

AVIAN FLU SCHOOL ASSESSMENT

NARRATIVE SUMMARY

Response to the current HPAI global animal health emergency requires the training of veterinarians, public health workers, laboratory scientists, livestock producers, wildlife and zoo managers, and government officials in emergency management, virus surveillance, sample collection and reporting, biosecurity, and disease containment. Currently, the numbers of trained responders is grossly inadequate to respond effectively to HPAI outbreaks in most parts of the world, particularly in developing countries.

The Avian Flu School Assessment developed an international train-the-trainer course covering the essential skills for prevention and detection of and response to an H5N1 highly pathogenic avian influenza (HPAI) outbreak. During the assessment period, three pilot courses were conducted: one at UC Davis (August 1-4) with international participants; one at Sokoine University of Agriculture, Morogoro, Tanzania (August 21-24); and one at Texas A&M University (September 11-14) with international participants. Participants provided evaluations of four course modules, and a critique of the course as a whole. The Assessment also included discussions with avian influenza coordinators and officials of government ministries, international nongovernmental organizations, universities and laboratories in Tanzania, Malawi, Uganda, and Kenya. In addition, we discussed the AFS course with the participants from Mali, Nigeria, Senegal, and Libya. The AFS course received very positive reviews from participants and observers from various agencies. The Assessment Team concluded that HPAI prevention, detection, and response training needs to occur at the national, district and village or community level.

Based on the work of the Assessment Team an international Avian Flu School curriculum is now ready for use in different countries and environments. Course materials and guidance documents for Avian Flu School are available at: www.avianfluschool.org.

RESEARCH

Overall Problem Model and Approach. The east Africa Region is host to about 300 million poultry and 287 million people. An estimated 60 to 70 percent of poultry in the region is kept under backyard or village-wide, free-ranging conditions. The region is also crossed by the Rift Valley corridor, a major flyway for migratory birds. The free-ranging poultry may be exposed to migratory birds, with the potential for HPAI transmission. Major rice production areas and wetlands in the region provide the opportunity for mixing between migratory and resident wild birds and domestic flocks. In addition, chickens and other poultry and poultry products are transported by buses and trucks across the region, providing many opportunities for virus transmission.

Response to the current HPAI global animal health emergency requires the training of veterinarians, public health workers, laboratory scientists, livestock producers, wildlife and zoo managers, and government officials in emergency management, virus surveillance, sample collection and reporting, biosecurity, and disease containment. Currently, the numbers of trained responders is grossly inadequate to respond effectively to HPAI outbreaks in most parts of the world, particularly

in developing countries. It is important to train district level veterinarians, public health workers, and agricultural extension staff, and to train people at the village level on measures to prevent and to respond to HPAI outbreaks.

Avian Flu School Assessment. To address the training needs related to HPAI, the Avian Flu School (AFS) Assessment (May-December, 2006) set out to:

1. Develop an effective international Avian Flu School curriculum
2. Pilot and evaluate the AFS Course
3. Launch a Web site to support AFS training

Activity 1: Develop an International Avian Flu School Curriculum

Progress. The AFS Assessment Project developed a course for veterinarians, public health workers, laboratory scientists, livestock producers, wildlife and zoo managers, and government officials. The

course curriculum was designed in a modular and lesson format to be adaptable to different countries and environments, and flexible to be tailored to the information and skills needs of different groups.

