PROJECT PERFORMANCE ASSESSMENT REPORT

REPUBLIC OF TAJIKISTAN

AVIAN INFLUENZA CONTROL AND HUMAN PANDEMIC PREPAREDNESS AND RESPONSE PROJECT
( IDA GRANT H-244-TJ, GPAI GRANT TF-57768)

July 13, 2012

IEG Public Sector Evaluation
Independent Evaluation Group
Currency Equivalents (annual averages)

(Exchange Rate Effective as of February 03, 2011)
Currency Unit = Tajikistan Somoni (TJS)

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Abbreviations and Acronyms

FAO: Food and Agriculture Organization of the United Nations
GPAI: Global Program for Avian Influenza
HPAI: Highly Pathogenic Avian Influenza
ICR: Implementation Completion and Results Report
IEG: Independent Evaluation Group
M&E: Monitoring and Evaluation
NSC: National Steering Committee
Oblast: Administrative Region
OIE: World Organization for Animal Health
PMU: Project Management Unit
PPAR: Project Performance Assessment Report
Rayon: Administrative District
UNICEF: United Nations Children’s Fund
WHO: World Health Organization

Fiscal Year

Government: January 01 – December 31
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This report was prepared by Rahul Raturi, who assessed the project in December 2011. The report was peer reviewed by Willem G. Janssen, and panel reviewed by Ridley Nelson. Yezena Yimer provided administrative support.
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### Principal Ratings

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* The Implementation Completion and Results (ICR) report is a self-evaluation by the responsible Bank department. The ICR Review is an intermediate IEG product that seeks to independently verify the findings of the ICR.

### Key Staff Responsible

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<th>Project</th>
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IEG Mission: Improving World Bank Group development results through excellence in independent evaluation.

About this Report

The Independent Evaluation Group assesses the programs and activities of the World Bank for two purposes: first, to ensure the integrity of the Bank’s self-evaluation process and to verify that the Bank’s work is producing the expected results, and second, to help develop improved directions, policies, and procedures through the dissemination of lessons drawn from experience. As part of this work, IEG annually assesses 20-25 percent of the Bank’s lending operations through field work. In selecting operations for assessment, preference is given to those that are innovative, large, or complex; those that are relevant to upcoming studies or country evaluations; those for which Executive Directors or Bank management have requested assessments; and those that are likely to generate important lessons.

To prepare a Project Performance Assessment Report (PPAR), IEG staff examine project files and other documents, visit the borrowing country to discuss the operation with the government, and other in-country stakeholders, and interview Bank staff and other donor agency staff both at headquarters and in local offices as appropriate.

Each PPAR is subject to internal IEG peer review, Panel review, and management approval. Once cleared internally, the PPAR is commented on by the responsible Bank department. The PPAR is also sent to the borrower for review. IEG incorporates both Bank and borrower comments as appropriate, and the borrowers’ comments are attached to the document that is sent to the Bank’s Board of Executive Directors. After an assessment report has been sent to the Board, it is disclosed to the public.

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IEG’s use of multiple evaluation methods offers both rigor and a necessary level of flexibility to adapt to lending instrument, project design, or sectoral approach. IEG evaluators all apply the same basic method to arrive at their project ratings. Following is the definition and rating scale used for each evaluation criterion (additional information is available on the IEG website: http://ieg.worldbankgroup.org).

**Outcome:** The extent to which the operation’s major relevant objectives were achieved, or are expected to be achieved, efficiently. The rating has three dimensions: relevance, efficacy, and efficiency. Relevance includes relevance of objectives and relevance of design. Relevance of objectives is the extent to which the project’s objectives are consistent with the country’s current development priorities and with current Bank country and sectoral assistance strategies and corporate goals (expressed in Poverty Reduction Strategy Papers, Country Assistance Strategies, Sector Strategy Papers, Operational Policies). Relevance of design is the extent to which the project’s design is consistent with the stated objectives. Efficacy is the extent to which the project’s objectives were achieved, or are expected to be achieved, taking into account their relative importance. Efficiency is the extent to which the project achieved, or is expected to achieve, a return higher than the opportunity cost of capital and benefits at least cost compared to alternatives. The efficiency dimension generally is not applied to adjustment operations. Possible ratings for Outcome: Highly Satisfactory, Satisfactory, Moderately Satisfactory, Moderately Unsatisfactory, Unsatisfactory, Highly Unsatisfactory.

Risk to Development Outcome: The risk, at the time of evaluation, that development outcomes (or expected outcomes) will not be maintained (or realized). Possible ratings for Risk to Development Outcome: High, Significant, Moderate, Negligible to Low, Not Evaluable.

Bank Performance: The extent to which services provided by the Bank ensured quality at entry of the operation and supported effective implementation through appropriate supervision (including ensuring adequate transition arrangements for regular operation of supported activities after loan/credit closing, toward the achievement of development outcomes. The rating has two dimensions: quality at entry and quality of supervision. Possible ratings for Bank Performance: Highly Satisfactory, Satisfactory, Moderately Satisfactory, Moderately Unsatisfactory, Unsatisfactory, Highly Unsatisfactory.

Borrower Performance: The extent to which the borrower (including the government and implementing agency or agencies) ensured quality of preparation and implementation, and complied with covenants and agreements, toward the achievement of development outcomes. The rating has two dimensions: government performance and implementing agency(ies) performance. Possible ratings for Borrower Performance: Highly Satisfactory, Satisfactory, Moderately Satisfactory, Moderately Unsatisfactory, Unsatisfactory, Highly Unsatisfactory.
Preface

This is the Project Performance Assessment Report (PPAR) for the US$6.8 million Avian Influenza Control and Human Pandemic Preparedness and Response Project (IDA Grant H2440, and GPAI Grant TF-57768) under the Global Program for Avian Influenza Control and Human Pandemic Preparedness and Response. It was co-financed by the United Nations Children’s Fund (UNICEF) and the World Health Organization (WHO).

The project was selected for evaluation, along with similar projects in Albania, Armenia, and Romania, to learn more about the early experience of the World Bank’s efforts to address the threat of the spread of avian influenza in the Eastern Europe and Central Asia Region.

The project was approved on June 29, 2006 and became effective on October 18, 2006. It was financed in part by a grant of SDR3.4 million (US$5.0 million equivalent). At project closure SDR3.3 million had been disbursed and the balance was cancelled. The project closed on August 31, 2010, nine months behind schedule.

The report was prepared by Rahul Raturi, IEG consultant. It presents findings based on a review of the project’s appraisal document, Implementation Completion and Results Report, legal documents, sector reports, and other relevant material. In addition, an IEG mission visited Tajikistan from December 6 to 16, 2011, during which field visits were made to commercial and household poultry farms in the west (Shahkrinav), and to Oblast and Rayon State Veterinary Department offices (including laboratories) in Kurgan Tube in the south. Discussions were held with government officials and agencies, project staff, civil society organizations, beneficiaries, key donors, and academia (see Annex B for the list of people met).

The mission would like to express its appreciation to World Bank resident mission staff Bobojon Yatimov, Senior Rural Development Specialist, and Ms. Farzona Mukhitdinova Operation Analyst, for very efficiently facilitating its work. The mission would also like to gratefully acknowledge all those who generously provided the time for discussions for the purposes of this assessment, and to the State Veterinary Department who facilitated the visits to the field.

Following standard IEG procedures, copies of the draft report were sent to the Government of Tajikistan for comments, however no comments were received.
Summary

The purpose of this report is to assess the development effectiveness of, and lessons from, the Bank supported Avian Influenza Control and Human Pandemic Preparedness and Response Project, which was processed using Emergency Procedures (Operational Policy (OP) 8.50). At the time of project appraisal in 2006, while Tajikistan had not recorded any case of avian influenza, there was a risk of an outbreak through waterfowl migration and cross border trade, as the neighboring countries had reported cases. The prevailing institutional environment in Tajikistan, in terms of the capacity to respond to this risk for both animal and human health was weak. Both the State Veterinary Department and the human health medical system were grossly under-resourced and suffered from a number of structural and capacity weaknesses common to post-Soviet and transition economies. At the same time, while the poultry sector was not important from an economic standpoint, it did touch the lives of a significant majority of the country’s population, many of whom are poor women and children, and relatively poorly educated; hence they represented a segment of the population which was at a greater risk.

The objective of the $6.8 million Avian Influenza Project was to minimize the threat posed to humans by highly pandemic avian influenza infection and other zoonoses in domestic poultry, and prepare for, control, and respond to an influenza pandemic and other infectious disease emergencies in humans. The project was approved on June 29, 2006 and became effective on October 18, 2006. It closed nine months later than planned, on August 31, 2010. Under the Bank managed Global Program for Avian Influenza (GPAI), the project was financed by: an IDA Grant of US$5.0 million equivalent; a $1.5 million grant from the Bank-managed and European Union-funded Avian and Human Influenza Facility; and co-financing of $0.2 million from the United Nations Children’s Fund (UNICEF) and $0.1 million from the World Health Organization (WHO).

The project launched campaigns to increase awareness about avian influenza, and about the need for proper handling of infected poultry. However, in the absence of a baseline showing the extent to which the population was not aware of avian influenza at the start of the project, it is not possible to get a sense of the scale of impact of the project. At the same time, an end of project survey did highlight gaps in awareness about safe and appropriate practices; this suggests an unfinished agenda.

On the animal health side, the upgrading of the Foot and Mouth Disease Institute laboratory in Dushanbe was a major development, creating technical capacity which had not existed earlier. Old technology and equipment from the 1970s was replaced. The wildlife monitoring and surveillance activities of the Institute of Zoology and Parasitology were developed. However, the quality and timeliness of reporting is still a weak point, on account of the fact that prevailing methods in the field are still manual, necessitating travel and verbal communications (as opposed to computers).

