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NATIONAL ASSESSMENT OF AVIAN AND PANDEMIC INFLUENZA PREPAREDNESS-KINGDOM OF JORDAN

RAISE SPS COUNTRY DIAGNOSTIC REPORT # 27

JANUARY 2007

This publication was produced for review by the United States Agency for International Development. It was prepared by DAI Washington.

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Prepared for USAID under RAISE Task Order 14, “Assistance for Trade Capacity Building in Relation to the Application of Sanitary and Phytosanitary (SPS) Measures”, (Subcontract #4105-99S-006), under, USAID/DAI Prime Contract # PCE-I-00-99-00002-00, “Rural and Agricultural Incomes with a Sustainable Environment (RAISE),” by

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Funded by USAID’s Bureau of Economic Growth, Agriculture and Trade (EGAT) and implemented by Development Alternatives Inc. (DAI), the RAISE SPS Project (“Assistance for Trade Capacity Building in Relation to the Application of Sanitary and Phytosanitary Measures”) is Task Order 14 under the RAISE (“Rural and Agricultural Incomes with a Sustainable Environment”) Indefinite Quantity Contract with DAI as Prime Contractor (Michigan State University, Abt Associates, Winrock International, and Fintrac Inc. are subcontractors). RAISE SPS assists farmers, processors, exporters, retailers and other participants in agribusiness supply chains enhance their competitiveness through achievement of international market standards. Concurrently, RAISE SPS assists regulatory, scientific, technical, and donor institutions better understand the effect of SPS issues and private sector-driven standards on economic growth and poverty reduction. USAID Missions and Bureaus can seek assistance from RAISE SPS by contacting Jim Yazman, USAID/EGAT Cognizant Technical Officer, at jyazman@usaid.gov.

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EXECUTIVE SUMMARY

OBJECTIVES OF THE MISSION

The objectives of this mission were:

- To review the AI/pandemic influenza preparedness plans of both the animal and human health sectors
- To assess the adequacy of:
 - Staff
 - Infrastructure
 - Equipment
 - Laboratory
 - Guidelines
- To assess infection control and poultry vaccination policy
- To review the national committees' structure
- To evaluate surveillance
- To assess stockpiles
- To evaluate the implementation of the communication strategy

METHODOLOGY OF THE MISSION

The mission took place from June 3-15, 2007. In accordance to the tasks specified in the terms of reference, the methodology included:

- Review of documents and reports
- Discussions with government agencies, task forces, and experts in Amman and in the field;
- Field visits and facility assessments in 4 governorates (Amman, Mafrak, Ajloun and Irbid)
- Field visit to commercial poultry farm and to private poultry vaccine manufacturer
- Presentation of the findings of the mission in a formal debriefing with the stakeholders and USAID on June 14th
- Presentation on non-pharmaceutical interventions for all stakeholders and USAID
- Preparation of the mission report.

KEY FINDINGS

Jordan has many strengths that adds to it's over all preparedness to respond to either avian influenza or pandemic influenza. It has a well developed healthcare system with well strained staff. Access to healthcare is good and distances are short, allowing for rapid deployment of PPE, staff etc or the rapid transport of lab specimens to the national reference lab. Healthcare staff have been trained on the management and control of avian influenza and there is a high level of awareness in the general population and an overall willingness to comply with control measures.

The commercial poultry sector is a very sophisticated one and employs up to date bio-security practices. Backyard flocks make up only about 2% of the poultry sector and are currently being vaccinated. The geography of Jordan puts it at lower risk for the introduction of HPAI due to relatively little surface water and migratory bird habitats that are generally located away from areas of intense poultry production.

There are areas that need strengthening. These include the structure of the national committees responsible for preparedness oversight, the preparedness plans themselves, the over all collaboration between the MOH and the MOA, infection control practices in laboratories as well as healthcare facilities, and the significant shortage of nurses as well as PPE and antivirals.

RECOMMENDATIONS

HUMAN HEALTH

- Pandemic Influenza will impact every ministry therefore the responsibility for the national plan should not fall on the MOH alone
- The MOH should commit more human resources specifically for planning and assuring the emergency preparedness of its ministry
- All Healthcare facilities should be surveyed and hospital resource data confirmed
- Coordination and oversight of the national pandemic preparedness plan and response belongs with a disaster management committee and it should:
 - Report directly to the Prime Minister
 - be independent of any one Ministry or stakeholder
 - Must have the commitment and strong political support of top government
 - Have input from all ministries and relevant non governmental entities (i.e., Red Crescent etc)
 - Should be informed by technical working group appointed by the committee consisting of subject matter experts
- Surveillance
 - Expand ILI sentinel surveillance
 - Establish SARI surveillance
 - Strengthen private sector reporting

- Laboratory
 - Improve Infection control
 - Expand surge capacity
 - Develop laboratory network
 - Increase PCR capacity
 - Use King Abdullah University Hospital for training more MOH staff
- Containment
 - Establish guidelines for community containment and external containment
 - Exercise these plans and guidelines frequently
- Surge capacity plans need to be developed for the health care system
 - Ongoing monitoring and updating of preparedness capacity and plans should be instituted
- PPE needs to be decentralized to the local level and supplies need to be greatly increased and used on a regular basis
- Infection control
 - Extensive training needs to be conducted
 - Universal precautions practiced and reinforced in all labs and healthcare facilities
- Communication strategy
 - Emphasis should be placed on hand washing, cough etiquette, and separating sick from well
 - Focus on children, and the high risk (healthcare workers, residents of homes with back yard flocks)
 - Target schools, healthcare facilities and homes with flocks

ANIMAL HEALTH

- Complete the MOA Preparedness Plan and distribute to the Ministries and Governorates
- Appoint a high level individual to oversee combining the resources of MOA, JUST, JVA, JPS and other private sector companies into an efficient, cost effective network of laboratories, services and manpower that can be mobilized on demand (facilitate synergies and minimize redundancies)
- Laboratory Capacity (short term)
 - Expand PCR testing capacity at existing laboratories (MOA and JUST) where infrastructure already exists
 - Fast Track RT-PCR that NTC has already appropriated to JUST
 - Upgrade PCR at MOA Laboratory (maintenance programs, purchase kits, etc.)