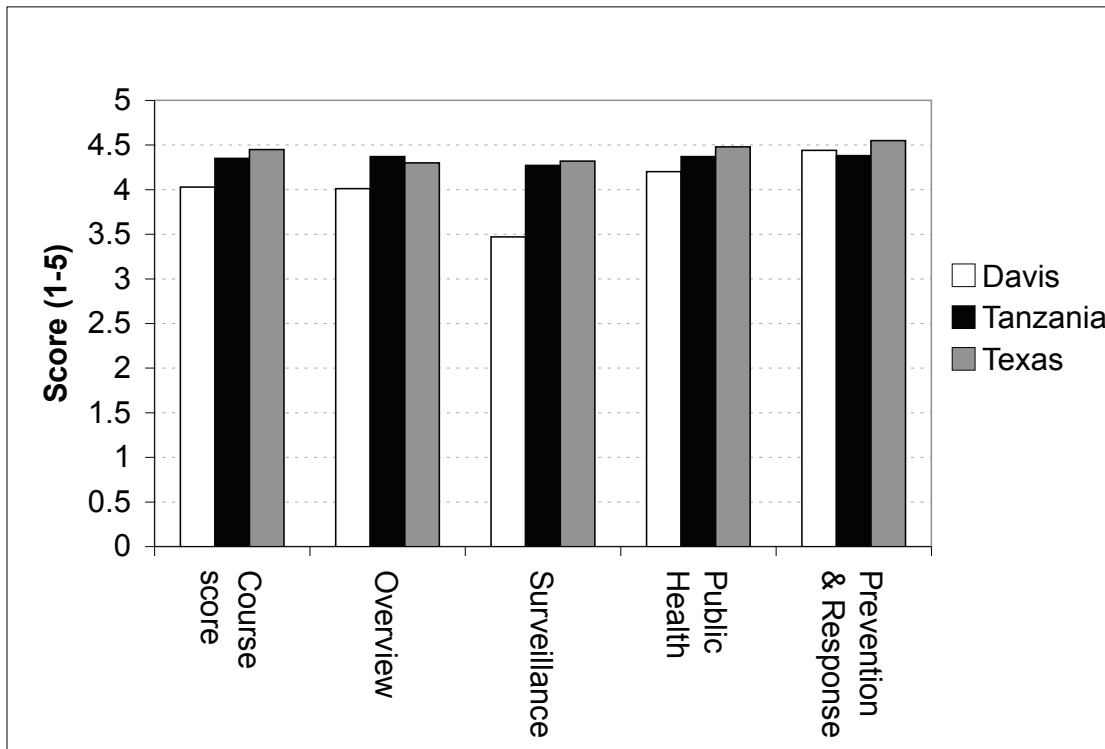
The complete AFS course is three days of workshops with short lectures and small group exercises, plus a half day of practical exercises. The classroom curriculum covers critical information for HPAI emergency management and communications planning, virus surveillance in domestic and wild birds, public health and worker safety, and HPAI prevention, detection, and response and recovery. In the laboratory session, participants practice using personal protective equipment (PPE), vaccination of domestic birds, swabbing and bleeding a chicken (or duck), and proper packaging for shipping of diagnostic and virus samples, and how to safely clean a chicken or duck. The course materials include illustrated handouts for important tasks.

The AFS course outline is presented in the table below.

Table 1. Avian Flu School Course Outline.

<p>Module 1: Overview (1 day)</p> <ul style="list-style-type: none"> •Introduction •Avian Flu Viruses •History of H5N1 HPAI •HPAI Transmission •H5N1 HPAI Risk to Humans •Impacts of H5N1 HPAI •Virus Surveillance, Testing, and Reporting •Coordination and Management of an HPAI Emergency •Communications Planning <p>Module 2: Surveillance (4 hours)</p> <ul style="list-style-type: none"> •Introduction •Surveillance of H5N1 HPAI: Steps, methods, types, and objectives •Sample size calculation •Surveillance in poultry and captive populations •Surveillance in wild birds •Developing an H5N1 HPAI Surveillance Plan <p>Module 3: Public Health and Worker Safety (2.5 hours)</p> <ul style="list-style-type: none"> •Introduction •General public education and protection •Poultry farm worker protection •Backyard/small holder poultry owner protection 	<p>Module 3 (continued)</p> <ul style="list-style-type: none"> •Live-bird market worker protection •Medical worker protection and patient protocol •Public health team protection •First responder protection •Healthcare worker protection <p>Module 4: Prevention and Response (1 day)</p> <ul style="list-style-type: none"> •Introduction •Prevention •Response •Recovery •Scenarios (Smallholder Poultry Operations, Wet (Live) Markets, Commercial Poultry Facilities, Zoological and Aviary Collections, Wildlife Refuges, Parks) •Developing Prevention Plans •Developing Response Plans <p>Practical Session (3 hours):</p> <ul style="list-style-type: none"> •Packaging a virus sample for shipping •Putting on and removing PPE •Cloacal and oral cavity swabbing for samples (1 person, 2 person) •Vaccinating a chicken •Bleeding a chicken •Safe slaughter and cleaning a chicken
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Figure 1. Overall Participant Evaluation Scores of the AFS Pilot Courses.



Activity 2: Pilot and Evaluate the AFS Course

Progress. The AFS Assessment Project conducted three pilot courses: one at UC Davis (August 1-4) with international participants; one at Sokoine University of Agriculture, Morogoro, Tanzania (August 21-24); and one at Texas A&M University (September 11-14) with international participants. The Assessment Project also organized discussions with avian influenza coordinators and officials of government ministries, international nongovernmental organizations, universities and laboratories in Tanzania, Malawi, Uganda, and Kenya. In addition, we discussed the AFS course with the course participants from Mali, Nigeria, Senegal, and Libya. Based on the evaluations from participants of the pilot courses and on comments and needs expressed in the discussions with avian influenza coordinators and officials, the course curriculum and training methods were honed and the training model was developed further.