The project enhanced public health program planning and coordination, strengthening of the national public health surveillance systems, and strengthening health care systems response capacity. The establishment of a bio-security level 2 diagnostic laboratory in Dushanbe enhanced the capacity of the Sanitary-Epidemiological Service to identify and
manage health emergencies in the country. On the other hand, the laboratory faces the challenge of securing resources to procure expensive reagents and related consumables, which raises the important issue of sustainability. Even though avian influenza was never reported in the country, the capacities created proved effective in handling threats from communicable diseases. For example, infectious disease and early detection system proved effective when after a 13-year break polio reappeared in Tajikistan in early 2010.

The outcome of the project is rated as moderately satisfactory. The project was an emergency response to a perceived threat. Presently, no direct follow on Bank engagement either by way of an investment operation or additional support for the poultry or more broadly the livestock sector is programmed. Accordingly, the relevance of the project objectives to the current Country Assistance Strategy at closing is rated as modest. Both the objective of minimizing the threat to humans by avian influenza in poultry and the objective of preparing for a pandemic and other infectious disease outbreak in humans were substantially achieved. The project has improved the capacity of the animal and human health institutions. The system proved effective in handling threats from communicable diseases that the country has faced in recent years. However, the efficiency of implementation of the emergency project was modest. The risk to development outcome is rated as Significant. This is on account of the fact that due to budget constraints, the scale of activities supported under the project is already being curtailed and no follow on operation is planned to continue the program of capacity building, to consolidate on the developments initiated under this short three-year emergency response program.

Bank performance is rated moderately satisfactory, while that of the Borrower is rated satisfactory. The Bank did well in locating the task team leader in the field, and supporting the government in many ways in project implementation; and it appropriately co-opted international technical agencies to help implement the program. The Borrower was able to quickly mobilize once implementation commenced, and the technical agencies performed well despite the cross-sectoral complexity of the project. However, the use of one Project Management Unit (PMU) in such an environment did prove to be problematic, and some actions, particular on procurement and coordination with sector ministries, could have been better managed. In addition, implementation of the M&E component did not receive sufficient attention of supervision missions or the PMU.

Lessons and Perspectives

The lessons emerging from the experience of the project focus around the challenges going forward, of turning a promising beginning of good cross-sector work, into institutionalized sustained approaches, recognizing that the threat of avian influenza remains, albeit not necessarily in the immediate neighborhood of the country. The project was designed as an emergency response to a perceived threat that had not materialized at the time of project appraisal. At the same time, it was designed in a low institutional and human resource capacity environment, where the prevailing systems for responding to animal diseases had not changed much from the Soviet times. In such an environment, tensions arose between ensuring rapid implementation start up and the need to ensure that the implementation experience gets embedded in ongoing operations of ministries, and hence contributes more broadly to building capacity in a sustainable manner.
- **Emergency responses run the risk of low sustainability.** The preparedness built by this emergency operation will be rapidly eroded in the absence of a program (externally or internally funded) that goes beyond the life of the project, for securing the sustainability of preparedness to deal with future outbreaks.

- **The use of a Project Management Unit that is not fully integrated into the main ministries or operational departments can compromise country ownership and sustainability.** The arrangement in which the PMU was housed in the Ministry of Agriculture for a multi-sectoral project resulted in lower government ownership and contributed to some inefficiency.

- **The engagement of international organizations to support implementation of the emergency project had benefits in terms of technical rigor and potential consequences in terms of reduced ownership.** These agencies provide good cross-country links in situations where an issue straddles national boundaries, and where it is necessary to link up with technical institutions internationally. However, execution responsibilities for components need to be embedded within a government agency. In the case of this project, UNICEF was given responsibility for implementing the component on Public Awareness Building, leaving no government agency that felt ownership for the activities once the project ended, weakening sustainability of the program.

- **Where a project is aimed at mitigating a disease threat with an uncertain probability of occurring, the results framework should cover both scenarios—when the disease strikes and when it does not.** Intermediate outcomes need to be monitored to assess whether capacity is indeed improving and whether there are sustainable changes in preparedness, irrespective of whether the threat materializes. Given the prevailing institutional weaknesses, such measures would have been helpful to highlight to policy makers the need for concerted follow up action to ensure sustainability.
1. Background and Context

1.1 This report reviews the experience of the Avian Influenza Project in Tajikistan (US$6.8 million actual, 2006-2010), which was among the first projects prepared under the Global Program for Avian Influenza Control and Human Pandemic Preparedness and Control (GPAI) to improve readiness for a possible avian influenza epidemic in the Europe and Central Asia region (Box 1). It was processed using Emergency Recovery Assistance (Operational Policy (OP) 8.50) procedures, and was the first direct and substantive involvement of the World Bank in support of the poultry subsector in Tajikistan.

1.2 Tajikistan, which faced the potential threat of avian influenza, was the poorest of the former Soviet republics and among the poorest countries of the world. The rural population, which represented three-quarters of the country’s population, was mainly engaged in agriculture, with most owning small numbers of livestock. While current data on the importance of the poultry sector to the economy are not easily available, there has been a tradition of backyard poultry in Tajikistan. A consultant report prepared for the World Bank states that after independence and during the civil war, the number of chickens and turkeys had declined sharply (World Bank 2005). From the reported 6.6 million hens and turkeys recorded in 1991, only an estimated 675,000 were said to have been left by 1998. Since then there had been an increase in numbers, with 2.4 million reported in 2004 in Government statistics (the Food and Agriculture Organization, FAO, put the number much lower at 1.5 million). More recent reports suggest that the livestock sector has grown rapidly, with strong contributions from meat and milk production growth.

1.3 However, it appears that the scale of poultry within the livestock sector remains small in economic terms. A recent Bank report highlights the fact that while high growth rates have been observed for various parts of the livestock sector (which was accounting for 25 percent of gross agriculture output by 2008, with cattle, beef and milk dominating the sector), commodities such as eggs are unlikely to make a substantial contribution to the overall agriculture sector growth of the country; estimates for 2007 indicate that eggs made up only 1.2 percent of gross agricultural output for that year (World Bank 2009).

1.4 While the poultry sector has been small in global economic terms, most rural families own some chickens. It provides a means to supply family members with high quality protein and some additional income, especially for women. At the same time, as it is practiced in a manner requiring low resource inputs, poultry is often considered secondary to other agricultural activities by the family farm. The work related to this activity is mainly executed by women and children. In contrast to Soviet times, when an estimated 90 percent of the hens and turkeys were owned by state farms, in 2004 over 75 percent of the poultry was owned by small household farms, most of whom had little knowledge of intensive poultry farming that is available today and, equally importantly, had limited or no access to good veterinary services and to vaccination. This inevitably put a large part of the sector, and indeed a large part of the country’s population associated with it, at risk to the outbreak of diseases. In comparison, the commercial
poultry sector was relatively small; recent reports suggest that the share of the larger commercial farms in total poultry is increasing (World Bank 2006).

**Box 1: The Global Program for Avian Influenza Control (GPAI)**

The threat of a severe global human pandemic arising from mutation of the H5N1 virus has caused great concern to the international community. Billions of dollars have been pledged for efforts to control avian influenza. The Food and Agriculture Organization (FAO), World Organization for Animal Health (OIE) and the World Health Organization (WHO) have committed to work together. The international technical agencies realize that both human and animal health sectors have a stake in tackling pathogens that can threaten animal and human health and that responding to these diseases requires a multi-sectoral and multi-institutional response. The World Bank agreed to provide financial support to the effort being undertaken through these international organizations and has helped more than 50 countries.

The Bank has two main mechanisms to support client countries in this area: the Global Program for Avian Influenza (GPAI) and the multi-donor Avian and Human Influenza Facility. The Bank's Board of Executive Directors endorsed the GPAI in January 2006 and extended it in June 2009. The AHI Facility was also created in 2006 to assist developing countries in meeting financing gaps in their integrated country programs to minimize the risk and socioeconomic impact of avian and possible human pandemic influenza. In many cases, the facility co-finances projects under GPAI.

GPAI is a global horizontal Adaptable Program Loan (APL) that allows for the use of up to US$1 billion (an increase from the original amount of US$500 million) under which individual countries can obtain separate loans/credits/grants (depending on country case) to finance their own national projects. The overall program development objective for the GPAI is "to minimize the threat posed to humans by HPAI infection and other zoonoses and to prepare for, control, and respond to influenza pandemics and other infectious disease emergencies in humans." (World Bank 2005, p. 16).

The GPAI draws on an integrated approach developed in conjunction with FAO, OIE, and WHO. Countries can access funding to strengthen their veterinary 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 influenza pandemic. GPAI operations are processed using emergency procedures, which allow quick preparation and approval. A country qualifies for support for an emergency project under the Program when it demonstrates its commitment and readiness to implement early detection and rapid response measures appropriate to the specific country conditions. Different criteria were established for country participation on the basis of the gravity of the avian influenza situation in the country. Albania was considered an "imminent risk case" with the confirmation of the first case of infection in poultry in March 2006.

**Note:** OIE is an independent intergovernmental organization founded in 1924 with 178 members. Its mandate is to improve animal health worldwide. OIE’s headquarters are in Paris and there are 11 regional offices. In 2004 OIE member countries approved the creation of a single list of diseases to be notified to OIE. First outbreaks of all listed diseases should be officially notified to OIE within 24 hours.


1.5 At the time of project appraisal in 2006, Tajikistan had not recorded any cases of highly pathogenic avian influenza (HPAI), but there was a risk of an outbreak through waterfowl migration and cross border trade, as the neighboring countries (China, Kazakhstan, Russia, Turkey, Iraq, Afghanistan, and India) had reported cases of avian influenza. Tajikistan has been an important crossover country for migratory birds, flying from Central Asia to the southern areas of Afghanistan and Iran, during their fall/spring...
migrations. The project’s appraisal document—a Technical Annex for the emergency program—provides a good overview of the routes followed by the migratory birds, and the various locations which had become common points for the migratory birds to alight along their migratory path, often at lakes, rivers, and reservoirs inside Tajikistan (World Bank 2006). In some cases, these locations had become important wintering habitats for wild and migratory birds. The risk of HPAI virus transferring from birds utilizing the resting places, flyways, and their crossover points across the border were seen to extend over the entire western part of the country, parts of the central west, and the Tiger Jungle in the south which borders Afghanistan.