- Develop in house PCR methods at MOA Lab to reduce costs
 - Train technicians and emergency responders
- Laboratory Capacity (long term): Build, equip and staff an additional laboratory in the south
- Establish a budget and obtain funding that more realistically supports the needs of the MOA Preparedness Plan
- Restructure the NTC to better reflect the leadership needed for specific activities
- Establish a Compensation Plan with payments guaranteed within a reasonable time period
- Develop a targeted surveillance program using PCR and/or serology where appropriate.
- Develop a communication program that emphasizes:
 - Jordanian poultry products are safe to consume
 - Behavioral changes that provide additional safeguards against food borne pathogens
- MOA launch a nationwide program to educate districts and villagers on clinical signs of AI and the mechanism for reporting suspect cases

BACKGROUND

Highly Pathogenic Avian Influenza strain H5N1 has been reported in most Middle Eastern countries in either wild birds, domestic poultry or human beings. Considering the routes of transmission commonly associated with this virus (e.g., water contaminated with the feces of migratory birds; contaminated equipment and clothing; direct contact between infected dead carcasses, feces and other birds, etc.), it is not surprising that HPAI has spread quickly throughout the Middle East where countries are in close proximity, distances are relatively short and borders are generally quite porous to human and animal traffic. Jordan has been designated one of USAID's 21 high risk countries for avian influenza. This designation was made based on Jordan's shared borders with or close proximity to, multiple countries which have already been infected with HPAI H5N1 (Egypt, Israel, West Bank, Iraq, Saudi Arabia).

In 2006, there were three H5N1 related events reported in Jordan: 1) an imported human case from Egypt which was diagnosed and successfully treated in Karak, 2) an outbreak in a backyard turkey flock in Ajloun which was stamped out with 20,000 birds culled and 3) approximately 30,000 birds culled in the Jordan Valley adjacent to an area of Israel where an outbreak had occurred.

TERMS OF REFERENCE

Assessment of Jordan's human and animal health sectors' preparedness for pandemic influenza—
Scope of work

Activity 1: Meet with relevant contacts in the Ministries of Health and Agriculture, the National Technical Committee, and other public and private sector officials as recommended by USAID

Activity 2: Assessment of Jordan's human and animal health sector preparedness for pandemic influenza that identifies weaknesses in the existing national plan and ways to improve Jordan's preparedness for avian and pandemic influenza that specifically includes:

- Review and verify the preparedness plan
- Assess
 - Health care workers (adequacy of number and training)
 - Infrastructure (referral hospitals and health care centers, number)
 - Equipment (e.g. ventilators, beds, etc.)
 - Lab capabilities (equipment, diagnostic kits, staff, bio-safety, national reference lab, MOA lab, JUST avian pathology lab, JOVAC BSL-3 and private poultry sector labs)
 - Guidelines (case management, hospital infection control)
 - General ability of MOA and private poultry sector to respond to and manage highly pathogenic AI outbreaks
- Review national committees' structure (number and adequacy of involved sectors and partners)
- Interview key stakeholders and assess coordination within the government and with other partners, countries and international agencies
- Evaluate human surveillance, early warning and rapid response
 - Capability of the surveillance system to detect and rapidly respond to a pandemic
- Evaluate MOA vaccination and surveillance policies
- Assess stockpiles (antiviral drugs, personal protective equipment, vaccines, protocols, prioritization and logistics for distribution)
- Evaluate implementation of the communication strategy

METHODOLOGY OF ASSESSMENT

The mission took place from June 3-15, 2007. In accordance to the tasks specified in the terms of reference, the methodology included:

- Review of documents and reports;
- Interviews with MOH
 - Disease Control and Surveillance
 - Disaster Management
 - Governorate level AI referral hospital and health center
 - Health Directorates
 - Laboratory
 - Central stores
- Interviews with other human health stakeholders
 - National Technical Committee
 - Jordan University of Science and Technology (JUST)- King Abdullha University Hospital- AI referral hospital
 - CDC
 - WHO
 - UNICEF
 - Johns Hopkins
- Interviews with MOA
 - Poultry division
 - Laboratory
- Interviews with other animal sector stakeholders
 - Poultry integrators
 - Veterinary Association
 - University
 - Vaccine Manufacturer

- Field visits and facility assessments in 4 Governorates (Amman, Mafrak, Ajloun and Irbid)
- Field visit to commercial poultry farm and to private poultry vaccine manufacturer
- Presentation of the findings of the mission in a formal debriefing with the stakeholders and USAID on June 14th
- Presentation on non-pharmaceutical interventions for all stakeholders and USAID
- Preparation of the mission report.

LIMITATIONS OF THE ASSESSMENT

- Short period of time
- Inability of consultants to speak or read Arabic (some documents were only in Arabic and some interviews were conducted using an interpreter)
- Conflicting or inconsistent data (especially in terms of number of hospital beds, staff, ICU beds and ventilators)
- Unable to interview the MOH department specifically responsible for hospitals

PUBLIC HEALTH SECTOR ASSESSMENT

The Kingdom of Jordan has a number of strengths that will assist the country's ability to respond to either human avian influenza or the next pandemic.

The Minister of Health is a trained epidemiologist, understands the issues involved in mounting an effective response and is committed to making sure that Jordan is prepared. On top of this, he has a number of very competent, dedicated staff in the key offices to be called upon during an outbreak or pandemic.

The general training for both physicians and nurses is high quality which has been both a blessing and a curse. Because the quality of training is so high, physicians and nurses are able to secure employment in the Gulf States, the UK and the USA where salaries are significantly higher. This has caused national shortages, especially among nurses. The 2 university hospitals, both of which are AI referral hospitals, are very high quality, sophisticated facilities equaling any here in the U.S. Because Jordan is geographically small, there is good accessibility to health care through out the country (no more than 30 minutes walking) and the central government can reach any part of the country within 6 hours making it easy to quickly deploy staff, PPE etc. from Amman.