AFS Course Received Excellent Evaluations. The AFS training program received very positive

evaluations at each pilot course. After each of the four modules, course participants were asked to fill out an evaluation form. At the close of each pilot workshop, the trainees participated in a facilitated discussion to critique and suggest improvements for any part of the curriculum and training methods. After each pilot course improvements were made to the course curriculum and exercises based on input from participants. The results of the pilot course evaluations are summarized in the figure below. Participants at each of the three pilot courses (Davis, Tanzania, Texas) were asked to rank each of the four modules on a scale of 1-5, five being best.

A Tanzania public health official that participated in the pilot workshop said, “I thought I knew a lot about avian influenza, but now that I have completed this workshop, I realize that I knew very little about it. But, now I feel I understand avian influenza. I believe it is important to conduct the AFS course for the public health community in Tanzania.” A veterinarian with the Veterinary Investigation Centre, who completed the Tanzania workshop, made a similar statement.

John Coakley, the USDA-APHIS coordinator for international avian influenza training, who participated in the Texas pilot course, said “I have been involved in training for over 20 years, and Avian Flu School is one of the best workshops I have ever participated in.”

The AFS Course Covers the Key Topics. Nations have prepared HPAI Preparedness and Response Plans according to the OIE/FAO guidance document on preparing such plans. At the Tanzania pilot workshop, we compared the AFS curriculum with the training needs identified in the Tanzania National HPAI Preparedness and Response Plan. AFS covers all the training subjects identified except one. The one exception was the training of technicians to conduct laboratory diagnostic tests for viruses. Other programs are focused on the training regarding laboratory techniques. By design, AFS is focused on the field training needs. (See chart below of the AFS course coverage of Tanzania national plan training

topics). The national coordinators, universities, and NGO officials we met with in Tanzania, Malawi, Uganda, and Kenya confirmed the AFS curriculum covered the important topics and they expressed strong interest in collaborating with the AFS program to conduct training workshops in their countries.

The AFS Assessment Project Concluded that HPAI Training is Needed at Three Levels. The AFS Assessment concluded that HPAI prevention, detection, and response training needs to occur at three levels or tiers:

- Tier I - is the training of instructors among existing professionals and national officials among public health and animal health public health ministries and veterinary service departments.
- Tier II - is the training of district veterinarians, agricultural extension staff, wildlife managers and public health workers.

Table 2. AFS coverage of Tanzania National Plan training topics.

Tanzania Plan Components	Avian Flu School Topic Coverage
Plan Background on HPAI H5N1	Module 1 Overview
Annex 3 Logical Framework	
Output 1 Capacity for Early Detection	Module 2 Surveillance
Output 2 Ability to contain AI	Module 4 Prevention & Response
Output 3 Reducing Human Infection	Module 3 Public Health & Worker Safety
Output 4 Increase Public Awareness	Module 1 Communications Planning
Output 6 Management & Coordination	Module 1 Coordination & Management
Annex 5 Implementation Schedule	
Training in 1st Year	Avian Flu School ready for 1st Year
Annex 6 Contingency Arrangements	
2.0 Response Actions	Module 4 Response Principles & Plans
2.2.5 Surveillance Activities	Module 2 Surveillance
2.2.6 Vaccination of flocks	Module 2 Module 4, Practical--Vaccination
3.2 Notification of Disease	Module 1 Reporting
3.3 Biosecurity	Module 4 Biosecurity principles & plans
3.6-3.8 Slaughter, disposal, disinfection	Module 4 AFS Handouts
4.0 Coordination & management	Module 1 Coordination & Management
Annex 7	
Project Organizational Structure	Module 1 Coordination & Management
Annex 8	
Flow Diagram for AI Outbreak	Module 1 Reporting Decision Tree

- Tier III - is the training at the village level, to be conducted by the district veterinarians, agricultural extension workers, or by field staff of other health networks.

The Tanzania Pilot Developed Approach for Village-Level HPAI Training. The Tanzania pilot course also discussed the challenges of preventing, detecting or responding to HPAI in village-level free-ranging poultry settings, where Newcastle disease is often endemic. Newcastle disease is a complicating factor for field diagnosis of HPAI because the clinical signs in chickens for Newcastle disease and HPAI are similar. The Tanzania workshop participants discussed and recommended the implementation of a village-level HPAI training program coupled with a viscerotropic velogenic Newcastle disease (VVND) vaccination program. The theory is that the improved chicken production at the village level due to the vaccination for Newcastle disease will be a strong incentive for village communities to participate in the HPAI training program. The increase in chicken productivity will also increase value of poultry to the community, increasing the incentive to prepare village biosecurity plans.