1.6 The prevailing institutional environment in Tajikistan, in terms of the capacity to respond to the above potential risks for both animal and human health, was weak. The State Veterinary Department had been an organization in transition since independence. It retained outdated strategies and infrastructure with respect to its national responsibilities for disease control and many of the policies and regulations intended for the veterinary services had not been prepared in detail. As noted in the appraisal document, the State Veterinary Department remained profoundly under-resourced (for example, only eight of the 65 offices in the rayons were equipped with motor vehicles) and poorly organized at all levels.

1.7 On human health, the medical system in Tajikistan suffers a number of structural weaknesses, common to post-Soviet and transition economies. There are structural capacity gaps in health policy, planning and management, both at the central level and among oblast, rayon and facility health administrators. Essential public health functions such as disease surveillance, human resource development, and health promotion are poorly carried out if at all. As noted in a report prepared for the World Health Organization (WHO), at the beginning of the project period, the health system in Tajikistan was facing numerous challenges, including a lack of skilled health care workers, laboratories, equipment, regulations and finance (WHO 2010). Furthermore, the structure of the health delivery system inherited from the Soviet Union is highly complex and hierarchical. The poor utilization of hospital services is due to inadequate financing, absence of necessary medicines, and a decline in the quality of hospital services. Overall, the impact of the resource constraint is evident in the very low utilization and access to health services (WHO 2010).

1.8 Given the above country and sector background—with the high risk of bird migration from infected neighboring countries, combined with a weak institutional capacity to effectively respond, and the poor rural households, women and children most at risk—Tajikistan was an appropriate candidate for receiving support under the GPAI. While the poultry sector was not important from an economic viewpoint, it did touch the lives of a significant majority of the country’s population, many of whom are women and children. These households were also part of the poorer segments of society that relied heavily on poultry meat and eggs to provide for a better livelihood. At the same time, they represented a segment of the population at greater risk in terms of being relatively poorly educated and not having access to services or advice. Moreover, the services

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1 In accordance with Operational Policy (OP) 8.50 on Emergency Recovery Assistance, the appraisal document is a Technical Annex rather than a Project Appraisal Document.
sector, in terms of both the veterinary services and the institutions responsible for supporting good human health in the country, were poorly organized and weak institutionally – and would have been insufficiently prepared to tackle the introduction of avian influenza in the country. The potential threats from avian influenza in Tajikistan can be categorized as follows:

- An outbreak among poultry, with economic cost for animal production.
- Human cases of influenza due to contact with infected animals, but not of a form that could be easily transmitted between humans. This would lead to a modest number of human influenza cases and possibly deaths.
- A strain of avian influenza transmissible between humans develops within Tajikistan, leading to an influenza epidemic or pandemic if not contained.
- A strain transmissible between humans develops elsewhere, causing a pandemic that spreads to Tajikistan.

1.9 Poultry outbreaks and cases of transmission from poultry to humans have already occurred in several countries. However, no cases have yet been detected in Tajikistan. A strain of avian influenza that is transmissible between humans has not happened recently anywhere in the world but the risk remains, both within countries and as transmitted from other countries.

2. Objectives, Design, and their Relevance

Objectives

2.1 As avian flu had not actually occurred in Tajikistan at the time of project preparation/appraisal, the primary objective of the project was to prepare the country for dealing with an outbreak, given that cases had been reported in neighboring countries and there was a risk of transmission through migratory birds. Accordingly, the objective of the Project, as set out in the Financing Agreement was to “minimize the threat posed to humans by highly pandemic avian influenza infection and other zoonoses in domestic poultry, and prepare for, control, and respond to an influenza pandemic and other infectious disease emergencies in humans.” At the time of appraisal, Tajikistan had weak capacity to deal with this threat, which at that time was thought to have a high risk of imposing a severe burden of disease and loss of productivity and livelihoods in the country. At a global level, the World Bank was playing an important role in rallying international support to combat the threat posed by avian influenza, and in preparing for a possible human pandemic.

Relevance of Objectives

2.2 Given the circumstances prevailing at the time of project appraisal, both in terms of the perceived threat of avian influenza coming into Tajikistan and the weak state of both awareness among the population and preparedness to deal with the potential threat, the project was clearly relevant. It is a country with low human resource capacity and,

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2 The objectives were similarly stated in the appraisal document.
given the prevalence of poultry in a vast majority of households within the rural population, which is both poor and relatively ill informed about animal related infectious diseases, there clearly was a rationale for going ahead with the project at a time when there was a threat of avian influenza coming into the country through contact with birds from adjacent countries. As women and children are the ones most involved in looking after the small flocks of backyard household poultry, they were special targets of the awareness raising program. However, since then, given the fact that there was no outbreak of avian influenza in the country, the relevance of the project to the country’s current development priorities and sector strategies is less clear. The new World Bank - Tajikistan Country Partnership Strategy for FY10-13, which was operative at the time of project closing, is focused on the twin objectives of reducing the impact of the economic and financial crisis on poverty and vulnerability, and on post-crisis recovery and sustained development (World Bank 2010). Support for improving health care, with expanded training for doctors and nurses involved in providing primary health care for the poorer segments of the population, is planned. However, continuation of the support for the livestock sector is not planned.

2.3 The threat of avian influenza remains, and more at a broader global level; also, given that there are risks associated with other possible zoonoses and human infectious diseases, the original project objectives remain relevant. Based on the meetings held with the Deputy Ministers for Agriculture and Health, the Government remains concerned about the issues related to the spread of infectious diseases, in line with the project’s objectives. In the case of the Ministry of Health, there is a clearer strategy for moving forward on the agenda for dealing with contagious diseases. However, on account of the competition for resources between development priorities, the Government finds itself constrained at present to continue and deepen the program initiated under the project. Furthermore, no substantive additional resources have been programmed, either by way of a donor supported investment operation or additional technical assistance support for the poultry or more broadly, the livestock sector. Accordingly, the relevance of project objectives is rated as Modest.

Design

2.4 Components. The project, which was part of a horizontal Adaptable Program Loan, consisted of the four components:

2.5 Public Information and Awareness ($1.00 million at appraisal, and $1.06 million at completion). Support for development and implementation of an HPAI public awareness and information program, including (i) policy advocacy and support for crisis communication management; (ii) public education through mass media; and (iii) social mobilization through community and school-based targeted interventions.

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3 As noted in the 5th Global Progress Report from the UN and the World Bank, the virus continues to circulate in domestic poultry in parts of Bangladesh, China, Egypt, Indonesia and Vietnam. Other countries continue to be affected sporadically with poultry outbreaks reported in Bhutan, Cambodia, India, Israel, Lao PDR, Myanmar, Nepal and Romania (United Nations 2010).
2.6 **Animal Health ($3.00 million at appraisal, and $2.15 million at completion).** Support for prevention, control, and total eradication of HPAI through: (i) enhancing animal health planning and coordination capability for HPAI prevention; (ii) strengthening field disease surveillance and laboratory diagnostic capacity; and (iii) strengthening HPAI outbreak containment plans, including US$800,000 earmarked for the establishment and operation of a Compensation Fund for HPAI outbreaks.\(^4\)

2.7 **Human Health ($2.20 million at appraisal, and $2.90 million at completion).** Support for reduction of the impact of a pandemic influenza virus through: (i) enhancing public health program planning and coordination; (ii) strengthening of national public health surveillance systems; (iii) strengthening health care system’s response capacity.

2.8 **Implementation Support and Monitoring and Evaluation ($0.30 million at appraisal, and $0.39 million at completion).** Strengthening the capacity for Project implementation, monitoring and evaluation, including audit, procurement, disbursement and financial management activities, through financing of operating costs incurred by the PMU for Project implementation.

2.9 **Implementation arrangements.** The implementation arrangements were guided by the emergency nature of the project, taking into account the limitations of institutional capacity that had to be tackled. Accordingly, a National Steering Committee was established to provide overall policy direction and implementation guidance, under the leadership of the Deputy Prime Minister, and which included representatives from the Ministry of Health, Ministry of Agriculture, Ministry of Finance, Ministry of Emergency Situations and Civic Defense, Aid Coordination Unit, Academy of Science, Academy of Agricultural Sciences, and other concerned agencies. An existing Project Management Unit (PMU) which had been implementing World Bank-financed projects, and had built up capacity, particularly for procurement and financial management, was retained for the project and set up within the Ministry of Agriculture. It acted as the Secretariat to the Steering Committee, and was responsible for coordinating and facilitating project implementation, as well as monitoring and evaluation, project procurement, and financial management.

2.10 Day-to-day implementation was to be carried out by the various Government agencies with support from specialized international organizations. In this context, the Animal Health component was implemented by the State Veterinary Department, the Institute of Zoology and Parasitology, and the Foot and Mouth Disease Institute which was renamed as the “Biochemicals” Scientific Production Facility, supported by the Food and Agriculture Organization of the United Nations (FAO). The Human Health component was implemented primarily by the Sanitary and Epidemiological Service, and the Medical Services Department of the Ministry of Health, supported by WHO. Finally, implementation of the Public Information and Awareness Building component was managed by the United Nations Children’s Fund (UNICEF) through the PMU with

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\(^4\) As outlined in the appraisal document, rapid response depends critically on the incentives for poultry owners to report quickly any sick and dead poultry. Without adequate compensation arrangements in place, poultry owners have no incentive to do so – the compensation fund would provide the incentive and facilitate culling and elimination of infected and at-risk poultry (World Bank 2006).
support from concerned ministries through a Technical Working Group, which included representatives from the Ministries of Agriculture, Health, and Education, the Committee on Emergency Situations, mass media, and local nongovernmental organizations

Relevance of Design

2.11 An outbreak of avian influenza had not actually occurred at the time the project was designed. Given the recognized weaknesses in terms of awareness and preparedness, as well as weak institutional capacity, the focus of the project was appropriately on reinforcing the key elements essential for tackling an outbreak and minimizing the threat of avian influenza or other infectious disease. Based on the information presented in the appraisal document, a rapid processing of the project using emergency procedures appears to have been justified. In this context, the component on public awareness and information was focused on rallying official support to deal with such an outbreak, and on increasing public awareness through a mass media campaign. The component on animal health was targeted at addressing the issue of a weak institutional environment and improving the regulatory framework, and strengthening the monitoring, containment, and national diagnostic capacity. In the case of human health, the focus was on strengthening the capacity of the public health system and putting in place systems to contain outbreaks in the event that avian influenza did find its way into the country. Overall, the relevance of project design is rated as Substantial.

