biosecurity.

In early 2006, a wide spread avian influenza outbreak occurred across the whole country, sadly with several cases of human infection and fatalities. During the outbreak, media reports were highly sensationalistic and full of inaccurate information, contributing to widespread panic. The poultry meat sector suffered huge losses, and all efforts to calm the situation were to no avail. Although the outbreak hit all sectors, the backyard and small commercial units were heavily impacted, with all human cases linked to backyard poultry keeping.

**Communications**

Turkey made a choice to focus on using the positive power of communications to improve information flow and highlight political decisiveness through a well-designed strategy. The first step was taken with the establishment of a functional inter-ministerial Strategic Communications Working Group (SCWG) that includes Ministry of Agriculture and Rural Affairs (MARA), Ministry of Health (MoH), Ministry of Environment and Forestry, NGOs, Trade Associations and International Organizations (WB, UNICEF, USAID), and other institutions represented in the
National Zoonotic Disease Committee. The working group focused on (i) development of a multi-stakeholder Communication Strategy for Avian Influenza, and (ii) in parallel, undertaking urgent awareness raising campaigns. A KAP survey was quickly conducted by UNICEF in coordination with Government. The findings of the KAP survey were integrated to the communication strategy. The communications strategy and design of the project overall were also helpfully informed by a rapid “Assessment of Avian Influenza Impact on Backyard Poultry in Turkey” prepared in March 2006 with the support of FAO.

The SCWG developed a Communication Strategy, based on the KAP survey outputs, the rapid assessment, and other data. The strategy focused on designing and producing communications materials (printed materials, radio and TV spots) to provide information and encourage behavior change, especially related to risk reduction and improved biosecurity in the backyard poultry. The strategy also promoted institutional collaboration in messaging and highlighted the public sector’s AI interventions as part of a more comprehensive zoonotic disease response.

The Communication Strategy also defined institutional roles and responsibilities including coordination among institutions at central, provincial and local levels. The strategy differentiates among the different stages of AI and influenza pandemic, including pre-pandemic, pandemic and post-pandemic stages. For each stage involved, objectives, messages to be communicated and the factors behind these messages were identified in detail. The Strategy also places special focus on training, including bio-security measures and recognizing avian influenza symptoms in animals and humans.

A public information campaign was launched as a major tool of the communication strategy. The print and media products that were generated offer a creative approach to promoting dialogue and raising awareness and responsibility among different audiences. In essence, the campaign fosters an enabling environment for preventive activities, at the individual, household and community levels. The communication materials included:

- Design of a logo
- An internet portal for avian influenza
- 9 TV spot films, 9 radio spots
- 6 posters, 6 brochures
- A 30 minute documentary film
- Design of a cartoon film character
- Media kit
- Newspaper Inserts

The communication materials were sent to all 81 provinces for distribution by the Provincial Offices of MARA. The communication products aim at highlighting the actions of participating ministries and mobilizing group resources to contain outbreaks, generating social trust and credibility.
Backyard Poultry

One important objective of the AIHP project is restructuring the backyard poultry sector and improving sector biosecurity in sectors 3 and 4. The project with FAO support commissioned an in-depth study to review the biosecurity situation especially at level 3 and 4 holdings, to identify the key risk areas, and to identify and develop pilots to address the risks. A $1 million USAID grant was provided to the project to support avian influenza communications and five biosecurity/biosafety pilots:

(i) **Mobile Information Kiosks for Markets in Rural Areas**: This activity raised avian influenza awareness among rural people living in high risk areas and increase face to face dialog between specialists and villagers to enable a targeted flow of information in villages, and to make information available for large numbers in a cost effective manner. Ten minibuses were purchased and converted to fully equipped Mobile Information Kiosks with a DVD Player, overhead projector etc. The MIKs have been distributed to 8 MARA Research Institutes around the country, and carry out a regular circuit of village visits on market days.

(ii) **Effective Monitoring of Spent Hen Transportation**: After the 2006 outbreaks, spent hen sales were forbidden in Turkey, but this proved very hard to regulate. This pilot improved data collection and transmission to shorten the time allocated for tracking the movement of poultry, to assure accurate data on the movements, and to reduce the work load arising related to tracking transportation of poultry at the Provincial and District Directorates levels.

(iii) **Risk Reduction in Backyard Poultry**: This pilot introduced practices to improve biosecurity in backyard poultry, supported construction of coops to house poultry indoors, particularly during risky periods (Fall/winter). The 357 coops were built by voluntary participants in four pilot provinces (Konya, Balikesir, Batman, Kars). Equipment and materials for coop building were provided to the villagers in order to demonstrate the benefits of keeping poultry protected and enclosed.

(iv) **Improving Perceptions of Bio-Security Risks for Small and Medium Scale Commercial Broiler and Egg Producers**: This pilot raised awareness about risks regarding bio- security and precautions to be taken among small scale commercial producers through training to improve biosecurity practices among small enterprises. Training programs were delivered in 52 provinces, covering on farm biosecurity, biosafety and biosecurity essentials, epidemiology of AI and dangerous poultry diseases.

(v) **Wetland Users Risk Reduction**: This pilot aimed to create awareness about the contamination risks associated with the wetlands, to reduce the risks to the direct users (reed cutters, hunters, fishermen and shepherds), and to create awareness about the contamination risks for the family members, to the community, backyard poultry and shared spaces, vehicles and equipment. The activities were carried out as part of the communications campaign, in cooperation with hunters’ and bird watchers’ associations.
Turkey has been free from avian influenza since 2008. Outbreaks in 2007 and early 2008 were quickly contained, thanks to both better preparedness for response, and targeted, accurate communications. With international support and consistent attention by the Government, Turkey has overcome critical periods; raising awareness among public has contributed significantly to such an outcome. However, each winter season brings new risks of avian influenza outbreaks, and so it is important to continue providing information about the risks and appropriate responses.
Annex 9: Reporting on the Field Visits

Simulation Exercise for Avian and Human Influenza (H5N1) Control

Simulation exercises are part of the US$20 million Vietnam Avian and Human Influenza Control and Preparedness project (VAHIP). The project's development objective is to increase the effectiveness of government services in reducing the health risk from avian influenza to poultry and humans in eleven high priority provinces, thus contributing to addressing HPAI at the national level by controlling the disease at source in domestic poultry, by early detection and response to poultry and human cases and by preparing for the medical consequences of human pandemic—if it occurs--over the next five years.

The project uses outbreak simulations as both a diagnostic and a monitoring approach to assess the readiness of systems and personnel at each level and to gain insights into linkages and coordination between levels and between sectors. The project aims, among other things, at: (1) an assessment of the current surveillance system, its performance at different levels (from the community to the provincial levels) and comparisons with other countries’ systems, (2) piloting interventions geared towards improving the surveillance systems in the project provinces, based on the above-mentioned assessment, (3) improving the quality of reporting and management of data to enhance its use for decision making, (4) implementing an Early Warning and Response System with extensive penetration to the community through village health workers, (5) selection and training of a Rapid Response Team that effectively responds to suspected outbreaks and collaborates with other sectors, (6) building capacity for surveillance and adequately equipping and protecting staff involved in investigations, (7) fostering coordination and collaboration with other key sectors such as animal health workers in surveillance, and (8) epidemic simulation exercises to test preparedness measures and coordination structures.

Most importantly, the OPI integration and coordination subcomponent provides support for (a) the establishment of a Secretariat under the nascent National Steering Committee for Avian and Human Influenza, (b) development of coordination mechanisms between the animal and human health sectors at various levels (for instance, undertaking coordination meetings, joint programs, national HPAI outbreak simulations, and the like), and (c) conducting regional outreach activities beyond Vietnam.