Activity 3: Launch a Web site to Support AFS Training

The AFS Assessment Project developed a Web site to support the organizing of course workshops internationally. The AFS Web site, at www.avianfluschool.org, provides the following:

- Guidance for organizing a training workshop
- Directions for ordering AFS course materials or a custom course
- Guidance for locating AFS instructors
- Recommended resources for instructors

GENDER

The AFS Assessment Team and participants in the AFS pilot courses included members of both genders. Carol Cardona led the Assessment Project as the Principle Investigator. Deana Clifford contributed to development of the Surveillance

Module. Sandy Shanks conducted background research and writing for the training materials. Twelve of eighteen participants of the Davis pilot course were women. Four of twenty participants of the Tanzania course were women. Eight of twenty-one participants of the Texas course were women.

In east Africa, typically women raise chicken flocks at the village level to provide protein for their families and to sell to earn some disposable income. Women and children are often the principal manager of small-scale and village-level poultry production. The Assessment Project concluded that training regarding HPAI must include methods that involve women in HPAI prevention, detection, and response planning at all levels.

POLICY

The results of the AFS Assessment have been shared with U.S. and international agencies, non-governmental organizations and ministry officials that are engaged in planning HPAI training workshops in the U.S. and abroad. Findings of the Assessment are being used to design efficient training programs to where funding is limited. Representatives of international agencies and national ministries that participated in the AFS Assessment pilot workshops have applied what they learned. Some participants have since organized HPAI trainings, and others have indicated their plans to include the topics of AFS curriculum in future workshops.

OUTREACH

AFS staff met with and provided updates to avian influenza coordinators and officials of government ministries, international nongovernmental organizations, veterinary universities, and laboratories in Tanzania, Malawi, Uganda, and Kenya. Outreach has included meetings representatives of the World Health Organization, the Centers for Disease Control and Prevention, the World Organization for Animal Health (OIE), the United Nations Food and Agriculture Organization, USAID Missions, and USDA-Animal and Plant Health Inspection Service. AFS has launched a Web site to provide updates

and support for the international community to plan and conduct HPAI training workshops (www.avianfluschool.org).

DEVELOPMENTAL IMPACT

Environmental impact and relevance. Improvements in poultry health and productivity will also reduce pressure to secure protein from wild sources thus contributing to better management of natural resources.

Agricultural sustainability. Poultry production is a key component of small farm production and maintenance of rural livelihoods. Animal disease threatens the sustainability of farming and the rural economy. AFS provides the skills to improve poultry health and productivity, and thus contributes to agricultural sustainability.

Biotechnology. The AFS project applies knowledge based on biotechnology research. Prevention, detection, and response principles have benefited from research on the ecology of viruses and the development of technology to identify, assess and study avian influenza, Newcastle disease, and other diseases. AFS provides the knowledge to apply the results of this research and technology development.

Contributions to U.S. agriculture. HPAI, exotic Newcastle disease, and other animal diseases are a threat to U.S. agriculture. In today's world of international travel and commerce, there is a constant threat of diseases spreading from other countries to the U.S. Thus, efforts to prevent and control diseases abroad reduce the likelihood that those diseases are introduced and afflict poultry and livestock in the U.S. agricultural sector. AFS contributes to preventing and controlling poultry diseases that could eventually spread to the U.S.

Contributions to host country. HPAI is one more disease afflicting people and domestic animals in the rural communities of Africa. The devastation of village chicken flocks directly affects the health and livelihood of people that depend on them for meat and eggs. The loss or low productivity of chicken flocks is particularly detrimental to women that raise them to feed their families and

rely on the sale of chicken products to earn some disposable income. The AFS program will increase the capabilities of national and district animal and public health officials and workers to prevent and control H5N1 HPAI in the countries where it is taught and applied.

Linkages and networking. Successful prevention, detection and response to HPAI requires a high level of collaboration between local, national, regional and international animal health and public health agencies and non-governmental organizations. The AFS Assessment Team has met with avian influenza coordinators and appropriate ministries and non-governmental organizations to solicit guidance and comments on the AFS curriculum, course design, and efficient methods to reach target audiences at the national, district and village level.

Collaboration with international research centers (IARCS) and other CRSPs. Future AFS workshops and research may be conducted in collaboration with international research centers and CRSP programs in various countries.