Monitoring and Evaluation Design

2.12 As set out in the appraisal document, the key outcome indicators were: contained outbreaks in poultry with no demonstrated transmission from birds to humans; and an intersectoral surveillance system in place for both animals and humans. For each of the three main components (excluding the component on project management and M&E), intermediate outcome indicators were clearly defined. Responsibility for monitoring and evaluation was to be vested with the PMU’s Monitoring and Evaluation Specialist, who was expected to consolidate information provided by the different implementing agencies. The appraisal document is unclear on the overall scope and design of the M&E arrangements – monitoring was to cover physical implementation progress, use of project funds, project outputs, and project outcomes, but it is unclear what the expectations were vis-à-vis the need and scope of a baseline survey (for example on pre-project public awareness, speed of notification of suspected cases from the field, scale and speed of activities of diagnostic laboratories, as well as a qualitative assessment of capacity of both the veterinary and human health services to assess the effectiveness of the training provided) which could provide the basis for an end of project assessment.

3. Implementation

3.1 The project was approved at the end of June 2006, and became effective in October 2006. Total actual project costs were estimated at $6.80 million; including co-financing commitments of $0.2 million from UNICEF and $0.1 million from WHO. The financing gap of $1.5 million was covered from the European Union-funded Avian and Human Influenza Facility, which was approved in January 2007. For both UNICEF and
WHO (and also the FAO, which was contracted to provide technical services under the project), these were new activities in Tajikistan and were part of their respective global programs to respond to the avian influenza crisis. The project closed at the end of August 2010, following two extensions totaling nine months from the originally planned closing date.

3.2 The project’s objectives and design were not changed during the course of project implementation. A Level-Two restructuring was done towards the end of the project period, in June 2010, to allow for a reallocation of the IDA Grant proceeds, and a 2 month extension of the Closing Date for the IDA Grant from June 30, 2010 to August 31, 2010.

Planned versus Actual Disbursements

3.3 Table 1 summarizes the total project costs as planned, versus actual disbursements against each of the components. At the time of restructuring in June 2010, the resources for the Compensation Fund were reallocated, as there had been no avian influenza outbreaks. The Government assured that in the event of an epidemic, the required funds would be provided for compensating owners of affected poultry. Grant funds for setting up the Compensation Fund had earlier been disbursed in 2008, and had been kept in a separate account in a commercial bank. The reallocated funds were used to procure priority equipment and other goods under the Animal and Human Health components, and in particular to increase the total allocation for the Human Health component as compared to the original design.

<table>
<thead>
<tr>
<th>Component</th>
<th>Appraisal Estimate</th>
<th>Actual/Latest Estimate</th>
<th>Percent of Appraisal (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Public Awareness and Information</td>
<td>1.0</td>
<td>1.26</td>
<td>106</td>
</tr>
<tr>
<td>Animal Health</td>
<td>3.0</td>
<td>2.15</td>
<td>72</td>
</tr>
<tr>
<td>Human Health</td>
<td>2.2</td>
<td>3.00</td>
<td>132</td>
</tr>
<tr>
<td>Implementation Support and M &amp; E</td>
<td>0.3</td>
<td>0.39</td>
<td>132</td>
</tr>
<tr>
<td>Total Project Cost</td>
<td>6.5</td>
<td>6.80</td>
<td>100</td>
</tr>
</tbody>
</table>


Note: a. Includes costs expended by UNICEF ($0.20 million for component 1) and by WHO ($0.10 million for component 3), as co-financing for the project.

Implementation Experience

3.4 After a quick start to the project, with the induction of both FAO and the WHO as technical assistance agencies to support implementation and the contracting of input supply agencies, there was a slowdown in year 2, with disbursements falling behind the planned schedule. Firstly, problems were encountered in completing the arrangements for bringing UNICEF on board, as they had reservations in accepting the consulting contracting arrangements as required by the World Bank. However, UNICEF agreed to continue participating in the project using its own funding, which allowed for the start up of the public awareness related activities. In addition, after some initial delays, the contract between the PMU and the local Institute of Zoology and Parasitology was signed, allowing for the start up of the critical activities related to the surveillance of
migratory birds and wildlife. With regards to civil works, there were significant delays in completion of works in the Human Health and Animal Health laboratories, as well as the regional veterinary laboratories and the isolation rooms of the infectious disease hospitals. This delay was caused by lack of experience of the local construction firms in handling the sophisticated medical facilities in the absence of the detailed design for renovation.

3.5 Inevitably, some institutional issues arising from limited capacity and experience impacted the pace of implementation. For example, none of the implementing agencies including the PMU had past experience in working as implementing agencies directly with international organizations, which caused some problems particularly in the earlier part of the project. Here the role of the National Steering Committee became important, in helping resolve coordination issues between the different agencies and levels of government. There was also a sense that more effort could have been devoted to get Ministry departments and staff more involved in the implementation of the project – this was a view expressed in both the Agriculture and Health ministries.

3.6 In addition, despite the progress which the project was making in terms of rate of physical implementation and disbursements, issues arose on account of the capacity of the PMU and the other project stakeholders in contractual management, which required close oversight. It resulted in a number of defects in the completion of the equipment and civil works contracts for the rehabilitation of both laboratories, which needed to be resolved. There were instances of major discrepancies in goods delivered by suppliers to the key beneficiaries of the project, in terms of either goods being delivered which did not meet the specifications as outlined in the contracts, or with items missing. Importantly, it led to various disagreements between the PMU and the Ministry of Health, since there was a sense that the former did not have sufficient experience on dealing with health and medical related issues. Part of the problem may well have been due to the fact that the PMU was located in the Ministry of Agriculture, and did not have the technical capacity to deal with issues related to the procurement of health related equipment, materials and civil works.

3.7 With regard to the above issue, the project was also confronted with the fact that there was virtually no technical capacity available in the country at the time the project was initiated, to deal with aspects associated with the new laboratories, for both the animal and human health sides. The new equipment and laboratories represented a major upgrade for the country, and the PMU did not have the skills to deal with and adjudicate upon decisions where the agencies sought technical standards and equipment which they were not familiar with. Both the FAO and WHO proved helpful in resolving some of these technical issues.

3.8 Overall, the project was flexible in adapting to changing needs. Broadly, all planned outputs were delivered, but there were some problems on delays as well as of quality. Towards the end of the project, funds from the Compensation Fund were reallocated to procure other works, goods and services. This enabled an expansion in the scope of activities for the human health component in particular. On the fiduciary aspects, no issues were found during the course of this review.
Monitoring and Evaluation

3.9 Implementation of monitoring and evaluation was weak. Much of the efforts of the PMU and of the various agencies involved in project implementation were focused on monitoring the delivery of inputs and outputs; there was virtually no documentation available to suggest that attention had been devoted to outcome monitoring.\(^5\) The final M&E report prepared in May 2010 by an M&E expert has nothing to say about M&E under the project, suggesting that there was no substantive output on the M&E component.\(^6\) Part of the issue arose on account of the apparent lack of clarity in the appraisal document of what was to be expected, and the absence of a clear baseline against which project success was to be measured. The appraisal document indicates that the component would ‘develop an action plan for monitoring and evaluation’ which ‘will include baseline studies, ongoing participatory monitoring and evaluation, and final project evaluation’. It is unclear how effective the PMU was in pursuing the M&E objectives, and undertaking these tasks; given the short duration of the project, the absence of action early on resulted in the component being ignored, and no outputs being delivered. Finally, the project missed at least one opportunity of setting up a baseline, for at least part of the program, in the case of measuring the extent to which the population was unaware of avian influenza and its symptoms. Health Knowledge, Attitudes, and Practices surveys were done in 2006 and 2009 (UNICEF 2006, 2009). Unfortunately, the first survey was not structured in a manner such that it could be set up as a baseline against which progress under the project could have been assessed based on the results of the follow on survey in 2009 (UNICEF 2009). Better planning could have averted this oversight.

Safeguards Compliance

3.10 At appraisal, a policy exception had been requested and granted, by way of a waiver for completing the Environmental Assessment and Environment Management Plan until after Board Presentation, in accordance with the provisions of the operational policies. The project was accorded a category B; and in line with this, an Environmental Management Plan (EMP) was developed, which focused mostly on capacity building activities, including improving the regulatory framework and training, as well as on strengthening surveillance and analytical capacity for HPAI diagnosis. No major issues were found concerning its implementation.

4. Achievement of the Objectives

4.1 The discussion on the achievement of objectives below needs to be set in the context of the fact that avian influenza was not detected in any of the poultry in the

\(^5\) Other than the examples of items which could have been monitored, measures of improved response performance in the case of other diseases could also have been measured.

\(^6\) As noted in the end of project M&E report, the sources of information available were ‘progress reports for various components, anecdotal evidences from the field, informal interviews of the stakeholders from government, partners, civil society and witnessing the field activities,’ confirming that no data on outcome monitoring was available at the end of the project.
country, nor did it appear among the migratory birds that flew through Tajikistan. Consequently, there was no real threat posed to humans during the project period by HPAI in poultry. At the same time, the services did respond to some other contagious diseases, such as polio and brucellosis, neither of which was experienced on the scale of a major epidemic as was foreseen for avian influenza at the time of appraisal. Given that avian influenza did not strike in Tajikistan, project impact has been assessed in terms of overall institutional preparedness in the event that it was to strike. In this context, while it may prove to difficult to get a sense of the actual scale of the achievements under the project, it has certainly contributed to building local capacity in areas which had not received attention since the end of the Soviet period, and improved the awareness among the population on avian influenza and more generally on animal/poultry-linked communicable diseases.

