PREVENT
Emerging Pandemic Threats

Semiannual Progress Report
April 1- September 30, 2014

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April 1–September 30, 2014

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ACRONYMS

AI	Avian influenza
CAHW	Community animal health workers (Burma/Myanmar)
CITES MA	Convention on International Trade in Endangered Species Management Authority (Vietnam)
DAH	Department of Animal Health (Vietnam)
EID	Emerging infectious diseases
FAO	United Nations Food and Agriculture Organization
FGD	Focus group discussion
FY	Fiscal year
HPAI	Highly pathogenic avian influenza
IPC	Interpersonal communication
IPC	Institut Pasteur du Cambodge (Cambodia)
Lao PDR	Lao People's Democratic Republic
LBVD	Livestock Breeding and Veterinary Department (Burma/Myanmar)
MLF	Myanmar Livestock Federation (Burma/Myanmar)
MOH	Ministry of Health (Burma/Myanmar)
MOLFRD	Ministry of Livestock, Fisheries and Rural Development (Burma/Myanmar)
MVA	Myanmar Veterinary Association (Burma/Myanmar)
MWF	Myanmar Women's Federation (Burma/Myanmar)
NEIDCO	National Emerging Infectious Diseases Coordination Office (Laos)
NGO	Non-Governmental Organizations
POA	Plan of Action (Burma/Myanmar)
RA	Rapid Appraisal
TIPS	Trials of Improved Practices approach
TOT	Training of Trainers
WHO	World Health Organization

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I. Introduction

This document describes PREVENT's activities during the period from April 1, 2014 through September 30, 2014. The contents are organized to reflect PREVENT's systematic investigation of the *human-animal interface* using a framework for emergence that examines three drivers:

1. Social customs/preferences, norms ("Culture");
2. Market system and trade ("Commerce"); and
3. Land-use change.

With a specific mandate to examine risks from EPT pathogens as yet unidentified, the PREVENT work is focused on multi-disciplinary research and communication work attentive to the identified drivers of emerging infectious diseases listed above.
The general objectives of PREVENT's work under both USAID and DFAT funding are to:

1. Determine which subpopulations are at increased risk of contracting and transmitting emerging infectious diseases
2. Understand which factors put them at increased risk
3. Identify and ideally test interventions to address these factors, thereby mitigating the increased risk. These interventions and outcomes include capacity building through training and the adoption of biosecurity measures.
4. Contribute to a conceptual model for human-animal exposure that accounts for social and epidemiologic factors and is based on evidence accrued under all EPT-1 projects.

These objectives are in line with DFAT's *Pandemics and Emerging Infectious Diseases (EID) Framework, 2010-2015,* which aims to help partner countries build and maintain capacities, systems and protocols in four main areas:

- promoting adherence to international standards of animal and human health
- strengthening systems for the prevention, detection and control of EIDs
- responding to outbreaks of EIDs when they occur
- building an evidence base for the response to EIDs

PREVENT activities are currently funded by USAID and the Australian Government's Department of Foreign Affairs and Trade (DFAT). Activities supported by DFAT focus on community-based activities in the Upper Mekong countries region (i.e., Burma/Myanmar, Cambodia, Lao PDR, and Vietnam). Direct costs for activities in Burma/Myanmar are funded by DFAT, notably a special program in collaboration with the UN Food and Agriculture Organization (FAO) focusing on highly pathogenic avian influenza (AI). This also includes the regional response to H7N9 avian influenza across the Upper Mekong countries bordering China.

II. Major Programmatic Activities and Results

A. Social Customs/Preferences, Norms ("Culture")

Culture, as a key driver of conditions that favor the emergence and spread of infectious disease, includes the learned attitudes and behaviors that affect how people, pets, livestock and wildlife interact. Work by PREVENT during the past half-year period to identify and distinguish high-risk behavior and practices that most commonly result in risky contact between humans and animals includes the following activities:

1. Research

a. Lao PDR Human-Animal Exposure Study

In the third quarter of the year (April to June), PREVENT staff began conducting an in-depth analysis of frequencies of exposure to the key animals, including predictors of these exposures and determinations of sub-populations that are most exposed.