The Long An’s Peoples Committee and VAHIP Project Management Unit have already conducted such simulation control exercises to help prepare agencies and citizens alike in properly responding to an outbreak of H5N1. The simulation exercise for H5N1 control showcased during the event included a hypothetical scenario which envisaged the engagement of six rapid response teams and eight separate stages for containment. The six teams were responsible for isolation, quarantine areas, epidemiology investigation, patient transfers and infected area treatment and poultry vaccination. These teams were also augmented by the health care services and the security team. The eight stages were:
1. Collection of official information

After receiving information about a suspected avian influenza case, commune animal health workers go to the suspect area to inspect the case and report on it to the district steering committees, which will work out measures for control and prevention. Skill acquisition from this task:

- detect the outbreak based on information collected on poultry flocks and clinical signs
- apply the outbreak reporting procedures by commune/district animal health staff/officials and local authorities after the information about avian influenza suspected cases is received
- provide measures for households for disease control and prevention
- trace the origin of infection and identify other poultry at risk
- liaise with the health authorities

2. Simulation on coordinating mechanisms for operating and directing urgent epidemic control of A/H5N1 influenza by a steering committee at the district level

The aim of this task is to direct, operate and command coordination of influenza control at the local level. The task outputs include:

- detailed planning for epidemic control
- rapid response teams take given order and are ready for the assignment
- issuance of the order for epidemic control

3. Simulation on the construction of an isolation fence (conducted by team 1)

The purpose of this task is to build an isolation fence around epidemic area to prevent infection from spreading to passers-by. Outputs from this task include:

- Building an in line with the existing regulations isolation fence, notice signs and safe isolation corridor
- assignment of team members to protect the isolation area

4. Practice establishment of human and animal health checkpoints and mobile quarantine tasks (conducted by team 2)

The purpose of this task is to carry out quarantine for humans, animals and vehicles passing by the epidemic area. Outputs from this task include:

- identification of the appropriate places for checkpoints and content for epidemic control
- cleaning and disinfection of vehicles passing by the epidemic area
- assessment of officers’ execution of regulation on epidemic control at checkpoints
5. Simulation of communication for epidemic control, epidemiology investigation and specimen transfer (conducted by team 3)

The purpose of this task is to take orders from the steering committee, identify households for epidemiology investigation, and communicate epidemic control measures to the community. Outputs from this task include:

- epidemiologic investigation, obtaining specimen sample and transfer of the specimen as indicated in the regulations
- communication on basic measures for epidemic control to the villages
- specific content for communication on epidemic control and prevention and use of the hotline number

6. Simulation of first-aid treatment for patients at home and transfer of suspicious cases to an isolation ward (conducted by team 4)

The purpose of this task is to:

- take orders from the steering committee
- command for gathering teams to check needed equipment and assign tasks
- move to required place as directed by the commander
- carry out first-aid treatment and patient transfer to the isolation ward

Skill acquisition from this task includes first-aid treatment, safe patient transfer and infection control.

7. Poultry culling, cleaning and disinfection (conducted by team 5)

The purpose of this task is to:

- examine an infected poultry flock (quantity, species, weight, number of dead birds/living birds...) for compensation and culling, determine the size of burial hole and related inputs, ask the infected households for collaboration
- catch and cull all infected birds in a humane way, collect waste and put it into sacks for disposal, carry out cleaning, de-contaminate and disinfect infected premises
- calculate the size/area of keeping house/shed to determine the amount of disinfectant, instruct farmers about ways to prevent infection, carry out cleaning, disinfect the outbreak area and the nearby locations

8. Ring vaccination (conducted by team 6)

The purpose of this task is to prepare for and apply ring vaccination procedures, including:
collect and consolidate data/information prior to vaccination in order to arrange for staffing and resources

- consolidate and update data/information at the end of each day on vaccination and report to veterinary station/outbreak control committee
- vaccinate all flocks of poultry in commune (except flocks that have been vaccinated under existing regulations and flocks identified as suspected cases, if any)
- during the vaccination, any flocks having signs of avian influenza should be reported immediately to the disease control committee and the vaccination team must cease the work

**HPAI Laboratory Diagnosis System and HPAI Surveillance in Vietnam**

In its efforts to streamline and improve their response to potential avian influenza outbreaks, Vietnam continues to implement various strategies which help lessen response time, improve data collection and expedite tests and reactions at the national and international levels. Regional Animal Health Offices (RAHO) 6 and 7, who gave a presentation during the field trip, contribute significantly to this ongoing laboratory diagnosis system and surveillance process.

The presentation given by RAHO6 featured the national veterinary laboratory diagnosis system organization, laboratory networking, a surveillance program, and provincial veterinary diagnostic laboratory development. RAHO7 briefed the participants about its main functions and tasks, personal and organizational structure, laboratory diagnostic capacity, laboratory staff training and ongoing difficulties.

The Government of Vietnam and its partners have invested in laboratory networks within Vietnam to detect H5N1 HPAI viruses. Now, all seven diagnostic laboratories are well equipped and capable of rapidly diagnosing H5N1 HPAI (using real-time RT-PCR) and other diseases, which contributes to a better understanding of the sources of infection. At present five diagnostic laboratories are rated as biosafety level 2 and biosafety level 2+ negative pressure rooms are available at the National Center for Veterinary Diagnostics (NCVD) in Hanoi and RAHO 6 in Ho Chi Minh City. Much of this increased capacity was established following the emergence of avian influenza, and now cases can usually be confirmed within 24-48 hours.

Establishment of the national laboratory network in October 2005 resulted in better communication, sharing of information and experience, and problem-solving co-operation. Laboratory networks aim for achieving quality assurance. As a result, two of the laboratories have been designated by WHO as National Influenza Centers and as H5N1 reference facilities. NCVD obtained ISO 17025 certification in December 2008. VAHIP helped establish such quality assurance and biosafety program.

Regular workshops are held within this laboratory network to ensure that the most up-to-date technical knowledge on diagnostic procedures is shared. Thanks to these investments and coordination, combined with strong intersectoral cooperation among Government ministries,
stakeholders (including poultry farmers and others engaged in poultry trade, NGOs, and international organizations) Vietnam is better prepared to manage H5N1.

The ability of a country to rapidly detect and respond to an incursion of HPAI depends on the presence of surveillance systems that ensure the reporting of suspicions of disease and the collection and processing of suitable samples in competent laboratories to produce a reliable diagnosis. Creating such a surveillance system requires an alert and engaged community at all levels, trained and equipped staff to investigate reports and collect samples and a well-equipped laboratory with trained staff to conduct reliable testing. Several components are necessary in order to establish an effective surveillance system, including good communication strategies and programs to achieve community awareness and engagement, trained field investigators and epidemiologists and trained laboratory staff in well-equipped laboratories. The laboratory network in Vietnam is responsible for conducting post-vaccination and virus circulation surveillance in 28 provinces, including 16 intensive poultry farms.

The key success factors in Vietnam’s provincial veterinary diagnostic laboratory development include:

- Real demand in the province for animal diseases testing, including veterinary authority and producers
- Strong support from the provincial authority, including provision of equipments and staff, and veterinary regulations on animal diseases control is implemented
- Strong technical support from the laboratory of RAHO, including provision of technical consultancy during development of the laboratory, training staff, and proficiency testing program
- Good cooperation among the veterinary authority and laboratories in the region

Challenges include:

- Transportation of avian influenza positive samples from RAHO7 to the NCVD in Hanoi for virus isolation
- Budget for setting up the waste water treatment system and for applying accreditation of ISO 17025 for avian influenza and other disease testing
- Equipment calibration and maintenance
Annex 10: One Health Framework for Estimating the Economic Costs of Zoonotic Diseases on Society

Many human diseases have been contracted from domestic and wild animals throughout history. As the ecology of human-animal interactions expands globally, zoonotic diseases represent a growing source of risk to human health and livelihoods. In addition to impacts on human health, zoonotic diseases affect a broad range of industries and activities, including livestock, food and textile production, tourism, international trade, land use, and household pets. In most countries, including developing countries, rapid response and control is assigned the highest and most urgent priority, and these efforts are generally undertaken on a sector-by-sector basis. In the immediate and short terms, the effects of zoonotic diseases across sectors and throughout the greater national economy tend to receive less attention, as do their environmental effects.