The public as a whole appears to have a high level of awareness about avian influenza and there is a lot of community willingness to assist and comply during times of need. This was demonstrated during the outbreak of H5N1 last year in Ajloun.

And finally, as will be detailed in the animal health section of the report, there is a relatively low risk for endemicity of H5N1 in the poultry.

When the imported human case of H5N1 arrived from Egypt, he was identified immediately as a suspect case and the MOH was notified and specimens were sent to the national reference lab, treatment was started and control measures instituted. The patient recovered. The system worked well in this case.

COORDINATING MECHANISMS

There are three significant national committees set up to deal with avian and pandemic influenza. The first, the National Steering Committee, is chaired by the Minister of Health, and is staffed by members of most government ministries; the second, the National Technical Committee (better known as the NTC) is a group of technical people from both the public and private sector who inform and provide technical guidance to the National Steering Committee. This committee is also chaired by the Ministry of Health. The third committee is the Disaster Management Committee (also called The Higher Council of Civil Defense) which has a focal person from each and every ministry and is headed by the Minister of Civil Defense.

Of Concern with both the National Steering Committee and the NTC is that the role of leadership falls squarely on the MOH. The next pandemic, if severe, will impact each and every sector of the government and society and should not be viewed as the responsibility of the MOH alone. Furthermore, the MOH, as the chair of the Steering Committee, does not have authority over the other Ministries who sit on the committee as they are equals in the government organogram.

There is a longstanding lack of coordination and trust between the MOH and the MOA which has lead to tensions and interfered with collaborative effective team work. The roles and responsibilities of the 2 ministries still have not been clearly delineated.

The NTC, at its inception, was productive, proactive, dynamic and motivated. There were sub-committees formed to work on case management, communication and other sub-tasks. However, this group seems to have lost significant momentum over the last year and now only meets sporadically. Membership in this group has not been consistent and did not always include most technically relevant staff on it's committees. A number of key activities remain unfinished such as:

- Panflu preparedness plan was last worked on 11/06
- Budget not yet completed or approved
- Proposed hospital preparedness survey not yet started
- Communication sub-committee last met 9/06
- Communication strategy not completed
- Lack of political support for sub-committees

Ultimately this group became too large and unwieldy to operate efficiently and has pretty much ceased to function.

In their 2003 national comprehensive plan, the Disaster Management Committee has included "diseases and epidemics" as part of their purview but have done little to detail and flesh out a plan specifically for this purpose. There is only 1 member from the MOH on this committee and he also serves as the full time director of occupational health for the MOH and has no other support from within the ministry. The national contingency plan is very vague and does not include any of the necessary detail required to respond efficiently and effectively to a pandemic.

All these national groups fall under the leadership of one of the ministries rather than being placed above the ministry level in an independent position with the necessary authority and political support to do the job at hand.

SURVEILLANCE

The MOH has a national list of required reportable diseases which is adhered to by the public sector but not by the private sector. Despite poor regular reporting by the private sector, the MOH feels that they can be relied upon to report the most serious reportable diseases. Reporting is done using weekly electronic reporting unless a serious condition, requiring an immediate public health response, is identified. The MOH has the capacity to receive emergency reports by phone, 24/7.

Laboratory surveillance is being rolled out as the government labs are being strengthened but private laboratories do not currently report. ILI surveillance has been instituted in 2 sentinel sites, with good success, but incentives have been provided and these incentives are expected to run out soon. There is the desire to rollout the ILI system but no definitive plan has been developed. SARI surveillance is in the process of being set up with the assistance of NAMRU 3 in Cairo. These are key components to an influenza surveillance system and leadership for these initiatives will be critical.

The MOH is part of a cross border surveillance initiative that includes Israel and Palestine. The current director of surveillance is a strong competent leader as is demonstrated by the current level of communicable disease surveillance in Jordan and the work being done to improve surveillance.

HOSPITAL FINDINGS

Jordan has several extremely sophisticated university based hospitals, both of which collaborate closely with the ministry of health while some of the government hospitals are old and in need of repair and are short of supplies. Clear data is lacking on the total number of beds, supplies, etc but a comprehensive hospital survey is being planned for the near future. There is wide variation in the figures depending on their source.

Currently in Jordan there are:

- 98 Hospitals
 - 29-ministry of Health
 - 11-Royal Military Service (RMS)
 - 2-University
 - 56-private
- 425 Health Centers (all MOH)
 - 57- comprehensive
 - 368- primary

There are 19 hospitals that have been designated AI referral hospitals scattered throughout the country. These hospitals have received extra training on the identification, case management and control of avian influenza.

Using the following assumptions:

- The first wave of the next pandemic will last 8 weeks and will have a 25% attack rate
- The population of Jordan consists of
 - 3 million 0-19 year olds
 - 2.4 million 20-64 year olds
 - 300,000 65+ year olds

- There are 10,000 non ICU beds available, 500 ICU beds and 1,500 ventilators available (data provided by the MOH)

I have calculated (using FluSurge) the following scenarios for Jordan based on models using a moderate pandemic (1957, 1968 type scenario) and a severe pandemic similar to that of 1918:

Scenario	1957-1968	1918
Total deaths	2,150	17,669
Total hospitalizations	12,485	90,254
Max % hosp capacity needed/wk	18%	186%
Max % ICU capacity needed/wk	105%	1080%
Max % usage of vents/wk	17%	126%
Max # of flu deaths in hosp/wk	286	2350

HUMAN AND HOSPITAL RESOURCES

As mentioned earlier, Jordan has high quality training for both its physicians and nurses. Training is based on common models used in the west and many of the physicians have received training in the UK and US. Nursing school consists of 4 years of college level training and graduates are often able to secure employment in the Gulf, the UK or the US.