During the fourth quarter (July to September), a more in-depth analysis of frequencies of exposure to the key animals – including predictors of these exposures and sub-populations that are most exposed – was conducted. This analysis compares the frequency of exposure patterns between the two study populations (Lao-Tai and Hmong), and among the subgroups (men and women, boys and girls).

Selected findings regarding groups at risk are as follows:

- ***Universal exposure to rats/mice*:** Nearly 100% of all age-gender-ethnic subgroups were exposed to rats/mice at some point in the last year. In both ethnic groups, 50% of people reported three or more encounters with rats/mice per day – higher than for any other animal group except poultry. Most people (80% of respondents in all groups) reported exposure to rats/mice in the home. There were no differences between the ethnic groups in terms of the frequency of their exposure in the home.

- ***Boys at risk:*** Boys, and especially Hmong boys, had high rates of exposure to bats and rats/mice. For instance, while most people reported exposure to rats/mice, Hmong boys were more frequently exposed than any other group. Lao-Tai and Hmong boys were also the most likely group to report hunting bats in the last year.

- ***Hmong men and non-human primates:*** Exposure to non-human primates was more common among the Hmong ethnic group. Among the Hmong, men reported the most frequent exposure: 25% of Hmong men reported more than seven encounters with non-human primates in the last year, compared with zero to two encounters by other Hmong groups.

- ***Females at risk:*** Women shared responsibility with men for the risky activities of butchering and cutting-up both rats and bats. Women and girls ate rats and also hunted them, but in smaller numbers than their male counterparts. Hmong women were most likely to use bat guano as fertilizer.

The report clearly demonstrates the association of frequency of exposure to key animals with social factors: ethnicity, gender, age, religion, occupation, wealth, and individual attitudes (probably influenced by culture). Some examples of these are:

- ***Ethnicity*** was one of the strongest factors influencing exposure in this study (e.g., more Lao-Tai consumed rats and bats and more Hmong consumed primates). There were also clear differences in patterns of exposure among different sub-groups within each ethnic group, suggesting different norms associated with societal roles in the two groups. For instance, while Hmong girls and women reported similarly frequent encounters with bats, Lao-Tai girls reported many fewer encounters than Lao-Tai women.

- ***Occupation*** was clearly associated with exposure. As an example, farmers reported more overall encounters with rats/mice.

- ***Wealth*** had some effect on exposure, as individuals in the highest asset group reported fewer overall encounters with rats/mice than those in the lowest asset group.

- While ***religion*** was not associated with many outcomes, it was shown that those following animist practices reported more frequent rat/mice consumption-related activities.

- While the two ethnic groups stated equally strong ***preferences for wild animal meats***, it was shown that a higher preference for wild animal meat by an individual was correlated with an increase in number of encounters with bats and increase in consumption-related encounters with rats.

  The current analysis of the human-animal exposure survey data showed clear links between various social factors and frequency of exposure to key animals of interest.

Status/Progress Towards Meeting Objectives: The in-depth analysis will help to refine conclusions and potential interventions that can be made for various subpopulations (e.g., males vs. females).

b. Lao PDR Rapid Appraisal on Human Interactions with Rodents and Bats

A second participatory rapid appraisal on human interactions with bats and rodents was conducted in Lao PDR from April to May 2014. A similar study was conducted on human interactions with peridomestic rodents in Khon Kaen, Thailand from June to August, 2013.

The goal of the Lao PDR study is to understand how people come into contact with bats and identify potential strategies for mitigating risky behaviors or situations related to bats in Lao PDR, as well as to verify and enhance findings on human-rodent interaction from previous PREVENT work in Lao PDR and Thailand. This study was conducted with men

(233), women (246), boys (71) and girls (68) in the Vang Vieng district of Vientiane province and the Khamkeut district of Bolikhamxy.
During the third and fourth quarters, the research team was hired and trained, field data was collected, transcription and translation were completed, and researchers began writing up preliminary findings.