Zoonotic diseases impose significant economic impacts in addition to the costs of control. By reducing the sales of livestock products they reduce income among livestock producers and their households, and increase their vulnerability to other shocks because livestock is used in part as a means of risk management, particularly among small holders. Their effects on household wealth reduce the ability to save, and in so doing undermines future livelihood outcomes. Because women often own livestock, particularly smaller livestock, zoonotic diseases often worsen gender inequality. Their impacts on food supply diminish food and nutrition security. In addition to these household level impacts, zoonotic diseases also affect the entire livestock sector, with negative consequences for feed and other inputs. Other effects are economy-wide, for instance through output markets such as restaurants and hotels. Expectations about the level of these direct and indirect costs often drive decisions about whether or not to control a zoonotic disease.

Analyzing zoonotic diseases in terms of the social and ecological systems they affect can lead to a more complete understanding of the dynamics of any such disease, and of how its impacts in different sectors interact with each other. This broader purview promises to foster an interdisciplinary approach to disease surveillance and control, and most importantly, one that provides a framework for cooperation and division of labor between the professionals concerned with human and animal health. The concept of integrated human and animal health has been dubbed “One Health,” which not only underscores the inter-relatedness of human and animal health, but also the health of the ecosystems they inhabit. One Health was derived from the earlier concept of “One Medicine,” a term coined by veterinary epidemiologist Calvin Schwabe in the 1960s to capture the broader systemic interactions between human and veterinary medicine. For its part, the term One Health has become widely used, to the point that its usage has expanded to multiple definitions, sometimes leading to confusion and sometimes to the impression that it is a kind of buzzword. This is unfortunate given the promise of the concept to add value to the respective fields, including public health and environmental health.
How One Health adds value can be understood using a modified risk analysis framework to see how enhancing the control of zoonotic diseases improves economic outcomes in areas such as poverty, food security, and livelihoods. The framework is used to gauge the level of demand that is in place (particularly in developing country contexts) for reducing the risk of zoonotic diseases. A traditional risk assessment is undertaken for this purpose. The risk assessment includes a release assessment in which all potential pathways for disease emergence are identified. All potential pathways that lead to animal or human exposure to zoonotic pathogens are identified through an exposure assessment. A consequence assessment includes an analysis of impacts on livelihoods at the household level (this is the modification which makes this a departure from traditional risk analysis). Risk estimation, risk management, and communication of risk are also treated. This modified framework is presented graphically in Figure 8.

**Figure 8: Modified Risk Analysis Framework**

Stakeholder knowledge, attitudes, and perceptions, as well as their willingness to pay for various alternative control strategies are also included in the framework. Where appropriate, behavioral experiments may be used to assess stakeholders’ uptake. A number of cost-effective risk-minimizing strategies have been identified. A monitoring and evaluation plan is employed to measure the uptake of different interventions, and their impacts on livelihoods outcomes, for example income, health and nutrition. Research teams will need to work closely with national partners to build their capacity.
in the areas of epidemiology socio-economic data collection, risk analysis, livelihood analysis and behavioral experiments. Collaboration will also be needed to develop a comprehensive communication and outreach component to ensure adoption of the interventions.

Outputs of such modeling efforts will enable decision makers to evaluate the cost-effectiveness of various control measures and their combinations in reducing risk from a variety of angles. Not all analytical tools mentioned need to be done at once, but the goal of this framework is to set out the menu of potential types of analysis decision makers may want to use to help inform them in areas where they may need more insight prior to taking action. This is important as decision makers are often faced with the problem of evaluating a “portfolio” of mitigation techniques to obtain some desired level of safety (or maximizing safety for a given cost). The strategy a risk manager chooses depends on the risk preferences of the affected stakeholders and on their comparative advantage in implementing particular risk-reduction options. Often, however, it is difficult for them to discern which is better because in one analysis they are looking at a strategy in terms of risk reductions and in another analysis they are viewing it in terms of costs and benefits. If they are not able to discern, what can happen is that decisions that are well intended can lead to losses in social welfare as unexpected outcomes develop, or as outcomes have unexpected consequences. Thus decision makers have a great need for a framework which structures information in a way which makes the complexity more tractable, but still takes into account the implications of the complexity.

A variety of tools can be used to assess potential impacts of control strategies to reduce the risk of zoonoses:

- Improved prevalence data collection in both animals and humans (underreporting in many developing countries)
- Quantitative/qualitative risk analysis (risk mapping, risk assessment, cost benefit/cost effectiveness analyses, disability-adjusted life year (DALY) analysis, dynamic disease transmission modeling)
- Livelihood impact analysis
  - Qualitative approaches (participatory poverty assessment, focus group discussions, etc.)
  - Nutritional and household level impacts
  - Demand and supply estimation
  - Market modeling (internal and external effects on trade)
- Value chain and institutional analysis
- Analysis on knowledge, attitude, perception, and practices and willingness to pay
- Expert elicitation
- Experimental and quasi-experimental methods

Figure 9 shows an example of an animal-human transmission model for Brucellosis indicating how it is transmitted from different types of livestock to humans. Efforts to effectively control the disease
will need to encompass a number of routes and involve number of sectors. Figure 10 shows that the benefits can be great.

Figure 9: Application of the Research Methods Toolkit on Brucellosis

Work examining supply and demand shocks associated with a disease such as HPAI found that a supply shock has a downward effect on poultry production and there is a small increase in price. Studies have shown that the supply shocks are small relative to poultry population (less than 2% in most countries). Similarly, the demand shock has a downward effect on poultry consumption. It is often discrete, mostly non-localized, no actual outbreak is needed, slows over time, but there is big decrease in price. Due to the reduction in prices, the demand shock prevails over the supply shock.
A study examining the economic impact of HPAI in Africa found that: 1) demand shocks driven by consumer panic are a foremost factor in the reduction of poultry production, 2) household income impact on the rural poor is not significant, and livelihood portfolio is diversified by most poultry producers, 3) overall effect on the economy on average is likely to be small including effects on poverty, regional and cross-sectional variation, 4) given small imports of poultry products in Nigeria, the impact on domestic production is larger relative to Ghana, and 5) economy wide effects of an HPAI outbreak are expected to be minimal due to the small size of the poultry sector and weak intersectoral linkages (e.g., in Ethiopia 98% of producers are traditional farmers).

A second study found that households predicted to keep poultry were likely to 1) have diversified income portfolios, 2) produce crop and other livestock, 3) source a small share of overall household income from poultry, and have multiple income sources, which enables them to be resilient against shocks. In addition: 4) small-scale poultry producers are unlikely to be significantly affected by HPAI shocks, 5) the poorest of the poor in Africa do not produce poultry, and 6) HPAI shocks could induce some poultry producers to fall below the poverty line.

A third study examined the impact of a potential HPAI shock on nutrition and found that animal-source foods provide critical micronutrients (iron, zinc, and vitamin A) to young children. Using data from Indonesia, a sustained shock which resulted in poultry-free diets (or a substitute) could result in 30% stunting, 17% underweight, 11% wasting and 65% anemic among the population.
Similarly, work in Kenya indicated 34% stunted, 16% underweight, 8% wasting among the population.

There are several tools available for the evaluation of risk management options (CBA/CEA), including spreadsheet models of country control programs. CBA/CEA use household survey data to analyze the poor’s knowledge, attitudes and perceptions towards HPAI and control measures, and the poor’s willingness to pay for different control measures. A decision model using Monte Carlo simulations can compute expected economic impact given probability of an outbreak and choice of control measures.