Minimize the threat posed to humans by highly pandemic avian influenza and other zoonoses in domestic poultry

4.2 The project’s focus with regard to this part of the overall objective was on addressing the twin issues of weak or non-existent awareness of HPAI within the population, and the antiquated regulatory environment combined with the very low surveillance capacity of local institutions to detect and respond to a threat in the event that it emerged. The project’s efforts at improving awareness about avian influenza, particularly at farm and household levels, and about the need for proper handling of infected poultry, an important achievement of the project. This was achieved through a variety of means, including advocacy, use of mass media, mobilization of social networks, internal communications within government, building media understanding, and promoting more open and transparent communications from government. The increased awareness was apparent to the mission during a field visit to the west, albeit with a small sample, when it visited a large commercial farm in Shakrinav and small poultry farm households; local people confirmed that they had learned about avian influenza from the project. A Health Knowledge, Attitudes, and Practices survey, undertaken by UNICEF towards the end of the project in 2009, provides data showing that a large percent of respondents (the sample included children, adults, teachers) were aware of avian influenza, and of some of the symptoms. The sample (of 682 adolescents, 682 adults, 248 teachers and 248 health care providers) was drawn randomly from 36 districts and included both men and women in both rural and urban areas.

4.3 Some caveats are worth highlighting concerning the performance of the project in relation to awareness among the population, and thereby minimizing the threat of avian influenza. Firstly, in the absence of a baseline showing the extent to which the population was not aware of avian influenza at the start of the project, it is not possible to get a sense of the scale of impact of the project. As noted earlier, the project missed the opportunity to use the first KAP study of 2006 to set up the baseline.7 Secondly, given that the program was essentially of a short-term emergency nature, there were inevitable gaps in

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7 The first survey in 2006 was designed and executed by a different group from those who did the 2009 survey; it had a different set of questions, and included a sample of 1000 people drawn from seven rural areas (a different target group), since the focus was on a specific group of those who are subjected to the highest risk factors and/or are the least accessible.
awareness building, with fairly large numbers among the population still poorly informed about safe and appropriate practices, for example on the handling of dead birds at home (Table 2). This suggests an unfinished agenda. Given that funding for the program is no longer available, following the closure of the project, sustainability will clearly be an issue.

| Table 2: Actions Respondents would take if they saw a Dead Bird, by Audience Groups (percent of respondents) |
|--------------------------------------------------|----------------|----------------|
| Action                                           | Children (n=682) | Adults-Public (n=682) | Teachers (n=248) |
| Touch it to make sure it is dead                 | 18.2            | 7.8             | 4.8             |
| Pick-up and throw away                           | 31.7            | 39.4            | 25.8            |
| Report to Local Authorities                     | 0.4             | 3.4             | 10.9            |
| Put gloves on, pick-it up and throw away         | 10.1            | 13.2            | 21.4            |

4.4 The project enhanced the planning and coordination capacity of the government and of the animal health institutions to minimize and prevent the threat of HPAI in domestic poultry, in what had been a low capacity environment. While the resources for the compensation fund were reallocated in favor of other activities, following the earlier mentioned commitment from the Government to re-instate the Fund if necessary, procedures for its operation were prepared. However, as avian influenza did not occur, the system for operating the compensation fund (which was exclusively for HPAI) was not tested. The preparation of the National Action Plan for the Prevention and Control over avian influenza brought together the Ministries of Agriculture and of Health, together with their main concerned agencies, as well as a host of other relevant agencies in the country. This clearly improved awareness and capacity within these agencies while considering a program for controlling and responding to the threat of avian influenza. On the regulatory side complementing the National Action Plan, a number of Standard Operating Procedures were also developed under the project, involving various relevant institutions.8

4.5 On the animal health side, the upgrading of the Foot and Mouth Disease Institute laboratory in Dushanbe was a major development, creating technical capacity which had not existed earlier to analyze infectious diseases. This has made a big difference in preparedness, as well as in the quality of research and diagnosis, with old technology and equipment from the 1970s having been replaced. Laboratories in the 4 regions were also upgraded, but it would be fair to say that the focus of the project was on the central laboratory in Dushanbe. The mission visited the central laboratory, as well as one of the regional laboratories in Kurgan Tube, where the project provided equipment was inspected. There is however an issue of sustainability of laboratory activities after the closure of the project on account of the ability of the Government to ensure an

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8 The National Contingency Plan on Prevention and Control of HPAI, standard operating procedures on Laboratory Diagnosis and on HPAI Control, the National Surveillance Plan, the Manual for the training course on differential diagnosis of HPAI, and HPAI Virus Surveillance in Wild Birds.
uninterrupted and adequate supply of reagents to the laboratories. A temporary solution has been found, whereby the FAO has agreed to provide funding for reagents for two years, but the permanent solutions are to be worked out by the Government. Issues of limited budget allocations are also curtailing laboratory activities. For example, the number of tests carried out on avian influenza and Newcastle diseases during 2010 (when the project was still funding laboratory operations) was 1,318, of which 298 samples were from wild birds; in comparison, during 2011, only 530 samples were tested. It is unclear if the reduced scale of testing is due to primarily a reduction in budget resources available to the laboratory, or to fewer suspected disease samples to test.

4.6 The project had a major focus on the training of State Veterinary Department staff responsible for providing veterinary services, thereby improving the capacity of professionals firstly at the center in Dushanbe, and also at both the Oblast and Rayon levels. The focus of the training was on preventing an outbreak among poultry, with the project focusing on improving the capacity in diagnosis and detection. To some extent this may have resulted in the project having a somewhat narrower focus on training and capacity building (primarily on detection), but that was to be expected for a project of this nature, which had an emergency response focus. Also, capacity building at the Oblast and Rayon levels was less than that at the center. Training was provided to specialists responsible for monitoring and reporting.9

4.7 However, the quality and timeliness of reporting is still a weak point, on account of both the fact that prevailing methods at the field level are still using manual systems, necessitating travel and verbal communications (as opposed to computers), and the limitations of budget to always be able to meet the needs of operating costs in a timely manner. The capacity to detect and respond at the field level was enhanced by the creation of working groups at both Rayon and Jamoat levels, which included a minimum of five members representing different specialties (veterinary, sanitary and health, emergency situations, the local administration, and the community), which is the first point of contact in the event of emergencies, and where the first decisions are to be made on actions needed. The field visit to the south (Kurgan Tube) provided an opportunity to confirm, albeit based on paper reports seen, that the groups continue to operate. Overall, while the project improved capacities on various fronts, it is clear that the capacity for surveillance, early detection and emergency responses are limited by inadequate information technology and communication systems, and insufficient human and material resources. Importantly, due to shortage of funds, training has been considerably scaled down after the closure of the project, which will threaten the further improvement of capacity.

4.8 Finally, a major development under the project was the monitoring and surveillance activities of the Institute of Zoology and Parasitology, which monitored the

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9 A meeting with the Epizodic Unit in the State Veterinary Department detailed the reporting timeline. A veterinary specialist at the jamoat level is expected to prepare reports daily, but delivers a report to the Rayon on a monthly basis. The Rayon level staff undertake an analysis of the reports, and submit reports monthly to the Oblasse; this needs to be submitted by the 5th of each of month. The Oblasse is required to submit reports to the Center in Dushnabe by the the 10th of each month. The Center consolidates and submits the reports to the Epizodic Unit by the 15th of each month. The Unit is responsible for submitting reports twice yearly to the OIE. The Head of the Unit confirmed that generally the schedules are being met.
activities of wildlife in a structured manner, focusing on the areas of migratory bird concentration, and collecting blood samples for avian influenza diagnosis. Under the project, 5 monitoring sites were established; these covered the key areas along the routes followed by migratory birds, in the north, central, south and eastern parts of the country. The project contributed also to building capacity within the Institute, improving its preparedness for tracking and catching birds. Following the completion of the project, the limitations of budget have required the institute to curtail the scale of its operations. The focus now is on continuing monitoring along the Afghan border; for the other locations, sporadic monitoring is taking place during the migration periods.

4.9 To summarize, the project did well in taking steps towards getting the population better informed and the key agencies of government more substantively engaged in addressing the threat of avian influenza, which was seen as a serious potential threat at the time of project appraisal. The visits to the laboratories, and to the field where Oblast and Rayon offices as well as farms were visited, confirmed that training was provided to a wide range of staff, and working groups established which provide the first point of engagement in the event of an emergency, and which continue to function after the project ended. This has clearly improved institutional capacity to respond to threats such as avian influenza and other zoonoses in domestic poultry. The field visits confirmed that veterinary staff are monitoring the occurrence of various diseases such as brucellosis, anthrax, and tuberculosis, among others. Unfortunately, there are no data or studies to substantiate the scale of improvement in the services. In the mission’s judgment the achievement of the first objective is rated as Substantial. However, it is important to also point out that sustainability is an issue, as soon after the project closed the scale of activities has declined, reflecting weak arrangements for a transition to local financing of the program.

Prepare for, control, and respond to an influenza pandemic and other infectious disease emergencies in humans

4.10 The scope of activities aimed at addressing the human health part of the project objectives was increased during implementation, as a result of additional resources being reallocated towards it. As summarized below, the main elements of the objectives related to human health – enhancing public health program planning and coordination, strengthening of the national public health surveillance systems, and strengthening health care systems response capacity – were achieved, as evidenced by the successful containment of the influenza virus in the winter of 2009, and of the outbreak of polio in 2010. Over the past two seasons, the system has also responded to the major outbreak of brucellosis. However, the project was implemented in an environment which lacked sufficient number of skilled health professionals at the different levels, and while the project has contributed towards improving the system, a lot is still needed for upgrading the capacity to deal with the various aspects of prevention and control measures.