Progress Towards Meeting Objectives: The PRAs in Southeast Asia (in Lao PDR and Thailand, to start) were undertaken to gain a better understanding of human-bat/rodent interactions, characterize specific behaviors and situations that put people at risk, and identify potential mitigation strategies.

In progressing toward these objectives, staff will continue to write up the appraisal findings in the final months of 2014, and are slated to conduct a dissemination forum to share the findings sometime in early 2015. The forum is expected to generate even further interest among various stakeholders, particularly those from the Agriculture, Forestry and Natural Resources, Wildlife, Health and Industry and Commerce. The ultimate goal is that attendees will create a list of possible mitigation approaches to be tested in subsequent behavior trials, and asked to identify possible implementers for interventions. They will also be asked to consider if there are any policy or regulatory changes that might create an enabling environment that would encourage adoption of better practices.

Additional Notes on Gender: Almost equal numbers of males/females participated in the PRA. It is expected that bat and rodent exposure will differ between men, women, boys and girls, thus all of these groups will be evaluated and analyzed separately as part of the final report.

c. Cambodia Avian Influenza Research

During the April – June time period, PREVENT received ethical approval for the qualitative sub-studies – the household qualitative study and the behavior trials – from the National Ethics Committee for Health at the National Institute of Health in Phnom Penh. However, fielding of the first sub-study and submission of the case-control amendment both went more slowly than expected. The staff person originally identified as the local PI became unavailable to lead the study; an alternative, Dr. Christina Wong was identified to lead the household qualitative study. Dr. Wong took the lead on developing the training materials and operational guides.

Institut Pasteur's analysis of the serologic samples was also delayed; if there are not at least nine positive samples, the envisaged cross-sectional case-control design will have to be changed to a longitudinal design. In either case, the results of the household qualitative study will be used to finalize the questionnaire that will be used to interview study subjects.

Susan Zimicki traveled to Cambodia in mid-August to initiate the household qualitative study portion of the "exposure to poultry study. The very labor-intensive first step was the initial recruitment of study staff. Table 1 shows recruitment categories, the number of submissions received and the final number of candidates who started training.[1]

[1] Gender breakdowns of these investigators and other individuals, as available, will be provided as an addendum to a future report.

Type of person	Local Investigator	Field researchers	Supervisors	Interpreters	Typists
Number needed	1	12	2	2	4
Number applications submitted (biodata and cv reviewed) Tot: 30 person-hrs	6	78	16	15	7
Number interviewed: Est 80 p-hrs	3	31	6	7	6
Number tested Est 8 hrs	-	-	-	5	6
Number consultant packages prepared (including rate verification) Est 30-40 hrs in the field, more by PREVENT admin at HQ to copy & answer Contract's questions	1	16	2	2	1 (Positions re-advertised; hiring under way in October)
Number candidates start training	1	10 + 3 from IPC	2 +1 from IPC	2	-
Number finally selected after first portion of training	1	10	2	2	

Training began on September 11, 2014; the recruited candidates were joined by four staff members from the Institut Pasteur du Cambodge, our partner in this study. To accommodate the national holiday of Pchum Ben (September 22-24, 2014), training was divided into two sessions. The first session was conducted by Dr. Christina Wong, an FHI 360 qualitative researcher, Dr. Susan Zimicki, PREVENT Technical Director, and Mr. San Thy, the local investigator. Topics covered included an orientation to the objectives of the study and an overview of the types of interactions people have with chickens, a review of ethical guidelines in research, and sessions on participatory photo documentation, techniques for conducting interviews, introductions to and in-classroom practice with different instruments (household mapping, observation, photo description and interviews with photographers).

A field practicum was held on September 18, 2014, during which candidate staff mapped households and observed chickens being slaughtered. Their field notes and expanded field notes were reviewed. During the final day of the first training session, focus group discussion techniques were reviewed and Dr. Wong led a focus group role-play. At the end of the first session, the trainers made a final selection of candidates based on their performance during the training, dropping three field researchers and one supervisor candidate. This left a roster of a local investigator (male), two local supervisors (male), and 10 field researchers (nine female).