While data varies according to the source, the most consistent data shows Jordan to have the following level of resources:

- 1 MD/475 people (12,800-total)
- 1 RN/335 people (17,000- total)
- 0.63 RNs/hospital bed
- 1 hospital bed/533 people (10,000-total)

To put this into some perspective, for Australia, a doctor/patient ratio of less than 1:1400 is considered good and in other developed countries the ratio is even higher. However, it is clear that with only 0.63 nurses per hospital bed, Jordan suffers from a significant shortage of a critical group of healthcare workers. Even if all the nurses in Jordan could be counted on to work only in hospitals, there still would be a shortage in hospitals.

LABORATORY

The underlying capacity to respond to avian or pandemic flu exists in Jordan but needs to be improved. Currently there is only one MOH laboratorian trained to do RT-PCR; two others can run RT-PCR but only with supervision. The current load is not yet large enough to overwhelm the system; a total of 53 human and animal specimens were run over the last year and a half.

The King Abdullah University Hospital (KAUH) has an extremely sophisticated lab which can produce its own primers for PCR and which trains lab students enrolled at JUST. KAUH works

closely with the MOH and has offered to train MOH staff on the use of real-time RT-PCR as well as regular PCR.

During last year's turkey outbreak and identification of the human AI case, rapid tests were used in the field. There were conflicting data as to whether the H5 specific rapid test was used or whether the A/B rapid flu kit was used. Regardless, the human and turkeys tested negative using the rapid test but were later confirmed by the national reference lab using real-time RT-PCR as being positive for H5N1.

There are several non-MOH laboratories that are capable of running real-time RT-PCR for H5N1 specimens, but it was agreed that the national MOH lab would serve as the national reference lab. Specimens can be transported from just about any location within Jordan in 6 hours or less so the need for a lot of regional or local labs is not necessary.

INFECTION CONTROL

The over all healthcare system in Jordan has a lot of strengths but unfortunately infection control is not one of them. During my visits to both MOA and MOH laboratories, hospitals and health centers, I did not observe a single staff person washing their hands or using gloves, even while handling or processing blood specimens or providing direct care for patients. There was no evidence of any gloves being out on counters or being easily accessible to healthcare workers. When asked if they had any gloves, they were able to produce one box of very poor fitting, low quality plastic gloves that were kept in a drawer in a back room.

The only evidence of infection control was at the KAUH where we saw a patient with chickenpox who had been placed on airborne precautions and was being kept in a negative pressure room.

All AI referral hospitals we visited (both private and public) had developed plans for isolating H5N1 or pan flu cases. They had identified wards that could serve for overflow or for the cohorting of patients if needed.

PERSONAL PROTECTIVE EQUIPMENT (PPE)

PPE is in short supply in Jordan and is not regularly used for non- influenza patients. Universal precautions are not being used. There is a limited supply of both PPE and Tamiflu that the MOH keeps in Central Stores in Amman which can be distributed rapidly. Recently, some stores were pre-positioned at some of the health directorates within the governorates but are to be used for emergencies, not for everyday use.

Currently there are only 7,000 N95s available and yet there are more than 12,800 physicians and 17,000 nurses. There are just over 5,000 courses of Tamiflu tabs available and if we were to see a 1918-like scenario, Jordan could expect to have over 90,000 patients hospitalized with influenza and numerous staff requiring potential prophylaxis.

COMMUNICATION

A communication strategy was developed last year but due to the de-motivated sub-committee of the NTC, was never moved forward and implemented. UNICEF and Johns Hopkins have since assumed responsibility for the strategy and a draft report was submitted for internal review just before we left.

There was a lot of anger on the part of the commercial poultry suppliers towards the MOH because they felt that the health messages that had gone out during the turkey outbreak in Ajloun had been responsible for the large decrease in chicken sales and the ruin of several commercial poultry farmers.

RECOMMENDATIONS

- Pandemic Influenza will impact every ministry therefore the responsibility for the national plan should not fall on the MOH alone
- The MOH should commit more human resources specifically for planning and assuring the emergency preparedness of its ministry
- All Healthcare facilities should be surveyed and hospital resource data confirmed
- Coordination and oversight of the national pandemic preparedness plan and response belongs with a disaster management committee and it should:
 - Report directly to the Prime Minister
 - be independent of any one Ministry or stakeholder
 - Must have the commitment and strong political support of top government
 - Have input from all ministries and relevant non governmental entities (ie Red Crescent etc)
 - Should be informed by technical working groups appointed by the committee consisting of subject matter experts
- Surveillance
 - Expand ILI sentinel surveillance
 - Establish SARI surveillance
 - Strengthen private sector reporting
- Laboratory
 - Improve Infection control
 - Expand surge capacity
 - Develop laboratory network
 - Increase PCR capacity
 - Use King Abdullah University Hospital for training more MOH staff
- Containment
 - Establish guidelines for community containment and external containment

- Exercise these plans and guidelines frequently
- Surge capacity plans need to be developed for the health care system
 - Ongoing monitoring and updating of preparedness capacity and plans should be instituted
 - A human resource development plan needs to be developed to address the nursing shortage
- PPE needs to be decentralized to the local level and supplies need to be greatly increased and used on a regular basis
- Infection control
 - Extensive training needs to be conducted
 - Universal precautions should be practiced and reinforced in all labs and healthcare facilities
- Communication strategy
 - Emphasis should be placed on hand washing, cough etiquette, and separating sick from well as well as safe food/poultry handling practices
 - Focus on children, and the high risk (healthcare workers, residents of homes with back yard flocks)
 - Target schools, healthcare facilities and homes with flocks

ANIMAL HEALTH SECTOR

SUMMARY

In 2006, Jordan was confronted with three H5N1 related events: 1) an outbreak in a flock of backyard turkeys in Ajloun, 2) H5N1 diagnosed and treated in a new arrival from Egypt and 3) depopulation of birds in the Jordan Valley adjacent to an area in Israel where H5N1 was reported. In each of these instances, authorities responded quickly and effectively to limit the damage; however, in so doing, certain weaknesses were highlighted in the system that should be corrected to safeguard the country against more serious threats in the future.