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10 These were at Kairakum (Sogd Oblast), Nurek (Hatlon Oblast), Kafirnigan (Dushanbe airport), Tigrovaya (Hatlon Oblast), Pyanj (Shugnan rayon).
4.11 The establishment of a bio-security level-2 diagnostic laboratory in Dushanbe has clearly enhanced the capacity of the Sanitary-Epidemiological Service (SES) to identify and manage health emergencies in the country. The laboratory, which was visited by the mission, is capable of providing diagnostic tests for infections other than influenza, and the decision to charge for some of the services rendered to private users does improve prospects for sustainability. On the other hand, the laboratory faces a challenge of being able to procure expensive reagents and related consumables given limitations of public funding, which raises an important issue of sustainability.

4.12 Training for the providers of health services was an important part of the program, including for physicians, epidemiologists, and intensive care unit specialists, on the proper diagnosis and treatment of influenza-like illnesses. This, together with the establishment and training of rapid investigation and response teams, has strengthened the Ministry of Health’s capacity for surveillance and detection, as well as investigation and control of cases not just of avian influenza, but also other infectious diseases that have epidemic potential and pose a risk to public health. The training was complemented with the preparation of standard operating procedures for key activities, among others for dealing with infectious diseases and diagnosing infections, thereby further facilitating the upgrade of procedures and practices. The project also created a good communication tool between the veterinarians and the medical services, by the establishment of working groups in all Rayons; a cell phone messaging system was also developed for medical staff to report occurrence of influenza (or other infectious diseases) to the laboratory in the center.

4.13 In addition, isolation wards were constructed in 3 regional hospitals and the central infectious disease hospital in Dushanbe, following recommendations and standards provided by WHO. Standard operating procedures for Infection control were introduced and staff were trained at hospitals; they were used and tested during the polio outbreak. Similarly, waste management protocols, as well as the incinerators provided under the project were used during the 2010 polio crisis. To complement the above initiatives, an important achievement of the project was the establishment and regular use of the system and protocols for local and international air shipment of samples according to International Air Transport Association regulations for transport of specimens and dangerous goods; capacity at all airports in the country was upgraded for handling specimens, thereby improving overall preparedness to handle emergencies.

4.14 Even though avian influenza was never detected in the country, the capacities created triggered greater attention to, and proved effective in handling threats from communicable diseases. For example, the infectious disease and early detection system proved effective when, after 13 year break, polio reappeared in Tajikistan in early 2010. During 2010 the country reported 711 acute flaccid paralysis cases, of which 458 were

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11 Laboratory biosecurity is the expression used to describe the containment principles, technologies and practices that are implemented to prevent unintentional exposure to pathogens and toxins, or their accidental release; bio security level 4 represents maximum containment.

12 That number of cases in Tajikistan was higher than the number of confirmed polio cases in the rest of the world combined in 2010. The majority of affected people were children under 6 years of age. The most affected areas were the districts bordering Afghanistan and Uzbekistan, as well as Dushanbe and surrounding districts.
laboratory confirmed for wild polio virus; there were over 20 reported deaths, mostly of children. In response, the Ministry of Health, with support from UNICEF, WHO, and other partners, implemented six country-wide vaccination rounds and one sub-national exercise in 2010 as part of a national immunization campaign against polio. About 1.1 million children under 6 received the life-saving oral polio vaccine during the first two rounds, with almost 2.7 million children under 15 years of age vaccinated in four subsequent rounds. The quick and repeated immunization rounds have helped to halt the polio outbreak in Tajikistan. There have been no new laboratory confirmed polio cases in the country since July 4, 2010.

4.15 To summarize, the health system was not really tested for its ability to handle an avian influenza outbreak. However, the proper diagnosis of the H1N1 influenza virus in the winter of 2009 and the rapid containment of the polio outbreak in 2010 are viewed as evidence of the capacity which was built up under the project, to contain outbreaks and reduce incidence of morbidity and mortality. While these outbreaks were not challenges on a similar scale as a HPAI pandemic could have presented, and the building of health systems in Tajikistan remains a work in progress, overall, the project has contributed to a greater professionalization of the health service of the country, and achievement with regard to this part of the objective is accordingly rated as Substantial.

5. Efficiency

5.1 In assessing the benefits of the operation in relation to its costs, it is clearly important in the first instance to recognize the global public good dimension of the project. Through this project, Tajikistan joined a network of various country systems which were strengthened and where poultry disease surveillance capacity has improved. By also improving biosecurity in poultry production systems and vigilance in disease outbreaks, the project contributed to the overall efforts in reducing global risks. Tajikistan also joined a host of other countries threatened by avian influenza in improving reporting of animal health events more promptly to the World Organization for Animal Health (OIE) World Animal Health Information System. This is important, as the virus continues to circulate in many countries of the world, and it will be necessary for the global community to remain vigilant against the threat.

5.2 At the national level, while there was no outbreak of avian influenza, the project has clearly generated benefits for the economy – both from an improved medical support system for the population, and also from a better informed veterinary service, with an improved capacity for surveillance and detection of infectious diseases other than avian influenza (for example, the country suffers from brucellosis and foot and mouth disease, and as noted below, handled a serious outbreak of polio), as well as improved diagnostic facilities at the laboratories that were upgraded. The project took important steps towards improving bio-security in poultry production systems and vigilance for disease outbreaks with animal health systems; however, the efforts initiated under the project need to be sustained to ensure that benefits continue into the future.

5.3 At appraisal, an economic rate of return of 21.3 percent had been estimated, based only on projected incremental benefits arising from reduced poultry losses as a result of the project, excluding any benefits arising from access to better human health care.
Unfortunately, the absence of a relevant baseline and an effective M&E system makes it impossible to better quantify the impacts from the project, and the problems with sustainability since the project closed raise suggest that there would be a declining benefit stream unless they are dealt with.

5.4 In terms of implementation efficiency, there were no overall cost overruns. The closing date extension was largely in order to use resources reallocated from the Compensation Fund. However, there were a number of shortcomings in the efficient implementation of the project, including significant delays in completion of works in the animal and human health laboratories, the regional veterinary laboratories, and the isolation rooms of hospitals. As noted earlier, there were some major discrepancies in goods delivered that did not meet the specifications in the contracts or with missing items, in part due to the lack of technical capacity in the procurement of medical equipment and civil works within the Ministry of Agriculture, home to the PMU. These inefficiencies and the resulting delays were inconsistent with the emergency intent of the operation. Finally, although this multi-donor engagement on the part of the World Bank, FAO, UNICEF, and WHO improved the efficiency of the response through better coordination, there were difficulties in bringing all the contracted UN agencies on board. Overall efficiency is rated as Modest.

6. Ratings

Outcome

6.1 Overall, the outcome for the project is rated as Moderately Satisfactory. The relevance of project objectives to the country’s current development priorities and the Bank’s country and sector assistance strategies is modest, though the relevance of design to the objectives is substantial. Both the objective of minimizing the threat posed to humans by highly pandemic avian influenza infection and other zoonoses in domestic poultry and that of preparing for, controlling, and responding to an influenza pandemic and other infectious disease emergencies in humans were substantially achieved. Efficiency was modest.

Risk to Development Outcome

6.2 The risk to the development outcomes realized under the project is rated as Significant. Three important considerations underpin this assessment. Firstly, the project was focused on addressing issues within the prevailing weak institutional environment, where surveillance and detection capacities, as well as the capacity to diagnose and respond to major outbreaks of diseases, were weak on both the veterinary and human health sides. While the project has made important contributions towards improving institutional capacities and awareness of avian influenza within the population, a three-year program is clearly not enough. The absence of a focused follow-on project to continue the program of capacity building in these areas, beyond the short duration

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13 It is important to note, however, that UNICEF launched some of the activities with its own funds even while the contracting issues were being sorted out.
emergency project, risks compromising some of the achievements. Secondly, the
government faces budget constraints, and continues to rely heavily on external funding to
support development programs. As noted earlier, already in some areas, such as the
surveillance of wild birds, training of veterinarians in the regions, and the operation of the
laboratories, budget constraints are curtailing the scale of activities from the levels which
had prevailed under the project. Thirdly, the institutional arrangements adopted for
implementing the project relied heavily on international technical agencies and a Project
Management Unit that was not fully integrated into the main ministries, thereby
compromising to some extent the nature of involvement of the sector ministries. The use
of multisectoral committees to address some of these issues, while being helpful during
project implementation, has the problem of not providing continuity once project
implementation is completed. This inevitably also compromised sustainability of project
operations.

**Bank Performance**

6.3 **Ensuring Quality at Entry.** The project was part of a region-wide initiative of
the Bank at a time when avian influenza was seen to be a major threat to both the poultry
sub-sector, and to human health too. In this environment, the Bank did well to respond
quickly with an emergency operation, although effectiveness was delayed by three
months. The design of the program, which was following a standard Bank model, was
appropriately targeted at both the veterinary and human health related institutions. This
inevitably added complexity to the design of the project, but it was unavoidable, as
institutions responsible for both aspects faced weaknesses. In addition, given these
institutional weaknesses, the project appropriately co-opted international technical
institutions to help implement the program, in preference to the recruitment of
consultants, even though this may be compromising sustainability in the longer term.
During the country visit for the purposes of this assessment, there were reservations
expressed among some of the agencies on the use of the PMU which is seen to have
compromised to some extent a more direct involvement of the sector ministries, and led
to some inefficiency during implementation. In this regard, it is quite clear that there was
a tension between ensuring rapid project start up and implementation in the face of an
imminent threat in a low capacity environment, and the need to ensure that the
implementation experience gets embedded in ongoing operations of ministries. The one
area of weakness which needs to be noted was the relatively low level of attention given
during project appraisal to designing and setting up of monitoring and evaluation
arrangements, and putting in place a meaningful baseline against which to assess
performance. Both the adoption of the PMU to support project implementation and the
weak arrangements for M&E compromised the sustainability of the project’s outcomes.
Based on these considerations, the quality at entry is assessed as **Moderately Satisfactory.**

6.4 **Quality of Supervision.** The Bank did well in locating task management for
project supervision in the field; this coupled with continuity in the task team leader (the
same person for the entire duration of implementation), enabled a more hands on

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14 The mission did request data on budget allocations for the laboratories, for the period following the
closure of the project, but was unable to obtain them.
engagement in support of project implementation and relatively quick responses to requests from government. Supervision missions were regular, and brought to bear all needed specialists covering both animal and human health aspects of the project. Given that there was no outbreak of avian influenza during the project period, the Bank appropriately responded affirmatively to the Government’s request to reallocate the funds that were intended for a Compensation Fund, to support broader institutional development needs for both veterinary and human health aspects, following a commitment from government that funds would be allocated for compensation, should an outbreak occur. One important area that did not receive the necessary attention of supervision missions was monitoring and evaluation, which appears to have been neglected by the PMU. On account of this, there is little systematic, quantitative information available on the efficiency and efficacy of the project investments. Consequently, the quality of Bank supervision is assessed as Moderately Satisfactory.