After a second three-day training session, the team was poised to be dispatched to the field as of the end of the reporting period. With the slightly smaller-than-anticipated teams (5 instead of 6 researchers per team) we anticipate needing 11-12 days per village, but will be collecting data in two villages concurrently.

Information packets were submitted to both the FHI 360 and Cambodian IRBs summarizing changes to study procedures and updating the study instruments.

Additional Notes on Gender: The protocol calls for specifically recruiting, examining and analyzing women's activities and behaviors as part of the household survey component of the study. For the behavior trials, if a gender-neutral activity is being examined, both female and male primes will be enrolled. If it is not a gender-neutral activity (e.g., if only boys poach chickens), only the gender-appropriate participants will be enrolled. Participants in the case-control study will depend on the cases.

2. Interventions

a. Burma/Myanmar Avian Influenza Interventions

During this period, PREVENT intensified implementation of training activities to accomplish its capacity building objectives targeting public and private veterinarians, community animal health workers, poultry farmers and local officials in the five focus Mandalay Region townships of Sintkaing, Amarapura, Madaya, Pyawbwe, and Pyin Oo Lwin, as well as media orientation activities for media practitioners in Yangon, NayPyiTaw and Mandalay. Specific activities are outlined below.

Training of Trainer (TOT) Workshops on H5N1, H7N9, and Communication for MLF and MVA Trainers

PREVENT organized a second four-day TOT (the first one was in February 2014) in Mandalay on April 23 to 26, 2014 for additional trainers from the Myanmar Veterinary Association (MVA) and Myanmar Livestock Federation (MLF). These individuals were trained to conduct three-day training workshops for veterinarians, community animal health workers (CAHWs) and poultry farmers in the five target townships. The April training included 10 participants from MVA and nine from MLF; they were mostly veterinarians with some poultry farmers (members of MLF) (see photo below). Sixteen (16) of them were male and three were female. The gender distribution reflects the leadership structure of these two organizations where most officials and leaders are male.

The objectives of the TOT were to: use adult learning principles and participatory training methods to train public and private veterinarians, CAHWs and poultry farmers on prevalent poultry diseases in Myanmar, hand washing and personal hygiene, biosecurity, and interpersonal communication (IPC); conduct pre- and post-assessments of knowledge on H5N1 and H7N9; and develop a plan for conducting three-day training workshops in their coverage areas.

For this second TOT, PREVENT used a revised version of the Training Kit that was pretested during the first TOT in February 2014. Input and lessons learned from the first TOT were incorporated into this revised toolkit that now has three main parts: 1. Detailed guides to the 22 sessions that comprise the three-day workshop; 2. Participant Handouts; and 3. Tips for Trainers.

Like the first TOT, the first three days of this TOT were a simulation of the three-day training workshop that the trainers would be expected to conduct. The fourth day was devoted to honing the participants' training skills, familiarizing them with the Training Kit and pre- and post-test instruments, and preparing action plans on conducting the cascade three-day workshops in their townships. Participatory and experiential learning methods – games, demonstrations, role plays, plenary and small group discussions, and small group work – were used. Mini-lectures were used sparingly and only to summarize or synthesize learning points after an experiential training process. Games were played at regular intervals to energize the group and enliven the training environment.

April 23-26, 2014 TOT Workshop Outputs and Results

Action Plans for Cascade Trainings. The MVA, responsible for training 150 veterinarians and 100 CAHWs, and the MLF, tasked with training 150 poultry farmers, refined the action plans that were prepared during the first TOT in February. The MVA and MLF decided that

MVA would train veterinarians and CAHWs at five different three-day trainings in different townships, with five trainers at each session. MLF trained poultry famers at three different trainings in June 2014. Three additional trainings were held in July, three in August, and one in September 2014.

Pre- and Post-Workshop Assessment of Knowledge Gains. The pre- and post-assessment questionnaire, which was administered to participants at the beginning and the end of the four-day TOT, had the same 25 questions. These questions gauged participants' knowledge on H5N1, H7N9, IPC, and self-confidence as a trainer. Following are the results.