Major sections of the Animal Health National Preparedness Plan are incomplete, diagnostic laboratory capacity is lacking, and trained laboratory personnel and emergency responders are in short supply. Exacerbating these problems is an unhealthy and counterproductive rivalry between the Ministries of Health (MOH) and Agriculture (MOA) for resources and influence over policy. However, despite these problems, there is reason for optimism with respect to the future and Jordan's ability to respond to the threat of AI. There exists a strong private poultry sector with significant resources; laboratory equipment and trained personnel that are scattered throughout various MOA, university and private sector institutions can be coordinated to provide emergency surge capacity; and the country's geography and cultural practices are not completely hospitable to the virus and its common modes of transmission. With responsible leadership, some increased funding for preparedness and competent technical assistance, Jordan can develop a cost-effective, comprehensive program that offers real protection against the threat of AI.

CURRENT STATUS OF AI IN THE COUNTRY

RECENT OUTBREAKS

Highly Pathogenic Avian Influenza strain H5N1 has been reported in most Middle Eastern countries in either wild birds, domestic poultry or human beings. Considering the routes of transmission commonly associated with this virus (e.g., water contaminated with the feces of migratory birds; contaminated equipment and clothing; direct contact between infected dead carcasses and other birds, etc.), it is not surprising that HPAI has spread quickly throughout the Middle East where countries are in close proximity, distances are relatively short and borders are generally quite porous to human and animal traffic. In 2006, there were three H5N1 related events reported in Jordan: 1) a new arrival from Egypt was diagnosed and treated successfully, 2) an outbreak in a backyard turkey flock was stamped out with 20,000 birds culled and 3) approximately 30,000 birds were culled in the Jordan Valley near an area of Israel where an outbreak had occurred.

POULTRY PRODUCTION

Jordan's poultry sector has the following approximate composition:

Type	#Birds	#Farms	Comments
Broilers	173,000,000/year	2020	30 million/cycle
Broiler Breeders	1,800,000	104	
Broiler Grandparents	140,000	2	
Layer Breeders	90,000	4	
Layers	5,000,000	310	
Backyard	500,000	N/A	

The six largest companies are responsible for more than 50% of commercial production, and backyard flocks comprise less than 2% of the total population and are in decline. The March 23, 2006 outbreak in backyard turkeys caused several medium and small commercial producers to discontinue operations as they could not withstand the collapse in demand and pricing. Now that both demand and prices are in excess of the pre-outbreak levels, the largest integrators have established an even more dominant position relative to total production.

OUTLOOK

Notwithstanding the obvious threat posed by HPAI in neighboring countries, if the proper initiatives are undertaken, Jordan can position itself quite well to avert a widespread avian influenza outbreak:

- As large integrators with more stringent bio-security practices increase their market share at the expense of smaller companies, there are correspondingly better management systems in place for monitoring AI and containing outbreaks.
- Most of Jordan's migratory bird habitats are around the Gulf of Aqaba and in the Jordan Valley away from regions where intensive poultry farming occurs.
- Jordan's hot, dry climate does not favor virus viability, and most water for commercial poultry is derived from underground sources.
- Although backyard flocks do exist in low numbers (2%), live bird trading markets are not commonplace as live poultry is forbidden in the larger towns and cities.
- Jordan's population is knowledgeable about avian influenza and the potential hazards it poses to human health.
- There is considerable infrastructure and technical expertise within the country to form the basis of a comprehensive preparedness plan.

PREPAREDNESS PLAN

Two documents were provided by the Ministry of Agriculture as evidence of its National Preparedness Plan:

- National Contingency Plan for Avian Influenza
- PART 1: POLICY DOCUMENT (03 October 2006)

- National Contingency Plan for Avian Influenza
- PART 2: MANUAL OF STAFF INSTRUCTIONS (05 October 2006)

Although these documents were structured to be consistent with an OIE and EU template, many sections were incomplete and required more detail with respect to:

- Organizational Chart for Emergency Response
- Defined Responsibilities
- Emergency Contact List (Laboratory, Veterinary and Administrative Support Personnel)
- Implementation Details
- Compensation Plan
- Training
- SOP for Diagnosis of AI (processing samples)

Considering that eight months have elapsed since the last revision and such major sections remain unfinished suggests that MOA is either not prioritizing this undertaking or there are insufficient qualified personnel available to complete the task. Completion of the documents should be given high priority. In particular, a compensation plan is needed urgently. There was no compensation plan established prior to the March 23, 2006 outbreak in backyard turkeys in Ajloun. According to sources in Ajloun, villagers had to wait up to six months before compensation was received. With AI surveillance so dependent on the vigilance and transparency of backyard flock owners, delayed compensation and the economic hardship that often results is counterproductive. High priority should be attached to establishing an equitable and responsive compensation plan that encourages timely reporting of suspect AI outbreaks.

COORDINATION

MINISTRY OF AGRICULTURE

The newly constructed MOA central laboratory is the primary government facility for performing poultry diagnostics. The facility is equipped to perform standard serology, histopathology, PCR and virus isolation although there is no BSL-3 facility for isolating H5N1. Smaller laboratories exist at most of the governorates but their capabilities are limited to necropsies and some routine diagnostic testing.

The central laboratory has both conventional and real time PCR as well as some trained laboratory personnel. However, due to a limited budget, equipment maintenance programs have suffered, and there is a shortage of kits which are expensive and often expire before being used.

UNIVERSITY

PCR capabilities and trained personnel also exist within the Avian Pathology Department at the Jordan University of Science and Technology (JUST). Prof. Dr. Saeb N. El-Sukhon (Dean, Faculty of Veterinary Medicine) specifically requested that the university be considered a willing participant in any effort to unify and expand Jordan's diagnostic laboratory capabilities for avian influenza.