Currently, evaluations of control efforts are underway along the lines of the One Health framework described above. These include spreadsheet models of country control programs, household surveys to conduct CBA/CEA, analysis to understand the poor’s knowledge, attitudes and perceptions towards HPAI and control measures at the household level, analysis to estimate the poor’s willingness to pay for different control measures, and a decision model using Monte Carlo simulations to compute expected economic impact given probability of an outbreak and choice of control measures.

Figure 11 illustrates the type of simple spreadsheets being developed at the Ministry level to evaluate the cost and benefits of control efforts.

**Figure 11: Spreadsheet Model of the Costs and Benefits of Control Measures at the Institutional Level**
Making efforts to reduce the risk a disease does not necessarily result in a reduction in risk as people are not always willing to change behavior. Thus IFPRI researchers argue that there is also a need to understand people’s knowledge, attitude, and perceptions about a zoonotic disease and understand if these actually result in behavioral change. In addition, there is a need to understand at what amount are people willing to pay to implement control strategies or accept in terms of compensation so as to alter behavior in cases where control efforts have not been implemented. Such analyses can help identify efficient and effective solutions for reducing the risks of zoonotic disease along value chains. Surveys can be developed to randomly interview a targeted population about the potential benefits of risk reduction measures and the benefits of adoption (increased productivity, reduce animal and human health outcomes), and the respondents can be asked to participate in a hypothetical market in which they can be asked what is their willingness to pay to purchase the control measures. This is important as there may exist control strategies to reduce the risk that are not currently in use in many transitional countries, making it difficult to estimate the value of economic benefits of these control strategies from health, production and market data.

Lastly, behavior experiments on interventions are needed to understand what really works on the ground. IFPRI researchers thus propose, in the countries where we evaluate the cost and benefits and effectiveness of various interventions, that randomized trials of specific zoonotic control mechanisms be done (in addition to an educational package aimed at subsistence farmers), incorporating a cost-effectiveness analysis and the impact on human and animal health. This can later be followed by a monitoring and impact evaluation to determine the adoption levels and the impacts on human and animal health. Such experiments would include randomized selection of possible treatment and control villages. In the treatment villages we will provide the educational package and could try a variety of different ways of providing the information of the educational package. The educational packages could then provide information on the possible interventions to minimize the presence of a zoonotic disease. Given the work is in transitional countries and the focus is on finding solutions for the poor, IFPRI researchers suggest that the interventions tested should focus in the low- and medium- cost interventions and promote the use of those through the educational packages, and also include information on the more expensive alternatives. Which interventions are looked at will be based on a cost benefit and cost effectiveness analysis study.

Table 3 illustrates the results of analysis examining people’s knowledge, attitudes and perceptions (KAP) surrounding HPAI control. Results indicate that 80% of producers heard of HPAI, but only few could correctly identify symptoms. In addition, there was not a significant variation in KAP indices of free range/backyard and small-scale market oriented. Results indicated that larger market-oriented producers had higher KAP indices. Further results indicated that producers who have higher KAP indices tended to be more diverse and have larger flocks, history of poultry diseases & HPAI in their villages, higher income and income from poultry activities, and female household heads.
Table 3: Knowledge, Attitudes and Practices Analysis

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<thead>
<tr>
<th>KAP Indices</th>
<th>All producers (N=669)</th>
<th>Back yard/Free range (N=179)</th>
<th>Smallscale/Commercial (N=345)</th>
<th>Larger Market oriented (N=145)</th>
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<tr>
<td>Symptoms</td>
<td>1.09 (0.61)</td>
<td>1.10 (0.59)</td>
<td>1.07 (0.62)</td>
<td>1.08 (0.61)</td>
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<tr>
<td>Transmission</td>
<td>5.57 (1.41)</td>
<td>5.62 (1.38)</td>
<td>5.45 (1.47)</td>
<td>5.76 (1.30)</td>
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<tr>
<td>Control &amp; Prevention</td>
<td>2.77 (1.16)</td>
<td>2.77 (1.25)</td>
<td>2.75 (1.12)</td>
<td>2.80 (1.20)</td>
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<tr>
<td>Treating sick fowl</td>
<td>2.10 (0.85)</td>
<td>2.10 (0.75)</td>
<td>2.05 (0.86)</td>
<td>2.21 (0.89)</td>
</tr>
<tr>
<td>Disposal of dead fowl</td>
<td>6.01 (0.66)</td>
<td>6.01 (0.64)</td>
<td>5.99 (0.68)</td>
<td>6.04 (0.65)</td>
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<tr>
<td>Poultry flock size</td>
<td>96.35 (251.52)</td>
<td>21.01 (10.14)</td>
<td>58.65 (16.19)</td>
<td>256.11 (478.31)</td>
</tr>
</tbody>
</table>

The IFPRI presenter gave several examples of work IFPRI researchers are currently involved in looking at the impacts of two types of zoonotic diseases on society and evaluating the costs and benefits of control options to illustrate the importance of taking a One Health approach to disease control. They are currently writing up a full methodological framework describing the approaches summarized here and will then go forward and implement the strategy in several countries in the World Bank’s ECA Region. One of the first studies being considered is examining brucellosis in Kyrgyz Republic.

For more information about the subject please refer to www.hpai-research.net.
# Annex 11: Avian and Human Influenza Projects

<table>
<thead>
<tr>
<th>Project Name</th>
<th>ID</th>
<th>IBRD/IDA</th>
<th>Country</th>
<th>Status</th>
<th>Approval</th>
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<tr>
<td>Avian Influenza Preparedness</td>
<td>P111509</td>
<td>0</td>
<td>Morocco</td>
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<tr>
<td>Henan Ecological Livestock Project</td>
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<tr>
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<tr>
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<td>Mexico</td>
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<tr>
<td>Vietnam Livestock Competitiveness and Food Safety</td>
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<tr>
<td>MAP Additional Financing</td>
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<td>Nigeria</td>
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<td>Integrated Disease Surveillance Project</td>
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<td>Health Sector Reconstruction and Development Project - Additional Financing</td>
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Annex 12: Evaluation Tools

Tool for the Evaluation of the Performance of Veterinary Services (OIE)

Evaluation of the Performance of Veterinary Services (PVS) is a tool employed by OIE to evaluate national veterinary services capability and capacity, and has been intensively used in client countries participating in the AHI Facility. It is a prerequisite and key guide for investment requests. It is performed upon request of a country on a voluntary basis.

PVS assesses Veterinary Services under four broad categories: (a) the human, physical and financial resources to attract resources and retain professionals with technical and leadership skills; (b) the technical authority and capability to address current and new issues including prevention and control of biological disasters based on scientific principles; (c) the sustained interaction with stakeholders in order to stay on course and carry out relevant joint programs and services; and (d) the ability to access markets through compliance with existing standards and the implementation of new disciplines such as the harmonization of standards, equivalence and zoning. It examines compliance with OIE standards, strengths and weaknesses, and gaps/areas for improvement.

OIE PVS evaluation is qualitative, independent, objective, performed by experts trained and certified by OIE, and confidential. Next step in the evaluation process is quantitative assessment of corresponding needs, the Gap Analysis. It is a baseline for investment programs, and determines country priorities and cost estimates.

International Health Regulations (WHO)

The IHR provide a global framework which enables all countries to strengthen protection against the international spread of epidemics and other public health emergencies. The IHR provide a global legal framework for protection against the international spread of epidemics and other public health emergencies.

The WHO is the official international technical partner collaborating with the Bank’s GPAI and is responsible for epidemic and pandemic alert response and preparedness, H5N1 virus tracking and characterization, and developing a human influenza vaccine bank. The participation by WHO in the GPAI includes assisting Human Health components of AHI projects in developing pandemic preparedness for the health sector and case management initiatives, and providing consultants to conduct studies, supervise project components, and provide other technical inputs.