6.5 Overall Bank Performance: Moderately Satisfactory

Borrower Performance

6.6 Government Performance. The Government was fully supportive of the program once implementation began. This is reflected by the timely completion of key actions as agreed with the Bank. This included the setting up of a strong multi-agency National Steering Committee under the leadership of the Deputy Prime Minister; upgrading the regulatory framework and creating an enabling environment for the concerned institutions to function and implement the project as designed. The latter included the preparation of a National Avian Influenza Response Plan and the Pandemic Plan, and the development of various Standard Operating Procedures that go with it. The government also demonstrated good commitment by establishing a transparent compensation fund mechanism. The one area of weakness has been the inability to provide sufficient budget resources to the concerned implementing agencies once the project ended to enable continuation of activities and sustain the program of institutional development. On balance, recognizing the low capacity environment and budget limitations which prevail in the country, the performance of the Government is seen to have been Satisfactory.

6.7 Implementing Agency Performance. The project had three main implementing agencies – the PMU, the State Veterinary Department, and the Ministry of Health.

6.8 The Project Management Unit was primarily responsible for project procurement, financial management, and monitoring and evaluation, and performed in a moderately satisfactory manner, recognizing the cross-sectoral complexity of the project. It also helped coordinate the implementation of the Public Awareness building component, for which the primary responsibility was with UNICEF. On the first of the three main areas, the PMU did well in helping project implementation get off to a good start, despite some initial delays in contracting UN agencies. However, there were some serious issues which it had to confront in the procurement of some of the more technical and specialized equipment, particularly with regard to the health component. In this latter area, some procurement actions could have been better managed. The skills available within the PMU were sometimes found wanting, and the project needed the intervention of the
specialist agencies (WHO) to resolve differences of opinion with the Ministry of Health in particular. No major issues were reported with the financial management aspects of its responsibilities. On M&E, however, the PMU was unable to fully deliver on its commitments. Finally, with the Public Awareness component, the PMU played an effective role in facilitating the engagement of various key stakeholders in supporting UNICEF in its implementation.

6.9 The Ministry of Agriculture, primarily the State Veterinary Department, was responsible for implementing the Animal Health component, and did a satisfactory job. It had a complex task to perform under the project, given the prevailing weak capacity, and the need for engagement in some of the less hospitable far flung areas of the country where migratory birds rested. It did well in developing an effective operational partnership between the State Veterinary Department and the Institute of Zoology and Parasitology in migratory bird monitoring. Overall, while the capacity building of the concerned institutions is still work in progress, it is clear that both with the upgrading of the laboratory and the improved monitoring, the overall capacity for surveillance and testing have improved. Also, while budget limitations have forced the Ministry to cut back on many of the project supported activities, the agency is working with the FAO on continuing with the capacity building initiatives following the closure of the project, albeit with a smaller quantum of funds.

6.10 Finally, the Ministry of Health was responsible for implementing the Human Health Component, and also performed in a satisfactory manner. It prepared the National Avian Influenza Pandemic Preparedness Plan, improved staff capacity through a broad ranging training program, and has effectively utilized its strengthened laboratory capacities, introducing partial cost recovery systems. After the completion of the project, WHO has continued its support for the laboratories and for training of MOH staff, albeit, also at a lower level of engagement than was possible under the project. Overall implementing agency performance was Satisfactory.

6.11 Overall Borrower Performance: Satisfactory

Monitoring and Evaluation

6.12 Design. As noted earlier, the appraisal document is unclear on the scope and arrangements for monitoring and evaluation under the project. It was expected that the M&E expert who was to be recruited under the project and located in the PMU would develop an action plan for M&E, including baseline studies, participatory M&E, and a final project evaluation. As a guide, the appraisal document included a results framework with benchmarks related to the drafting of regulations and other important outputs. There were no intermediate outcome indicators, including those related to other zoonoses in poultry and other infectious diseases in humans, that would be useful for measuring the level of preparedness if the avian influenza epidemic did not materialize. At the time of the visit to the country it was not possible to confirm the nature of further work done on the design of M&E within the PMU, including the setting up of a baseline, and no report was available for review.
6.13 **Implementation.** M&E activities under the project focused primarily on input and output monitoring. Essentially, the focus was on monitoring progress against deliverables. This did prove helpful in guiding project implementation, but it would have been important to focus on assessing/measuring the level of preparedness and the ability of the system to bounce back, in response to a renewed threat. The absence of a baseline against which to measure performance, and the focus of data gathering on project outputs, meant that the M&E system did not generate the information necessary for better outcome-related monitoring. For example, there are no data on changes in the timeliness or completeness of surveillance reporting for any of the diseases. As noted earlier, the opportunity to set up the first Knowledge, Attitudes, and Practices survey as a baseline was not taken up at the start of the project.

6.14 **Utilization.** There is little evidence by way of M&E reports prepared under the project that were available at the time of the visit to the country for the purposes of this assessment, to provide any indication about the manner in which M&E related information was utilized under the project.

6.15 **M&E Quality Rating:** Negligible

7. **Lessons**

7.1 The lessons emerging from the experience of the project focus around the challenges going forward, of turning a promising beginning of good cross-sector work, into institutionalized sustained approaches, recognizing that the threat of avian influenza remains, albeit not necessarily in the immediate neighborhood of the country. With a view to draw lessons of experience, it would be appropriate to keep in mind two important perspectives, and their implications.

7.2 Firstly, the project was designed as an emergency response to a perceived threat, but one which had not actually materialized in Tajikistan at the time that the project was appraised. Secondly, the project was designed in a low institutional and human resource capacity environment, where the prevailing systems for surveillance and detection, as well the regulatory environment in the context of managing animal diseases, were old and had not changed much from the Soviet times. In such an environment, it is quite likely that there would be tensions between ensuring rapid implementation start up in the face of an imminent threat in a low capacity environment, and the need to ensure that the implementation experience gets embedded in ongoing operations of ministries, and hence contributes more broadly to building capacity in a sustainable manner.

7.3 **Emergency responses run the risk of low sustainability.** The preparedness built by this emergency operation will be rapidly eroded in the absence of a program (externally or internally funded) that goes beyond the life of the project, for securing the sustainability of preparedness to deal with future outbreaks. Tajikistan was among the poorest of the former Soviet republics, it faced major budget constraints, and development programs have been largely externally funded. In this environment, there is a high likelihood that the government would find it difficult to sustain high budget allocations to sustain operations put in place. As also noted by one of the funding
partners, a transition phase is indispensable for emergency projects which among others, should focus on managerial, institutional, and long-run financial sustainability.

7.4 **The use of a Project Management Unit that is not fully integrated into the main ministries or operational departments runs the risk of compromising country ownership and sustainability.** Clearly the need to get implementation underway quickly weighed heavily on the minds of the appraisal team, given the risks that were clearly there; the use of an existing PMU with the necessary capacity on procurement and financial management did facilitate start up of implementation. However, the arrangement compromised on government ownership, and contributed to some inefficiency in the implementation of components in sectors that had not been the domain of the agriculture sector staff. The issue became more pronounced in this multi-sectoral project, where the PMU was unable to establish effective links equally with both of the main sectoral ministries.

7.5 **The engagement of international organizations to support implementation of the emergency project had benefits in terms of technical rigor, but also potential consequences in terms of reduced ownership.** These agencies provide good cross-country links in situations where an issue straddles national boundaries, and where it is necessary to link up with technical institutions internationally. However, execution responsibilities for components need to be embedded within a government agency. In the case of this project, UNICEF was given responsibility for implementing the component on Public Awareness Building, leaving no government agency that felt ownership for the activities once the project ended, weakening sustainability of the program. The risk of reduced ownership would hold equally in the event that private contractors were enlisted for implementing an emergency operation.

7.6 **Where a project is aimed at mitigating a disease threat with an uncertain probability of occurring, the results framework should cover both scenarios -- when the disease strikes and when it does not.** Intermediate outcomes need to be monitored to assess whether capacity is improving, and whether there are sustainable changes in preparedness, irrespective of whether the threat materializes. Given the prevailing institutional weaknesses, such measures would have been helpful to highlight to policy makers the need for concerted follow up action to ensure sustainability of preparedness.

7.7 **The use of a horizontal Adaptable Program Loan did not pose a problem in the case of Tajikistan, with regard to the choice of component and the use of a common template.** However, that template was geared toward emergency measures for preparedness. Going forward, the challenge for the Government, and also for the Bank as it considers areas of focus in supporting the country, is how to maintain readiness to deal with avian influenza or other emergencies over the longer term in the absence of an outbreak in the immediate future.
References


____. 2011. “Implementation Completion and Results Report on a Grant in the Amount of SDR 3.4 Million (US $5 million equivalent) to the Republic of Tajikistan for a Avian
Influenza Control and Human Pandemic Preparedness and Response Project,” Report No. ICR00001487, Washington, DC.