Unofficially, the Dean has previously committed to dedicating additional laboratory space, freezers, trained personnel, etc. specifically for avian influenza testing. Although NTC authorized the purchase of an additional PCR for JUST more than one year ago, the equipment has yet to be received.

PRIVATE SECTOR

In discussions with private sector stakeholders including JPS (Dr. Yasin Amro and Mousa Wakileh), JVA (Dr. Abdel Fattah Kilani) and Jordan Vaccine Laboratory (Dr. Talal J. Nasser), a commitment was expressed to contribute whatever resources are needed to safeguard their industry and the country. While these commitments would likely come with certain conditions attached, they do represent a valuable resource for satisfying short and medium term preparedness objectives while operating under a limited budget:

- Most large private poultry integrators maintain in house diagnostic laboratories with trained personnel and equipment. To the extent that these facilities could be upgraded and made available during major outbreaks, the government would have a cost-effective mechanism for providing laboratory surge capacity.
- A significant part of JVA's membership works in the poultry sector. While many of these veterinarians are not specifically trained for emergency response, they do represent a reservoir of talent that can be trained and mobilized to control an outbreak.
- For the March 23, 2006 outbreak, H5N1 virus isolation was performed in the BSL-3 facility operated by the Jordan Vaccine Laboratory (JOVAC). With ongoing access to this facility, the government could maintain H5N1 virus isolation capabilities without incurring the expense associated with new construction.

The aforementioned infrastructure resources are available, and with the appropriate government incentives, they can be woven into a nationwide network of laboratories and personnel capable of providing surge capacity in the event of an outbreak. Currently, there is no committee or leadership position charged with administering an initiative of this type.

VACCINATION/SURVEILLANCE

VACCINATION

The current MOA policy is to vaccinate all backyard birds with H5N2 and leave all the commercial birds unvaccinated. Overall, this policy is a sensible one considering the poultry industry in Jordan (commercial versus backyard) and the extent of the AI threat.

The generally accepted benefits of vaccination are that it: 1) increases the threshold for infection in the most vulnerable population of birds (backyard) and 2) decreases viral shedding and reduces human exposure.

The downside to vaccinating is that it places additional demands on surveillance programs due to:

- Infected vaccinates may not exhibit obvious clinical signs; therefore, mortality is no longer a reliable method for surveillance.
- Complete vaccination compliance is difficult to achieve

- Sentinel birds are not possible
- Without proper surveillance, low levels of H5 could be shed into the environment undetected.

SURVEILLANCE

The MOH and MOA have a major disagreement with respect to surveillance and what constitutes an acceptable program. According to MOA's numbers, between 10 and 15% of poultry farms are visited monthly and monitored for mortality. If more than 10% mortality is noted in a flock, a more extensive diagnostic workup is conducted (Rapid Test, PCR, serology, etc.). MOH believes this level of surveillance and the methods employed are insufficient.

While MOA's numbers are impressive, they are inflated by the number of commercial farms visited—the least likely source of an unreported outbreak. More appropriately, surveillance, using PCR and serology if applicable, should target high risk populations such as: 1) migratory birds especially where there is significant mortality, 2) backyard flocks near migratory bird habitats and 3) small farms and backyard flocks where monitoring is less reliable. With a more focused approach to surveillance, the number of sites visited will likely decrease while detection capabilities are enhanced.

COMMUNICATIONS

During and subsequent to the H5N1-related events of 2006, there was considerable disagreement between MOH, MOA and the private poultry stakeholders concerning the message that should be delivered to the public about avian influenza and the associated human health issues. The end result was a series of conflicting messages delivered through the media that confused the public. The private poultry integrators sponsored advertisements that downplayed the zoonotic potential while the MOH message emphasized avoiding contact with sick birds and was thought by JPS to be responsible for the dramatic decline in poultry consumption during and immediately after the outbreak.

Although framing the government's message was hugely important at the time of the outbreak, the issue has a lower profile currently as demand and pricing for poultry products now exceed pre-outbreak levels. Nonetheless, the issue remains unresolved, and it is important in preparing for the next outbreak. The public requires accurate information during an outbreak so that: 1) suspect flocks are reported promptly, 2) suspect cases in humans seek and receive appropriate medical care, 3) proper personal hygiene practices are implemented especially among poultry owners and workers and 4) consumption of poultry does not collapse unnecessarily.

Both MOH and JPS seem to have learned from the events of 2006. During this period of relative calm, all parties need to agree on the mechanisms that will be employed in delivering a coherent and consistent message to the public during and immediately after an outbreak.

RECOMMENDATIONS

- Complete the MOA Preparedness Plan and distribute to the Ministries and Governorates
- Appoint a high level individual to oversee combining the resources of MOA, JUST, JVA, JPS and other private sector companies into an efficient, cost effective network of laboratories services and manpower that can be mobilized on demand (facilitate synergies and minimize redundancies)
- Laboratory Capacity (short term)

- Expand PCR testing capacity at existing laboratories (MOA and JUST) where infrastructure already exists
- Fast Track RT-PCR that NTC has already appropriated to JUST
- Upgrade PCR at MOA Laboratory (maintenance programs, purchase kits, etc.)
- Develop in house PCR methods at MOA Lab to reduce costs
- Train technicians and emergency responders
- Laboratory Capacity (long term): Build, equip and staff an additional laboratory in the south
- Establish a budget and obtain funding that more realistically supports the needs of the MOA Preparedness Plan
- Restructure the NTC to better reflect the leadership needed for specific activities
- Establish a Compensation Plan with payments guaranteed within a reasonable time period
- Develop a targeted surveillance program using PCR and/or serology where appropriate.
- Develop a communication program that emphasizes:
 - Jordanian poultry products are safe to consume
 - Behavioral changes that provide additional safeguards against foodborne pathogens

MOA launch a nationwide program to educate districts and villagers on clinical signs of AI and the mechanism for reporting suspect cases