AI and Biosecurity Questions (12 questions)

- Pre- Assessment. Average of 8.89 questions correct
- Post-Assessment. Average of 10.16 questions correct (1.26 change)
    - 15 people answered more questions correctly
    - 1 person stayed the same
    - 3 people answered fewer questions correctly

IPC Questions (8 questions)

- Pre-Assessment: Average of 5.79 questions correct
- Post-Assessment. Average of 6.11 questions correct (.32 change)
    - 10 people answered more questions correctly
    - 4 people stayed the same
    - 5 people answered fewer questions correctly

Confidence as a trainer (5 questions)

- Pre-Assessment: Average 3.45 confidence level (out of 5)
- Post-Assessment: Average 4.05 confidence level (out of 5); (.60 change)
    - 14 increased confidence
    - 3 same confidence
    - 2 decreased confidence

Process Evaluation by Participants. All 19 participants completed the final process evaluation questionnaire (daily feedback forms were also completed by participants). The following are the key results:

- Fourteen (14) said that the learning objectives of the TOT were achieved (5 did not answer).
- The three sessions that were liked best were: Interpersonal Communication (15), Sessions 19-21 Role Plays (10), and H5N1 Match Game (6).
- The sessions that were liked the least were: Preventing Newcastle and Fowl Cholera (2). Sixteen (16) of participants listed: None, all sessions interesting.

Cascade Training Workshops on H5N1, H7N9, and Communication for Veterinarians and Poultry Farmers in Target Townships

The trained MLF and MVA individuals had the opportunity to put their new skills to work. In June 2014, MVA completed two three-day trainings for veterinarians (TVOs and private veterinarians) in Pyin Oo Lwin and Amarapura townships. A total of 60 veterinarians were trained. The full reports of these trainings can be made available upon request. Following are details on these trainings.

Pyin Oo Lwin Training – June 16 to 18, 2014: A total of 30 participants attended this workshop conducted by trained MVA trainers. Participants included 13 government veterinary staff (TVOs and Research Officers) from the LBVD and 17 private veterinarians – 6 company managers, 5 farm owners, 4 general practitioners and 2 CP (Charoen Pokphand) company dealers. There were 16 male and 14 female participants.

Amarapura Training – June 23 to 25, 2014: This workshop was attended by 30 participants: 15 LBVD staff and 15 private veterinarians comprising 6 general practitioners, 6 CP staff, 2 company managers and 1 from the Mandalay Community Development Committee. There were 22 male and 8 female participants.

In June, MLF was able to conduct three three-day training workshops for poultry farmers in Amarapura, Pyin Oo Lwin and Madaya townships. The trainings utilized the shortened three-day training module for poultry farmers agreed upon during the February 2014 TOT. The full reports of these trainings can be made available upon request.

- **Amarapura Training – June 23 to 25, 2014:** Fourteen (14) poultry farmers from 10 villages/wards of the township participated in this training.

- **Pyin Oo Lwin Training – June 25 to 27, 2014:** Fifteen (15) farmers, mostly proprietors of big and medium layer farms in the township, participated in this training.

- **Madaya Training – June 26 to 28, 2014:** Fourteen (14) poultry farmers completed this training.

Training Workshops for Public and Private Veterinarians

In July 2014, the MVA trainers trained by PREVENT during the two four-day TOTs (in February and April 2014) organized three-day cascade training workshops for 120 public and private veterinarians in Sintkaing, Madaya, and Pyawbwe. With these July trainings and the two trainings held for 60 veterinarians in Pyin Oo Lwin and Amarapura in June, the MVA was able to achieve the training target in its scope of work -- 150 public and private veterinarians.

The following table lists the trainings completed by MVA.

TOWNSHIP	Date of Workshop	Total # Participants	Male	Female
Pyin Oo Lwin	June 16-18	30	19	11
Amarapura	June 23-25	30	22	8
Sintkaing	July 6-8	28	17	11
Madaya	July 13-15	30	15	15
Pyawbwe	July 20-22	32	22	10
	TOTAL	**150**	**95 (63.3%)**	**55 (36.7%)**

There were significantly more males than females. This reflects the actual gender distribution of veterinarians in the field. The number of female veterinary participants increased in the latter workshops as a result of MVA's efforts to recruit more female veterinarians.