WHO has assisted client countries with development of pandemic preparedness plans and with strengthening of disease surveillance. Because the IHR are not limited to specific diseases but apply to new and ever-changing public health risks, they are intended to have long-lasting relevance in the international response to the emergence and spread of disease. They also provide the legal basis for important health documents applicable to international travel and transport and sanitary protections.
for the users of international airports, ports, and ground crossings. The IHR can also apply to other public health emergencies such as chemical spills, leaks and dumping, or nuclear melt-downs.

*The One Health Operational Guide and Self-Assessment Tool* (Draft, ARD, World Bank)

The main objective is to provide World Bank operational staff and its clients with a self-assessment tool they can use to evaluate their institutional readiness and how well they are working and cooperating with other disciplines in programs, projects, and communications in the management of emerging infectious diseases.

The self-assessment tool will be developed under the format of a questionnaire/check-list to be used by countries to help them reflect and determine the degree to which they have adopted, where appropriate, the One Health approach in their animal and human health programs, policies, institutions and operations, and determine if they are taking advantages and maximizing gains in efficiency and effectiveness offered by that approach.

The following major areas of activities are considered for assessment by the tool using pertinent developed questions agreed upon by respective specialists:

1. Institutional and legal arrangements to determine to which degree institutions and current legislation facilitates or constraints One Health
2. Degree of joint strategy planning
3. Degree of sharing human and physical resources
4. Degree of joint financing One Health related activities
5. Degree of cooperation in surveillance systems and early detection
6. Degree of cooperation in emergency preparedness and control
7. Degree of cooperation in bio-security, and inspection activities
8. Degree of integration of laboratory related activities
9. Degree of joint educational/training activities
10. Degree of cooperation for research activities
11. Degree of cooperation and planning for communication activities

The tool will use qualitative indicators to assess the performance in integration/cooperation achieved by a specific country in the above-mentioned sectors. Graded indexes of level of integration/cooperation will be developed and assessed against the performance of a given country in the adoption of the One Health approaches in the management of zoonotic diseases.
**Gap Analysis Tool for Zoonotic Diseases: Evaluating Performance of Zoonosis Control in Public Health Systems**  
(Draft, Europe and Central Asia Region, World Bank)

The tool was developed to improve the zoonotic public health practice and national health authorities (MoHs). The objectives of the tool are three-fold: 1) to allow MoHs to identify which functions and capacities are in place and which others need to be instituted in order to address zoonoses and improve public health practice’ 2) to allow MoH to identify how they can bu substantive partners in an integrated interdisciplinary alliance that addresses zoonoses control, prevention and elimination; and 3) to allow MoHs to identify areas of convergence where the public health arena could collaborate and coordinate efforts with other sectors and organizations in the spirit of the One Health strategic framework.

The tool is complementary to the OIE’s PVS tool and is designed to be used by countries of varying capacities. It builds on PAHO Public Health in the Americas regional initiative and its methodology which aims to measure the performance of essential public health functions.

The tool is divided into eleven sections, one for each Essential Zoonosis Control Function:

1. Monitoring, evaluation and analysis of health status as it relates to zoonosis
2. Public health surveillance, research, and control of zoonotic risks and threats to public health
3. Health promotion in zoonosis control and prevention
4. Social participation in zoonosis control and prevention
5. Development of policies and institutional capacity for planning and management of zoonosis activities
6. Strengthening institutional capacity for regulation and enforcement in zoonosis and public health
7. Evaluation and promotion of equitable access to zoonosis-related services
8. Human resource development and capacity building in zoonoses and public health
9. Quality assurance in personal and population-based zoonosis-related services
10. Strategic research on zoonoses and public health
11. Controlling and preventing zoonoses in emergency and disaster situations
Health Systems Assessment Approach Manual (USAID)

Health Systems Assessment Approach Manual provides a snapshot of health system performance across the six building blocks of the health system. This approach is designed to provide a rapid, comprehensive assessment of key health systems functions. It is organized around technical modules that guide data collection and cover the following areas:

- Governance
- Health financing
- Health service delivery
- Human resources
- Pharmaceutical management
- Health information systems

It also can be tailored to specific initiatives or diseases, such as HIV/AIDS, TB, malaria, and maternal and child health. The manual provides some guidance for linking findings to the USAID Mission’s strategic objectives and can inform an in-depth analysis of priority health programs (such as a family planning or malaria assessment).

Assessing the Economics of One Health (Draft, ARD, World Bank)

To make the case for One Health at this decision making level, hard data on the economic and financial costs is needed. This data would need to cover: (a) the potential costs to the economy of emerging zoonoses; (b) the costs and benefits of controlling animal and human diseases; and (c) the cost savings and eventual efficiency gains resulting from the introduction of One Health.

There is a good deal of information on the costs of the emerging zoonotic diseases and on the cost and benefits of disease control (although almost exclusively focusing on individual diseases) but there is a complete dearth of information on eventual cost savings and efficiency and efficacy gains from the introduction of a One Health approach.

The Assessment focuses on the costs of setting up prevention and control systems for zoonotic diseases and the efficiency gains from the introduction of One Health. It does not include new analytical work on the cost of emerging and endemic zoonoses, nor on the cost and benefit of disease control, which are only summarized as background information. In particular, the Assessment provides:

- An overview, in an easy accessible form, of the costs to establish and operate the various components of prevention and control of emerging and endemic zoonotic diseases (surveillance, diagnostics, etc). This data could also serve as benchmarks in the One Health Operational Guide and Self-Assessment Tool, which ARD is developing to help countries to assess the degree of integration among animal (both domestic and wildlife) and public health services; and
• Levels of cost savings under different scenarios and degrees of integration of services under a One Health approach.

Finally, it contributes to better decision making on the allocation of resources for the prevention and control of emerging and endemic zoonotic diseases and convincing policy makers on the merits of One Health.

Economic Analysis-Prevention versus Outbreak Costs (OIE)

Commissioned by the OIE, this study was conducted by Agra CEAS Consulting Ltd. from November 2006 to March 2007 with some further updating in September 2007.

The objectives of this study were to clarify the relative direct and indirect impacts and the economic cost of different types of animal diseases and assess the costs and benefits of global and national animal disease prevention and control, in particular through appropriate governance allowing early detection and notification and rapid response within all parts of a country. The costs of the appropriate governance (in compliance with OIE international standards) were compared with the potential cost of crisis resulting from diseases such as avian influenza.

For the purposes of the analysis, prevention and control costs have been defined as the costs incurred by governments during ‘normal’ times, i.e. in advance of outbreaks. In particular, these include:

• Emergency preparedness, in terms in particular of the existence of emergency preparedness plans and the state of veterinary services more generally,
• Surveillance networks, in terms in particular of diagnostic capacity and border controls.

For the definition of outbreak costs a differentiation was made between direct costs and losses, and the various indirect costs and indirect losses as follows:

A. Direct impact

The total direct cost of a disease is the sum of the production losses (direct and consequential) and the costs of disease control, as follows:

• Direct losses: These stem either from the disease itself, or from sanitary control measures (stamping-out policies). In addition to the loss from the value of animals culled as such, there are culling and disposal costs.
• Control costs: Such costs during and after the outbreak typically include equipment, facilities, disinfectants, protective clothing, staff in quarantine stations etc. They may also include (ring) vaccination where this is considered appropriate and is available.
• Other direct production losses: Consequential on-farm losses include losses due to the fall in stock, to restrictions of movement when zoning restrictions are put in place, and due to the loss in animal value.
B. Indirect impact

The indirect impact of livestock diseases includes ripple effects, spill-over effects and costs to the wider society including longer term macro-economic effects. These costs are defined as follows:

- **Ripple effects:** Ripple effects include impacts on livestock and livestock product prices and on upstream and downstream activities along the livestock value chain upstream and the producer: breeding, feed production, input supply, production, collection and trade (of eggs or live birds), slaughter, processing, final sale and consumption.