Annex A. Basic Data Sheet

TAJIKISTAN: AVIAN INFLUENZA CONTROL AND HUMAN PANDEMIC PREPAREDNESS AND RESPONSE PROJECT – P100451(IDA-h2440, TF-57768)

Key Project Data (amounts in US$ million)

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Date of final disbursement: 12/31/2010

Project Dates

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<td>Effectiveness</td>
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<td>Closing date</td>
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### Staff Inputs (staff weeks)

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<th>USD Thousands (including travel and consultant costs)</th>
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<td>FY11</td>
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<td>448.00</td>
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### Bank Lending and Implementation Support Task Team Members

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<thead>
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<th>Names</th>
<th>Title</th>
<th>Unit</th>
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<tbody>
<tr>
<td>Eustacius N. Betubiza</td>
<td>Country Program Coordinator</td>
<td>AFCCD</td>
</tr>
<tr>
<td>Nedim Jaganjac</td>
<td>Sr. Health Spec.</td>
<td>ECSH1</td>
</tr>
<tr>
<td>Jeren Kabayeva</td>
<td>E T Consultant</td>
<td>ECSSD</td>
</tr>
<tr>
<td>Thirumangalam V. Sampath</td>
<td>Consultant</td>
<td>ECSSD</td>
</tr>
<tr>
<td>Daphne Sawyer-R-Dunn</td>
<td>Program Assistant</td>
<td>ECSSD</td>
</tr>
<tr>
<td>John Otieno Ogallo</td>
<td>Sr. Financial Management Specialist</td>
<td>ECSC3</td>
</tr>
<tr>
<td>Fasliddin Rakhimov</td>
<td>Procurement Specialist</td>
<td>ECSC2</td>
</tr>
<tr>
<td>Bobojon Yatimov</td>
<td>Senior Rural Development Specialist</td>
<td>ECSS1</td>
</tr>
<tr>
<td>Alexander Balakov</td>
<td>Procurement Specialist</td>
<td>ECSC2</td>
</tr>
<tr>
<td>Eustacius N. Betubiza</td>
<td>Country Program Coordinator</td>
<td>AFCCD</td>
</tr>
<tr>
<td>Daniel Gerber</td>
<td>Rural Development Specialist</td>
<td>ECSS1</td>
</tr>
<tr>
<td>Bobojon Yatimov</td>
<td>Task Team Leader</td>
<td>ECSS1</td>
</tr>
<tr>
<td>Arcadie Capcelea</td>
<td>Consultant</td>
<td>ECSSD</td>
</tr>
<tr>
<td>Norpulat Daniyarov</td>
<td>Financial Management Specialist</td>
<td>ECSC3</td>
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<tr>
<td>Nedim Jaganjac</td>
<td>Sr. Health Spec.</td>
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<tr>
<td>Jeren Kabayeva</td>
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<tr>
<td>Nino V. Moroshkina</td>
<td>E T Consultant</td>
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<td>Shodi Nazarov</td>
<td>Financial Management Analyst</td>
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<tr>
<td>John Otieno Ogallo</td>
<td>Sr. Financial Management Specialist</td>
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<td>Daphne Sawyer-Dunn</td>
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<tr>
<td>Kathy E. Sharrow</td>
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</tr>
<tr>
<td>Mehrinisso Yuldasheva</td>
<td>Consultant</td>
<td>ECSSD</td>
</tr>
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</table>
Annex B. Background on Influenza and Avian Influenza

**Influenza viruses:** Influenza in humans can be caused by type A, B or C viruses, with the former 2 causing most human infections. Influenza A viruses naturally infect humans, as well as animals such as birds, pigs, and horses, and they generally cause yearly epidemics and, potentially, pandemics. Infections with influenza B virus are generally restricted to humans and cause epidemics more rarely.

**Avian influenza in birds:** Avian influenza is caused by A type viruses that occur naturally among wild birds that usually do not exhibit symptoms. It is very contagious among birds. Infected birds shed the virus in their saliva, nasal secretions, and feces. Domestic birds such as chickens, ducks and turkeys can become infected through contact with infected wild birds, from other infected domestic birds, or through contact with dirt in cages, water or feed that has been contaminated. Infection in domestic birds can result in either a low pathogenic form of the disease which may go undetected because of mild, not very obvious symptoms (such as ruffled feathers or a drop in egg production) or a highly pathogenic form (where multiple organs get affected) that spread rapidly with mortality rates that can reach 90 - 100 percent within 48 hours. An example of the latter is the H5N1 virus. The subtypes differ based on differences in two main proteins on the surface of the virus (hemagglutinin [HA] and neuraminidase [NA]). There are 16 known HA subtypes and 9 known NA subtypes of influenza A virus. Many different combinations of HA and NA proteins are possible. Each combination represents a different subtype.

**Human infections with avian influenza viruses:** The avian influenza virus does not normally infect humans but can infect them if they come in contact with infected poultry or contaminated surfaces. Symptoms in humans range from usual human influenza-like symptoms (e.g., fever, cough, sore throat, and muscle aches) to eye infections, pneumonia, severe respiratory diseases (such as acute respiratory distress), and other life-threatening complications. The symptoms and severity vary depending on the virus type. The highly pathogenic H5N1 virus that has recently been circulating in poultry does not as yet readily circulate in humans. However, where human infections have occurred in contact with infected poultry the virus has been deadly. As of March 16, 2011, the laboratory-confirmed human toll stood at 534 cases, including 316 fatalities, representing a case-fatality ratio of 60 percent.\(^\text{16}\)

**Pandemic in humans with the avian influenza virus:** Annual or seasonal influenza epidemics are caused by the previous seasons’ viruses or by ones with slight antigenic

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\(^{16}\)The actual case-fatality ratio (total number of deaths divided by the total number of cases may be lower because it is likely that the number of deaths is largely accurately counted as autopsies can confirm the cause of death as H5N1, but many mild cases may not be counted as the patients may not visit the doctor or the hospital.
changes. In contrast, a pandemic is caused by an influenza A virus that contains hemagglutinin (HA) for which there is no preexisting immunity, facilitating the virus’s rapid spread throughout the world. Through re-assortment or mutation the virus could become capable of replicating in humans and spreading easily among them. Mutation occurs when a virus changes its genetic makeup allowing it to transmit from person to person, whereas re-assortment occurs when two different viruses exchange genetic material. The re-assortment could happen if animals that are susceptible to both human and avian flu, such as pigs, become concurrently infected with both kinds of flu. The 2009 H1N1 pandemic was caused by a virus that emerged from pigs. H3N2, H1N1, and H2N2 are examples of avian influenza virus types that have, in the past, circulated among humans. Studies confirm that the 1918-19 Spanish flu likely originated from the re-assortment of avian and human viruses. Since the 1918 pandemic, the population of the world has grown 3-fold and a severe pandemic could lead to even more deaths today. The 1957 H2N2 and 1968 H3N2 pandemics also involved new influenza viruses generated by re-assortment events, and, although they were less virulent than the 1918 H1N1 virus, they still caused significant morbidity and mortality. Both of these viruses resulted from re-assortment of a Eurasian wild waterfowl virus with a previously circulating human H1N1 virus.

### Table B.1: The three pandemics of the last century

<table>
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<tr>
<th>Pandemic date &amp; common name</th>
<th>Area of Emergence</th>
<th>Influenza A Virus Subtype</th>
<th>Viral Change</th>
<th>Estimated case fatality rate</th>
<th>Estimated attributable excess mortality worldwide</th>
<th>Age groups most affected</th>
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<tr>
<td>1918-19 “Spanish flu”</td>
<td>Unclear</td>
<td>H1N1</td>
<td>Mutation from avian virus, in HA gene</td>
<td>2-3%</td>
<td>20-50 million</td>
<td>Young adults</td>
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<tr>
<td>1957-58 “Asian flu”</td>
<td>Southern China</td>
<td>H2N2</td>
<td>Reassortment of 3 segments from avian virus (HA, NA, and polymerase protein) in combination with 5 genetic segments of the H1N1 virus</td>
<td>&lt;0.2%</td>
<td>1.4 million</td>
<td>Children</td>
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<td>1968-69 “Hong Kong Flu”</td>
<td>Southern China</td>
<td>H3N2</td>
<td>Reassortment of 2 segments from H2N2 virus replaced by H3 and polymerase protein</td>
<td>&lt;0.02%</td>
<td>1-4 million</td>
<td>All age groups</td>
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</table>


For a pandemic to occur through an avian influenza virus, there would need to be three conditions: (i) a new subtype would have to emerge for which there was little human
immunity; (ii) it would have to infect humans and cause illness; (iii) it would have to spread easily and sustainably among humans. To date the third condition has not been met because the virus has not improved its transmissibility among humans. The concern is that, with some re-assortment of genes (through co-infection with two viruses) or adaptive mutation (that could increase the capability of the virus to bind to human cells), this could occur. Resistance in current virus strains to one of the two classes of available antiviral drugs as demonstrated in vitro has added to anxiety about controlling an endemic if it does occur.

**Figure B.1: Human Cases of the Disease around the World**

Between 2003 and 2008, 47 countries reported the highly pathogenic H5N1 form of avian influenza in their domestic poultry (IFPRI 2008). H5N1 was first seen in a farmed goose in China in 1996 (IMCAPI Hanoi 2010). The first outbreak was recorded in Korea in December 2003 (World Bank 2008). By 2004 the virus had spread to several East Asian countries and by 2006 had reached several Asian, European and Middle Eastern and African countries. Unchecked trade and movement of infected poultry was one of the main triggers behind the spread of the lethal virus (FAO 2006). In the first three months of 2011, Bangladesh, Cambodia, Hong Kong SAR, China, India, Japan, Korea, Myanmar, and Vietnam reported outbreaks. To date the virus has affected 61 countries (Figure 1).
Annex C. List of Persons Met

Ministry of Agriculture
Mr. Imom Abduloev, Head of Virology Department, Kurgan-Tyube, Khatlon oblast
Mr. Mullojon Amirkbekov, Head of the State Veterinary Inspections Services (SVIS)
Muhtor Asrjodov, Chief Veterinarian, Jilikul, Khatlon oblast
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