ANNEX 1: PERSONS INTERVIEWED

Date	Name	Title	Institution
04-Jun	Dr Adel Belbisis	Asst. Sec. General for Primary Care	MOH
	Dr Aktham Hadadin	Lab Director	Laboratory Directorate
	Dr Bassam Hijawi	Disease Control Director	MOH
	Dr Raja Hadadin	Dep. Dir. Disease Control Directorate	MOH
	Dr Neyla Gargouri	Head of Surveillance Dept.	MOH
	Dr Mohannad Nsour	Head of FETP/Surveillance Dept	MOH
	Dr Mohammad Abdullat	Head of Infec. Control section/Surveillance	MOH
	Dr Sami Sheikh	Head of Emerging Diseases Section/Surveillance	MOH
	Dr Bashar Barqawi	FETP resident zoonotic diseases	MOH
	Dr Ali Arbadji	Project Management Specialist	USAID
	Dr Russ Gerber	Resident Advisor	US CDC
	05-Jun	HE Dr Sa'ed Kharabsheh	Minister of Health
Dr Ali Assad		Undersecretary for Technical Affairs	MOH
Dr Jeannette Mirza		Undersecretary for Administrative Affairs	MOH
Dr Salwa Batir			USAID
Dr Ali Arbadji		Project Management Specialist	USAID
Dr Bashar Barqawi		FETP resident zoonotic diseases	MOH
Dr Neyla Gargouri		Head of Surveillance Dept.	MOH
Dr Adel Belbisis		Asst. Sec. General for Primary Care	MOH
Dr Nathir Obeidat		Pulmonologist/member of Nat. Tech. Committee	Jordan University
Dr Azmi Mahafza		Virologist/member of Nat. Tech Committee	Jordan University
06-Jun	Dr Mustafa	Dep. Dir. Of Mufrak Health Directorate	MOH
	Dr Suliman	Dir. Of Mufrak Health Directorate	MOH
	Dr Muhammed Abu-Khudair	Head of Surveillance Dept./Mufrak Health Directorate	MOH
	Dr Diafaallah Husban	Dir Of Mufrak Government Hospital	MOH
	Staff	Primary Health Care Center/Mufrak	MOH
		Director	Al-Jazeera Poultry Company
	Eng. Khaled Rahahleh	Feed Mill Manager	Al-Jazeera Poultry Company
	Dr. Sultan Jazi	Veterinarian	Al-Jazeera Poultry Company
	Dr Ziad Faz	Head of Poultry Health Division	MOAG
	Dr Bashar Barqawi	FETP resident zoonotic diseases	MOH
	07-Jun	Dr Naser Hawarnedeh	Director Of Animal Wealth Directorate
Dr Ziadoun Saleh Hijazeen		Poultry Pathologist	MOAG
Dr Hisham Musa Al Maaitak		Head of Central Laboratories/Assist. Of Laboratoriate Directorate	Laboratory Directorate

Date	Name	Title	Institution
	Dr Suzan Abu-Asheikh	Poultry Division	MOAG
	Dr Mansour	FAO Representative	FAO
	Dr Ziad Faz	Head of Poultry Health Division	MOAG
	Dr Bashar Barqawi	FETP resident zoonotic diseases	MOH
	Dr Mohammad Turke	Focal point for Disaster Mangmt/Dir of Occupational Health	MOH
10-Jun	Dr` Rafiq Saleh	PHL Director	MOH
	Dr Aktham Hadadin	Lab Director	MOH
	Dr Tarek Al-Sanouri	Microbiology lab director	MOH
	Dr Mustaffa	Deputy Manager of PCR lab	MOH
	Dr. Yasin Amro	National Poultry Company Veterinarian	Pvt poultry industry
	Mousa Wakileh	Majority Owner (65%) of AL-AHLIA Poultry Company	Pvt poultry industry
	Dr. Talal J. Nasser	Owner	Jordan Bio-Industries Center
	Dr. Nadim Mukhles Amarin	Poultry Vaccine Technical Executive	Boehringer Ingelheim
	Dr. Abdel Fattah Kilani	President of JVA	Veterinary Association
	Dr Adel Belbisis	Asst. Sec. General for Primary Care	MOH
11-Jun	Dr Hameed	Assistant Dir of Ajloun health directorate	MOH
	Dr Taiseer	Head of Surveillance- Ajloun health directorate	MOH
		Dir of Ajloun Gov Hospital	MOH
	Dr Ahamad Alqda'a	Assist. Dir of Ajloun Gov Hospital	MOH
	Dr Ebtسام	Dir of Services- Ajloun Hospital	MOH
	Ajloun hospital staff	members of the quality assurance and infection control dept	MOH
12-Jun	Dr. Saad Gharaibeh	Faculty Veterinary Medicine, Avian Pathology	JUST
	Dr. Saeb N. El-Sukhon	Dean, Faculty of Veterinary Medicine	JUST
	Dr. Ahmad M. Al-Majali	Associate Professor, Infectious Disease/Zoonosis, Vet Med	JUST
	David L. Piet	Population and Family Health Office	USAID
13-Jun	Faisal A. Dayem	General Manager	JOVAC
	Fuad Aldomy	Animal Health Technical Advisor	JOVAC
	Dr. Hashim A. Elzein Elmoussaad	Representative for Jordan and Head of Mission	WHO

ANNEX 2: ITINERARY OF MISSION

Assessment o Jordan AI Preparedness Plan Jordan, June 4-17, 2007 Provisional Agenda