- **Spill-over effects:** Apart from agriculture as such and the impact of diseases along the affected livestock sector’s value chain, tourism and services are the two other sectors most likely to be severely affected. The macro-economic impact can consequently be severe if these two sectors are important in the economy. In addition, as already indicated, animal diseases can have major effects on food availability and quality for poor communities and therefore raise issues of food security, as well as having negative effects on poverty alleviation.

- **Wider society:** Developing or transition countries, which tend to have inadequate/inefficient public health systems, are particularly exposed to the risk of zoonoses on public health. In the particular case of a pandemic, a large proportion of the economic losses are caused by higher morbidity and mortality rates in the human population and by its repercussions on the world literature.

**Benefits include:**

- Enhanced food security / poverty alleviation including the benefits accrued from productivity improvements and generally improved production systems.

- Improved market access

- Savings in potential outbreak costs

Overall, the results clearly demonstrate that the potential costs of an HPAI outbreak are a multiple of the investment required for effective prevention. This suggests that the potential benefit of improved prevention is very substantially higher than the cost of the investment, depending on the underlying scenarios and assumptions. If the effects of a human pandemic are added to the equation, then the economic benefits – beyond avoiding the loss of human lives as such – by far outweigh the costs. Beyond these benefits, there are clear implications in terms of poverty alleviation and food security as the producer costs and losses of an outbreak are disproportionately felt by those most in need: the poorer rural communities of the developing world.
These results have implications for policy-making. An important element of animal health prevention policies is the control of risks at source, hence the advantages of improved prevention in exporting developing countries accrue not just to them but also to importing developed countries. Apart from providing solidarity as such in facing crises and assisting the developing world to come out of the poverty deadlock, the potential benefits that can accrue to developed countries from improved disease prevention and preparedness at source in developing countries is a major argument for the mobilization of funding from the international community. The nature of the potential costs and benefits also determines the rationale and potential extent of involvement of public and private initiatives in mitigating the effects of an outbreak.
### Annex 13: Initial Experiences in Implementing One Health

<table>
<thead>
<tr>
<th>Country</th>
<th>Disease focus</th>
<th>Incidence</th>
<th>Importance at human/animal ecosystems interface</th>
<th>Key actions taken</th>
<th>Results</th>
<th>Source</th>
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</thead>
<tbody>
<tr>
<td>Tanzania (HALI project)</td>
<td>Bovine Tuberculosis, food and water borne diseases</td>
<td>At least 8,000 new cases /year, and unknown number of diarrheal diseases</td>
<td>Originates in wild-life and livestock, water</td>
<td>Multi-disciplinary team focused on medical, ecological, socio-economic and policy issues driving the system</td>
<td>Improved understanding of epidemiology and spatial distribution of diseases and pastoral perception of disease led to better control</td>
<td><a href="http://www.haliproject.wordpress.com/">www.haliproject.wordpress.com/</a></td>
</tr>
<tr>
<td>Kenya, Madagascar</td>
<td>Rift Valley Fever</td>
<td>At least over 1,000 cases in one outbreak</td>
<td>Mosquito-borne virus affecting sheep, cattle and men, strongly climate related</td>
<td>Kenya: Multi-disciplinary group with human, veterinary and wildlife institutions formed</td>
<td>Kenya: Risk-based contingency planning tool developed, emergency fund and communication channels established Madagascar: Improved prediction and mapping of outbreaks, reduced number of human cases</td>
<td></td>
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<tr>
<td></td>
<td>Multiple programs</td>
<td></td>
<td></td>
<td>Arbovirus Incidence and Diversity group Madagascar: Integrated approach between Ministries of Agriculture and Health</td>
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<td>Canada Public health Agency</td>
<td>All zoonoses following SARS outbreak</td>
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</table>

Annex 14: One Health Template
DRAFT

Efforts to prevent and respond to the outbreak of HPAI have demonstrated that most countries were not sufficiently prepared for such a catastrophe. Many low- and middle-income countries had largely neglected their veterinary and public health services during the last decades, the effects of which will take time to overcome. Veterinary services are the fulcrum in the prevention, control and eradication of zoonoses, yet to be fully effective they require strong complementary public health and wildlife services.

However, current division of labor among public institutions leads to a segmented or vertical organization of work, in which institutions operate independently of one another and from the perspective of their discipline or sector. This leads to gaps, and sometimes overlaps, and inefficiencies in resource utilization.

Each country will approach implementing the One Health approach differently depending on geographic, economic and other factors. Nonetheless, experience with HPAI confirms that a coordinated response embedded at the country level, with complementary investments at the regional and global levels, is essential.

This draft template, developed subsequent to the Learning Exchange, can help Bank teams and client countries to determine which One Health elements are needed on a case-by-case basis.

Background

Provide synopsis of the occurrence of avian influenza and other zoonotic diseases occurrence in the country, using the OIE-WAHID and the WHO databases, and other statistics, assess response to date, and elaborate on assistance received from the World Bank Group and other organizations as well as the status of the project(s) where applicable.

Briefly assess country animal and human control systems, including identification of areas in which the national level of preparedness and the quality of response to outbreaks are affected by and/or dependent on actions taken in the neighboring countries or at the global level.

- Animal side: surveillance, bio-security, diagnostics, control/vaccination, culling, compensation
- Human side: surveillance, diagnostics, control/investigation, vaccination

Assess weaknesses in livestock production systems, including value chains, food safety standards, trade regime and importance of zoonotic diseases in the country.

Identify zoonotic diseases or disease(s) of interest to the client. Prevention and control of diseases at the animal-human-ecosystems interface becomes a global public good if the disease: a) is highly infectious, b) has a strong impact on human well-being and c) has strong transboundary
characteristics. Prevention and control of diseases of low human epidemic potential are typically national public goods.

Sector Diagnostics

Strengthening Veterinary Health Services

Successful delivery of veterinary services has evolved in many countries to include five essential stakeholder groups: (a) livestock producers and their organizations, (b) a national public veterinary service, (c) a private veterinary sector, (d) statutory regulatory body supported by a regulatory and legislative framework, and (e) a veterinary professional association. Each stakeholder group has different responsibilities and may represent different stakeholders. Ideally, the five stakeholder groups interact with checks and balances so that all clients are fairly represented. The logic and rationale for the participation of each stakeholder group, and for assigning specific tasks and responsibilities, are based on economic, biological, and social principles.

Unfortunately, many of these basic elements for an effective veterinary service are lacking in the developing countries, which are at the greatest risk. The improved division of function between public and private responsibilities has increased the quality of on-farm clinical services in many cases. However, it has had a nominal impact on public or regulatory veterinary services, as was clearly illustrated with the spread of HPAI. There is no summary available of the PVS analysis carried out to-date. Key aspects of particular importance in One Health, which arise from the nine PVS reports (as of March 16, 2010) which are in the public domain, are:

- Weak links between the Ministries of Agriculture and Health;
- Weak chain of command between central, regional and field offices;
- Lack of funds and financing mechanisms for emergencies, in particular for compensation; and
- Poor domestic food safety control systems.

ARD Publication Minding the Stock (2009) has in particular highlighted the lack of clarity in the distribution of responsibilities between the public and private sector.

The report needs to provide a synopsis of the PVS, gap analysis or country sectoral strategic plan where available, but if not, it will need to focus on aspects, which require additional attention. The report will also need to provide description of the proposed veterinary services strengthening activities and funding requirements. Guiding questions to be answered from the One Health perspective include:

- How is the disease surveillance organized at field level, for example (a) are there joint surveillance teams; (b) how is the communication between the public health and veterinary post organized?; (c) what are the incentives/disincentives for the farmers and other households to declare animal or human disease cases?; and (d) are there cases of delayed reporting of disease outbreaks because of these disincentives?
- Which, if any of the surveillance and diagnostic facilities are jointly used? How can this be encouraged?

- How long does it take on average to report a disease outbreak between the field and the head-office, and how long does it take to feed back the results and the instructions on measures to take at the field level? What is needed to strengthen the efficiency and effectiveness of disease reporting?