Of the 150 veterinarians trained, 89 (59%) were LBVD veterinarians, mainly Township Veterinary Officers (TVOs), while 61 (41%) were private veterinarians. The breakdown of public and private vet participants per township is depicted in the table below.

TOWNSHIP	Gov't Vets	Private Vets	Total
Pyin Oo Lwin	16	14	30
Amarapura	15	15	30
Sintkaing	17	11	28
Madaya	20	10	30
Pyawbawe	21	11	32
TOTAL	**89**	**61**	**150**

Based on their responses to the process evaluation questionnaires, participants found the three-day training effective and useful in their work. The veterinarians most liked the sessions on Practicing Role Plays and on H5N1 and H7N9. Participants also liked sessions 10-18 focusing on Biosecurity and IPC, and participated actively in the role plays.

In order to determine increases in knowledge and confidence to communicate on H5N1, each veterinarian participant was asked to accomplish pre- and post-assessment questionnaires. Both questionnaires contained 20 questions: e*ight questions on knowledge of H5N1, H7N9 and biosecurity*; s*ix questions on knowledge of IPC*; and s*ix questions on their level of confidence* regarding communication and sharing information on H5N1, H7N9 and biosecurity.

The perfect score on knowledge for each participant was 14, while the perfect score on confidence level for each participant was 30. Each participant's scores on knowledge and confidence multiplied by the total number of participants per workshop are the total scores reported below:

	No. Pax	**Maximum Scores**		**Knowledge Scores**		**Total Change**	**Confidence Scores**		**Total Change**
Township		**K**	**C**	**Pre**	**Post**		**Pre**	**Post**	
Pyin Oo Lwin	30	420	900	370	410	40	174	249	75
Amarapura	30	420	900	381	412	31	163	268	105
Sintkaing	28	392	840	360	386	26	159	248	89
Madaya	30	420	900	398	412	14	167	264	97
Pyawbwe	30	420	900	397	409	12	167	264	97
		Avg total/wkshp		**381.2**	**405.8**	**24.6**	**166**	**258.6**	**92.6**

In examining the results above, the veterinarian participants already had very high pre-test scores on knowledge, especially those from Madaya and Pyawbwe, many of whom scored the maximum 14 in the pre-test. *Their average total pre-test knowledge score was already 381.2 divided by 30 participants, or nearly 13 correct out of 14 questions per participant.* Thus, the participants could only improve by an average of 1 point. This accounts for the knowledge score improvement rate of only 6.5% (24.6/381.2).

On the other hand, participants' gains in confidence were quite significant, at 56% (92.6/166). Participants' pre-test confidence level scores were much lower than the maximum confidence scores, and significant improvement was possible and did occur. PREVENT Myanmar staff observed some of the veterinarian training workshops and noted that the MVA trainers became more confident and skilled in sharing the training content and facilitating the role plays than they had been during their TOT.

The post-assessment questionnaire for veterinarians contained two additional questions on actions that these veterinarians would commit to take after the workshop, also known as "commitment questions." One question asked them to list actions they would commit to doing immediately after the workshop, while the other question asked veterinarians to check three actions they would commit to do for a one-year period following the workshop. Responses to these two "commitment" questions will be analyzed and serve as the basis for follow-up monitoring of trained veterinarians' communication activities during the following year.

Issues and Lessons Learned from Veterinarians' Training

- The three-day module is relevant to the training, but many of the participants already had good knowledge of H5N1 and biosecurity (some attended previous trainings on biosecurity) and needed more specific information and updates on these topics. The participants also needed more training on H7N9.

- More public veterinarians than private veterinarians attended the training. Some private veterinarians could not stay for the entire three days due to other functions and lost opportunities for income.

- The training's focus on IPC is very relevant to veterinarians, whose capacity and confidence levels on IPC are still generally low.

- The same pre-post assessment questionnaire was used for veterinarians, CAHWs and poultry farmers. In this instrument, the questions on H5N1, H7N9 and biosecurity are very basic. For veterinarians who already have a high level of knowledge of the aforementioned topics, a more "difficult" assessment instrument may be more appropriate.