Mon. June 4/07	9:00-10:00	Meeting with Deputy Secretary General for Primary Health Care <ul style="list-style-type: none"> • Welcome & introduction • Mission objectives
	10:00-11:00	Primary health care system in Jordan
	11:00-11:30	Surveillance & control of infectious diseases
	11:30-12:00	Hospital infection control
	12:00-13:00	Jordan Influenza Preparedness Plan
	13:00-15:00	Lunch break
	15:00-17:00	Meeting with CDC resident adviser and Field Epidemiology Training Program counterpart
Tue. June 5	9:00-10:00	Meeting with H.E. the Minister of Health & Secretary General for Technical Affairs (To be confirmed)
	10:00-13:00	Meeting with National Technical Committee members
	13:00-15:00	Lunch break
	15:00-17:00	Meeting with National Case Management Committee members
Wed. June 6	9:00-13:00	Meeting with key persons from Ministry of Agriculture
	13:00-15:00	Lunch break
	15:00-17:00	Meeting with Johns Hopkins & UNICEF: Communication strategy
Thu. June 7	9:00-13:00	Visit to Mafrak Health Directorate: simulation exercise area (site visit, directorate, hospital, selected health centers)
	13:00-15:00	Lunch break
	15:00-17:00	

**Provisional Agenda
Week**

Sun. June 10	9:00-11:00	Visit to Amman Public Health Lab, PCR lab Al-Basheer Hospital (confirmed)
	11:00-12:00	Meeting with Dr. Yassin Amer & Eng. Moussa Wakileh from private poultry industry (confirmed)
	12:15-13:00	Meeting with Dr. Abdel Fattah Kilani, President of Veterinarian Association (Jon L. Schaeffer) (confirmed)
	13:00-15:00	Meeting with Assistant Secretary General for Primary Health Care & Disease Control Director to present preliminary findings (Maria Pia Sanchez) (confirmed)
	15:00-17:00	
Mon. June 11	9:00-13:00	Visit to Ajloun Health Directorate: poultry outbreak area (site visit, directorate, hospital, selected health centers) (confirmed)
	13:00-15:00	Visit to Ajloun Castle
	15:00-17:00	
Tue. June 12	9:00-11:00	Visit to King Abdullah hospital, Irbid: AI referral hospital (confirmed)
	11:00-13:00	Visit to the Dept. of Pathology & Animal Health, Faculty of Veterinary Medicine, JUST (confirmed)
	13:00-15:00	Lunch at King Abdullah Hospital
	15:00-17:00	Meeting with Johns Hopkins & UNICEF: Communication strategy (confirmed)
Wed. June 13	9:00-11:00	Visit to Ministry of Health Stores: stockpiles of antiviral, PPEs (confirmed)
	12:00-13:00	Meeting at WHO office with WR (confirmed)
	13:00-15:00	Break
	15:00-17:00	
Thu. June 14	10:00-13:00	General meeting: discussion & recommendations (confirmed) Submit preliminary report of findings
	13:00-15:00	US embassy (to be confirmed)
	15:00-17:00	

ANNEX 3: MEMBERS OF THE NATIONAL TECHNICAL COMMITTEE

	Title	Institution
1	Under Secretary for Technical Affairs	Ministry of Health/Committee Chair
2	Assistant Secretary General for Primary Health Care	Ministry of Health
3	Head of Public Health Lab Dept., Laboratory Directorate	Ministry of Health
4	Director of Chest Diseases	Ministry of Health
5	Member	Royal Medical Services (Military)
6	Member	Ministry of Agriculture
7	Member	Ministry of Agriculture
8	Member	Ministry of Agriculture
9	President	Veterinarian Association
10	Pediatrician	Faculty of Medicine, Jordan University
11	Chest disease Specialist	Faculty of Medicine, Jordan University
12	Microbiologist	Faculty of Medicine, Jordan University
13	Head of Dept. of Pathology & Animal Health	Faculty of Veterinary Medicine JUST
14	Member	UNRWA
15	Public Security	Ministry of Interior
16	Civil Defense	Ministry of Interior
17	Member	Royal Society for the Conservation of Nature
18	Member	Jordan Food & Drug Administration
19	Member	Greater Amman Municipality
20	Member	Private Poultry Industry
21	Member	Private Poultry Industry

ANNEX 4: LIST OF DOCUMENTS/REPORTS RECEIVED

- Jordan Avian/Pandemic Influenza Preparedness Plan (MOH)- February 22, 2007
- Avian Influenza Communication Strategy- prepared by the AI Communication Committee with technical assistance from Jordan Health Communication Partnership- March 2006
- Jordan Influenza Preparedness Plan: recommendations for national measures before and during pandemic influenza- Version 1 Sept. 2005
- Agency Avian Influenza Task Force: rapid assessment for avian and pandemic influenza preparedness- October 2005
- WHO Mission Report: Review of the Emergency Management System in Jordan- Feb. 2007
- National Comprehensive Plan for Encountering Emergencies and Disasters for the year 2003
- National Contingency Plan for Avian Influenza
- PART 1: POLICY DOCUMENT (03 October 2006) MOAg
- National Contingency Plan for Avian Influenza MOAg
- PART 2: MANUAL OF STAFF INSTRUCTIONS (05 October 2006)

ANNEX 5: LIST OF ACRONYMS

AI	Avian Influenza
BSL-3	Bio-safety Level 3
CDC	Centers for Disease Control and Prevention
EU	European Union
FAO	Food and Agriculture Organization of the UN
H5N1	Highly pathogenic strain of avian influenza
HPAI	Highly Pathogenic Avian Influenza
ILI	Influenza-like illness
JOVAC	Jordan Vaccine Laboratory
JPS	Jordan Poultry Syndicate
JUST	Jordan University of Science and Technology
JVA	Jordan Veterinary Association
MOA	Ministry of Agriculture
MOH	Ministry of Health
NAMRU 3	Naval Medical Research Unit 2
NTC	National Technical Committee
OIE	Office of International Epizootics
PPE	Personal Protection Equipment
RT	Rapid test
Panflu	Pandemic influenza
RT-PCR	Reverse Transcriptase Polymerase Chain Reaction
P Stock	Parent breeding stock
SARI	Severe acute respiratory infection
SOP	Standard Operating Procedure
TOR	Terms of Reference
USAID	United States Agency for International Development
WHO	World Health Organization

ANNEX 6: MOH ORGANOGRAM