- What are the respective mandates of the local, regional and national offices, for main public function, like: declaration of a disease outbreak, imposition of movement control, vaccination policy, culling strategies and decisions on the procedures and level of compensation payments?

- What is the share of funds for surveillance, early warning and control of emerging and re-emerging diseases? If it is not adequate, what particular aspects need to be strengthened?

- How are the meat and milk inspection organized (oversight, man-power) and how are the results (number of rejections)? What would be needed to improve it?

- What is the role of the private veterinarians and para-veterinarians in the surveillance and control of emerging zoonotic diseases? What would be needed to strengthen their roles?

**Strengthening Human Health Services**

Health services include four essential components: Ministry of Health organization, geographical distribution of health services, human resources, and health-care financing. Special emphasis should be given to addressing food safety in public health, ensuring health insurance coverage for rural poor, and exploring options for outreach health services for remote villages.

The report should provide synopsis of IHR implementation, and its effectiveness in the control of HPAI and H1N1 outbreaks. Under IHR, the countries have agreed to establish by 2012, core capacities to detect, assess, and report potential health threats, and the report should focus on progress made in that country towards that goal and the needs to identified to meet the 2012 targets. Of particular importance is the establishment of:

- Systematic approaches to surveillance, and early warning systems;
- Two way focal points for disease reporting;
- Country sharing of information of public health risks of international concern.

The report, based on the IHR assessment, should provide information on proposed human health services strengthening activities and funding requirement. It could cover the same questions mentioned under the Veterinary Health Services, but, include also questions on hospital and other quarantine facilities. In addition, questions related to the economics of food safety (DALY of HALE) should also be included.
Wildlife Monitoring

Monitoring wildlife health will help predict where trouble spots will occur and plan how to prepare for them. Wildlife health science is an essential component of global disease prevention, surveillance, monitoring, control and mitigation.

Guiding questions:

- Is the county monitoring and reporting wildlife health and related changes in the environment?
- Is the wildlife disease monitoring system integrated with the national (Ministry of Health, and Agriculture) and international (WHO, OIE, FAO) veterinary and human health networks as part of early warning systems for the emergence and resurgence of disease threats?
- Is there expertise available in wildlife biology in the veterinary services?
- List and rank the most main migratory pathways, and identify the areas, where wildlife comes into close contact with humans and food animals;
- List and rank the prevailing wildlife diseases, which can be transmitted to food animals, pets, or human diseases;
- What is needed to strengthen the surveillance systems for wildlife diseases?

The proposed activities and funding requirements would normally include strengthening of the surveillance system, with intensive surveillance in the “hotspots” (for example, those wildlife areas in close proximity to human populations) and less intensive in the more remote areas.

Communication

Behavior change communication is a critical element, both during inter-epidemic periods and in response to an outbreak or unusual circumstance that may represent a public health threat. The most successful experiences in the AHI response have underscored the importance of an integrated communication strategy within human and animal health response strategies. Adequate resources therefore must be available for long-term communication for behavior change, social mobilization and policy advocacy.

The amount of funds spent on communication can be significant (i.e. 5-10 percent of the total budget), especially if mass media, which are often the most effective—and expensive—channel for widespread dissemination, are used. On the other hand, relatively small investments in building the capacity of governments to develop, implement and evaluate communication strategies are critical. For example, without undertaking baseline studies to understand current behaviors and their drivers, it will be difficult to develop appropriate strategies. Creative approaches need to be developed that enable communication strategies to support the program goals in the most cost-effective ways. Therefore, the key for developing effective communication strategies is to build human capacity, as well as to ensure the minimum resources required for operational costs are available for all stages, from strategy development to ongoing monitoring and evaluation.
Guiding questions:

- What is the share of the budget of early warning and control systems for emerging zoonotic diseases used for communication?
- Is public risk perception understood?
- Is there an efficient community-tailored risk communication plan, which differentiates between the various stakeholders (producers, processors, retailers, politicians and consumers)?
- Is there an emergency communication plan?
- Who decides on (a) the technical content; (b) the format and scope of the message; (c) the dissemination channels used; and (d) who coordinates the overall process?
- Are there risk communication regulations and protocols for dissemination of information during emergency?
- Is there a framework for risk communication evaluation?
- Is there cooperation and planning for communication activities across the animal-human-ecosystems health domains?
- What are specific communications challenges?

The proposed activities and funding requirement would normally include the establishment of a communication plan, including some test runs and the necessary hardware and funds for the preparation and dissemination of targeted messages.

**Participation in Regional and Global Initiatives related to One Health**

Elaborate on country engagement in regional and global initiatives dealing with One Health.

The proposed activities and funding requirement would normally include subscription fees and attendance at international meetings.

**Research**

What research topics have been identified taking into consideration the interface of animal–human–ecosystems health domains in the country? In particular, have “hotspots” been identified?

**One Health Components**

The following strategic priorities (detailed in chapter 6) in the context of the animal–human–ecosystems interface underpinning the One Health approach can be used as project activities or components:

- In-country champions;
- Joint priority setting and preparedness planning, including the identification of hot spots;
- Preparation and implementation of legislation and a regulatory framework, which promote One Health through obligatory disease reporting and decision making processes, etc.;
Establishment of an institutional framework, that facilitates enhanced cooperation and communication among agencies responsible for human, animal and eco-system health, which can range from setting up of memoranda of agreement between the services, joint One Health task forces or permanent teams to partial-integration of the services;

- Establishment of incentive framework, through joint budgets of the services, and the provision of special grants mechanisms for One Health activities;
- Joint surveillance and diagnostic systems for pandemic and endemic diseases;
- Joint communications; and
- Development of educational curricula, in particular at the university level, which integrate human, veterinary and eco-systems health.

**Institutional Audit**

Using One Health Operational Guide and Self-Assessment Tool (draft, ARD), identify opportunities and gaps in the institutional framework for implementation of One Health in the following areas:

Institutional and legal arrangements to determine to which degree institutions and current legislation facilitates or constrains One Health

1. Degree of joint strategy planning
2. Degree of sharing human and physical resources
3. Degree of joint financing One Health related activities
4. Degree of cooperation in surveillance systems and early detection
5. Degree of cooperation in emergency preparedness and control
6. Degree of cooperation in bio-security, and inspection activities
7. Degree of integration of laboratory related activities
8. Degree of joint educational/training activities
9. Degree of cooperation for research activities
10. Degree of cooperation and planning for communication activities

Guiding questions:

- What is the optimal degree of integration for the different functions of human, veterinary and eco-systems health services for an effective prevention and control system tasks (i.e. surveillance, diagnostic, bio-security and control)?
- What is the most appropriate institutional set-up for sectoral cooperation when implementing One Health (i.e. MoU between independent services, partial integration of some functions or establishment of a single One Health agency)?
Country Economic Analysis of One Health

Using Assessing the Economics of One Health World Bank report (draft, ARD), quantify the costs of setting up enhanced prevention and control systems for emerging and endemic zoonotic diseases, and the potential cost savings from the implementation of One Health approach and resulting potential efficiency and effectiveness gains in the country.

Guiding questions:

- What are the savings in staff and facilities resulting from the introduction of One Health?
- How much will introduction of One Health help in enhancing the effectiveness of the prevention and control of emerging zoonotic disease(s)?

Based on the above assessment, identify activities with specific investment costs, suitable project design and instruments (APL, TAL, SIL, P4R, TA, other):

Activities and costs:

Project design:

Instrument:
Annex 15: Selected One Health Follow-on Investments

Kyrgyz Agricultural Investment and Services Project

The Kyrgyz Republic has received funding from IDA, IFAD, SDC and additional financing from EC towards implementation of the Agricultural Investments and Services Project and intends to apply part of the proceeds for consultant services. The Government of the Kyrgyz Republic is also providing funding towards the implementation of the project. The overall objective of the Project is to improve the institutional and infrastructure environment for farmers and herders, with a strong emphasis on the livestock sector, and improvement of food security. To achieve this, the Project will increase farmers’ productivity including livestock farmers in the project areas and reduce animal diseases that have a public health impact (e.g., brucellosis). The services include the coaching, supervision and training of service providers for establishment of private veterinary services in Chui, Talas and Issyk-Kul oblast of the Kyrgyz Republic, and procurement of vaccine Rev-1 against brucellosis.