OTHER CONTRIBUTIONS

Support for free markets and broad-based economic growth. Disease in poultry and livestock decreases productivity in the agricultural sector and is a major barrier to commerce in these products. The principles of disease prevention and response as learned through the AFS program apply to avian influenza, exotic Newcastle disease, and other diseases afflicting domestic animals. Improvements in animal health are important for economic growth and market development in the agricultural sector.

Contributions to and compliance with mission objectives. The AFS program contributes to the Tanzania Mission's objectives for Economic Growth, Health, Education, and Environment and Natural Resources Management. Through AFS, improving poultry health will contribute to the productivity and economic value of poultry production. Rural families depend on poultry production for food and to sell to generate income. An increase in poultry health and productivity will directly benefit the rural family livelihoods. AFS is

an education program that provides information to empower families and poultry producers to improve their own economic conditions. Improvements in poultry health and productivity will also reduce pressure to secure protein from wild sources, thus contributing to better management of natural resources.

Concern for individuals. Individuals and families raise small poultry flocks for subsistence and for earning income. The methods and skills learned through the AFS program are for application by major poultry producers and by individuals maintaining small flocks. Individuals can improve their own flocks and livelihood by applying what is taught in AFS.

Support for democracy. Improving people's livelihoods strengthens democracy. AFS contributes to the health and economic well-being of families, poultry producers and the farm sector.

Humanitarian assistance. When HPAI outbreaks occur, it is an animal health emergency and an economic disaster for the rural and agricultural regions. A core component of AFS is to train poultry producers, field veterinarians, public health workers, and government officials how to prevent and effectively respond to such an emergency. The AFS course also provides training on how to protect public health and workers.

LEVERAGED FUNDS AND LINKED PROJECTS

The total value for leveraged funds for the AFS project during 2006 was \$206,820.61. The sources of those funds were as follows:

National Center for Foreign Animal and Zoonotic Disease Defense (FAZD) contract, support for the Avian Flu School (U.S.) project, May-September 2006, \$99,975.48.

GL CRSP-USAID (PCE-G-00-98-00036-00, Subgrant: 139-27-29), support for the Health for Animal and Livelihood Improvement (HALI) Rungwa-Ruaha Ecosystem project, August 2006-September 2008, \$106,845.13.

TRAINING

Non-Degree Training

Avian Flu School Pilot Course, four day workshop, August 1-4, 2006 at the UC Davis School of Veterinary Medicine in Davis, California (U.S.A.). Facilitated by Carol Cardona, David Bunn, Daniel Beltran-Alcrudo, and Michael Clifford. Objectives: HPAI overview, surveillance, public health and worker safety, prevention and responses, and practical skills session. Attended by 18 participants (6 male and 12 female).

Avian Flu School Pilot Course, four day workshop, August 21-24, 2006 at the Sokoine University of Agriculture in Tanzania. Facilitated by Carol Cardona, David Bunn, Daniel Beltran-Alcrudo, Michael Clifford, Deana Clifford, Peter Msoffe, Rudovick Kazwala, and Pete Coppolillo. Objectives: HPAI overview, surveillance, public health and worker safety, prevention and responses, and practical skills session. Attended by 20 participants (16 male and 4 female).

Avian Flu School Pilot Course, four day workshop, September 11-14, 2006 at Texas A&M University in College Station, Texas (U.S.A.). Facilitated by Carol Cardona, David Bunn, Daniel Beltran-Alcrudo, and Christian Sandrock. Objectives: HPAI overview, surveillance, public health and worker safety, prevention and responses, and practical skills session. Attended by 21 participants (13 male and 8 female).

COLLABORATING PERSONNEL

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PUBLICATIONS

Cardona, C.J. et.al. 2006. Avian Flu School, an international course curriculum. Cooperative Extension and Wildlife Health Center, School of Veterinary Medicine, University of California, Davis.

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Web links for Avian Influenza:

<http://www.au-ibar.org/>

<http://www.au-ibar.org/Site2/en/ibar/Events/BirdFluEng.pdf>

<http://www.au-ibar.org/EN/Insight/Summary.htm>

<http://www.cdc.gov/flu/avian/groups.htm>

<http://www.cdc.gov/flu/avian/gen-info/facts.htm>

<http://www.promedmail.org/pls/promed/?p=2400:1000>

http://www.fao.org/ag/AGAInfo/subjects/en/health/diseases-cards/special_avian.html

http://www.who.int/csr/disease/avian_influenza/en/Adult_education_articles

http://www.who.int/csr/disease/avian_influenza/guidelines/pandemicfluprotocol_17.03a.pdf

<http://www.oes.ca.gov/Operational/OESHome.nsf/ALL/3D8DC8F9C9DCF2D688256FCB0065B847?OpenDocument>

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