Central Asia One Health Project

Signing of the Grant Agreement (Regional One Health Project) marked the start up of the new Project, activities of which are designed as a core element of the Central Asia Regional Health Platform, which has been initiated under the Central Asia AIDS Control Project (CAAP).

Establishment of regional public health platform was undertaken within the scope of Regional strategy on prevention of HIV-infection epidemic, which was developed by the Eurasian Economic Community taking into account the trend of epidemiological situation in Central Asian countries, as well as lessons learnt from coordination and harmonization of the efforts of many partners at national level, as well as at regional level. Gained experience in the area of prevention of infectious and zoonotic infection worldwide, as well as in Central Asia, shows the effectiveness of the regional initiatives that requires joining and harmonizing efforts at regional level. $3.0 million USD in grant funding will be targeting activities in public health and veterinary services in Kazakhstan, Kyrgyzstan, Tajikistan and Uzbekistan. The Project consists of three main components:

1. Gap Analysis and Development of Action Plans for Veterinary and Public Health Services
2. Economic Assessment of the Impact of Zoonotic Diseases
3. Food Borne Diseases and Food Safety

More information at http://www.caap.info/ca_en/about_1.php

Azerbaijan Agri-food Modernization Project (CN June 2011)

Agricultural Development Credit: The objectives are to: (a) enhance competitiveness of agricultural products, (b) increase rural productivity and incomes; and (c) enhance agricultural support services
including advisory and veterinary services. Project Concept Review Meeting scheduled for 15 June 2011. Environmental Assessment Category F. US$ 75.0 (IBRD). Consulting services and implementing agency(ies) to be determined.

**Moldova Food Safety Project**

This Sanitary and Phytosanitary (SPS) action plan has its origin in the preparation of a policy note by the World Bank to assist the Government of Moldova in improving the functioning of agricultural markets. The key messages of this action plan have been highlighted in the policy note, but the scope and complexity of the SPS issues as well as their critical importance to the competitiveness of Moldova's agro-food sector warranted more systematic study and strategic planning. Hence this action plan was prepared to provide information about existing gaps in Moldova’s SPS management capacity and to recommend actions to address those gaps. The actions recommended are intended to bring about optimal benefits from participation in international trade while better protecting human and agricultural health in Moldova. Based on the findings of the missions and additional research conducted by consultants, a draft report was prepared in late 2005. It reviewed and analyzed government policies and institutional arrangements concerning food safety and agricultural health as well as existing technical capacities in SPS management in both the private and the public sector. As a starting point for the development of a strategic action plan for SPS management, it included priorities for public- and private-sector investment. This plan is a product of close cooperation among the Government of Moldova, local institutions, and international donor organizations. In practical terms, it provides the Moldova Republic with a strategy for capacity building to manage SPS requirements. The plan and its recommendations may be used as a basis for policymaking, priority-setting, regulatory and institutional reforms, and project investment.

**South Asia Region One Health Regional Training Program**

The World Bank has provided a grant to Massey University to develop a capacity development program to strengthen the response to outbreaks of major human and animal infectious diseases in three sub-regions of Asia (South Asia, Central Asia and East Asia). To date, this has been endorsed by the seven governments taking part in the South Asia program. The core element of this initiative is the development and delivery of a degree program at Massey University incorporating two new degrees: a Master of Public Health (Biosecurity) for medical doctors and a Master of Veterinary Medicine (Biosecurity) for veterinarians. The benefits of the degrees will be:

- By remaining in their home country, candidates can work at their own pace and remain at work (part-time), leading to a reduced loss of work productivity;
- Through offering comprehensive and integrated training at a higher and more standardized level than ad hoc short courses, the training will better meet the needs for epidemiological skills and biosecurity expertise in the region;
- Such a degree program will be more cost-effective and efficient for training a large number of people, and will enable establishment of sustainable internal resource groups. These
resource groups, envisioned as ‘One Health Hubs’, will continue to service national needs and support the continuing development of skills for a wide range of people in the countries.

This program is the first of its kind to operate in the Asia-Pacific region, and is intended to meet the needs of countries throughout this region. The program consists of two phases: phase one provides Masters-level training of public health doctors and veterinarians; phase two will establish and strengthen trans-disciplinary professional networks to ensure sustainability and implementation of applied activities.


Food safety and livestock projects in China/Mongolia

The objective of the Henan Ecological Livestock Project for China is to improve environmental health management practices on the targeted livestock farms in the Yellow River Belt in Henan province of the Borrower. There are three components to the project. The first component of the project is institutional strengthening, training and technical support. Improving the technical understanding and institutional management capacity at the province, municipal and county levels of on-farm management of livestock waste processes through, inter alia, strengthening of public institutions, provision of training, technical assistance and management support to livestock farms in the areas of animal health and waste management, carrying out awareness raising activities and establishment of a Geographic Information System (GIS). The second component of the project is environmental management in existing and new farms and livestock parks. Constructing and equipping facilities in small scale and medium size beneficiary farms/parks for waste minimization, animal health, waste management and waste treatment, and for demonstrating ecologically standardized livestock farming in selected beneficiary farms/parks, including provision of civil works, equipment and technical assistance for construction design and supervision. The third component of the project is project management, and monitoring and evaluation. Strengthening institutional capacity at the province, municipal and county levels to implement the project and to establish and implement an effective monitoring and evaluation system through, inter alia, provision of equipment, materials, vehicles, training and technical assistance, including establishment of a computerized Management Information System (MIS).


Integrated Livestock-based Livelihoods Support Program in Mongolia (GAFSP proposal)

The National Livestock Programme (2010) defines its purpose (without specifying indicators) as:

- to develop a livestock sector that is adaptable to changing climatic and social conditions and create an environment where the sector is economically viable and competitive in the market economy;
- to provide a safe and healthy food supply to the population;
• to deliver quality raw materials to processing industries; and
• to increase exports.

**EU-Mongolia Animal Health and Livestock Marketing Project**

The main objective of the project is to support the Mongolian Government in its efforts to reform its services in the agricultural sector to the rural population thereby alleviating poverty. Purpose of the project is to improve livelihoods of rural populations living on livestock production by establishing a productive and market-oriented livestock sector.


**Vietnam Livestock Competitiveness and Food Safety Project**

The objectives of the Livestock Competitiveness and Food Safety Project for Vietnam are to increase the production efficiency of household-based livestock producers, to reduce the environmental impact of livestock production, processing and marketing, and to improve food safety in livestock product supply chains (mainly meat) in selected provinces. There are three components to the project. The first component of the project is upgrading household-based livestock production and market integration. The key objective of this component is to support the improvement of: (a) the competitiveness of household-based livestock production; (b) food safety and hygiene along the meat supply chain; and (c) the environmental management of livestock waste. The second component of the project is strengthening central-level livestock and veterinary services. This component will support the strengthening of the capacity of the Department of Livestock Production (DLP) and the Department of Animal Health (DAH) under Ministry of Agriculture and Rural Development (MARD) in developing and monitoring the implementation of bio-security, livestock disease control, animal production technology, food safety, and livestock waste management policies and technical standards. The third component of the project is project management, and monitoring and evaluation. This component will provide support to project implementation through the strengthening of coordination of the various government agencies at central, provincial and district levels, and the monitoring and evaluation of project activities and impact.


**India National Dairy Support Project - pipeline**


**Zambia: Livestock Development and Animal Health Project – pipeline**
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