Community Animal Health Workers Training

From August to September 2014, the MVA trainers trained by PREVENT during the two four-day TOTs (in February and April 2014) organized five 3-day cascade training workshops for 100 CAHWs in the five focus townships. With these five workshops, the MVA was able to successfully accomplish its target for CAHW trainings per its SOW.
The following table outlines the CAHW trainings completed by the MVA.

TOWNSHIP	Date of Workshop	Total # Pax	Male	Female
Pyin Oo Lwin	August 4-6	20	18	2
Amarapura	August 11-13	20	15	5
Sintkaing	August 25-27	20	16	4
Madaya	September 1-3	20	17	3
Pyawbwe	September 10-12	20	18	2
	TOTAL	**100**	**84 (84%)**	**16 (16%)**

There are significantly more male than female CAHW participants. This reflects the actual gender distribution of CAHWs at the community level. Compared to the ratio of female veterinarians in the MVA trainings (36.7%), the ratio of female CAHWs is significantly lower (16%). This likely reflects the fact that more males than females are attracted to CAHW work compared to veterinary work. Being a CAHW generally requires a lower educational level than being a veterinarian, and CAHW expertise depends more on actual experience with animal health issues in the community.

CAHWs gave very good feedback on the training. Their responses to the process evaluation questionnaires revealed that the sessions they liked best were sessions on practicing role plays, H5N1 and H7N9, and Newcastle Disease. CAHWs found these sessions useful in

improving their technical knowledge on animal health issues. Many CAHW participants, even more than veterinarians, liked the sessions on biosecurity and IPC. One CAHW commented that this was the first time he realized the importance of communication in his work.

CAHW trainees during the IPC training sessions

Participants engaged in the tippy-tap learning module

The pre- and post-assessment questionnaires used during the veterinarian trainings were the same instruments used to determine the CAHWs' increases in knowledge and confidence in communicating on H5N1. The results, as summarized by the MVA, are summarized in the table below.

	No. Pax	Maximum Scores		Knowledge Scores		Total Change	Confidence Scores		Total Change
Township		**K**	**C**	**Pre**	**Post**		**Pre**	**Post**	
Pyin Oo Lwin	20	280	600	184	229	45	88	167	79
Amarapura	20	280	600	235	258	23	113	173	60
Sintkaing	20	280	600	249	266	17	113	170	57
Madaya	20	280	600	216	254	38	111	172	61
Pyawbwe	20	280	600	226	246	20	119	178	59
		Avg total /wkshp		**222**	**250.6**	**28.6**	**108.8**	**172**	**63.2**

These results show that CAHWs had good knowledge levels from the start, as evidenced by the average pre-test score of 222, or an average of 11 correct out of 14 questions answered (222 points/20 participants). This knowledge increased to an average of 250.6 points; when divided by 20 participants, this provides an average of 12.5 correct answers per participant (a 13% increase in knowledge).

CAHW participants' gains in confidence were quite significant, at 58% (63.2/108.8). Their pre-test confidence level scores were much lower than the maximum confidence scores (108.8), and there was much room for improvement, which did occur during the training. PREVENT Myanmar staff observed some of the CAHW trainings and confirmed that the MVA trainers were more confident and skilled in sharing the training content and facilitating the role plays than they had been during their TOT.

As was the case for the veterinarians, the post-assessment questionnaire completed by the CAHWs contained two additional questions on actions they would commit to take after the workshop. Responses to these two "commitment" questions will be summarized and analyzed, and will serve as the basis for follow-up monitoring of trained CAHW communication activities in the following year.

Issues and Lessons Learned from CAHW Training

- CAHWs have basic information about H5N1 and biosecurity, although their level of knowledge is lower than the veterinarians. The educational level of CAHWs is also lower than that of veterinarians and, based on feedback from trainers, technical topics in the module should perhaps be adjusted to adapt to the lower educational background and literacy levels of CAHWs.

- CAHWs found the communication modules very useful. One CAHW commented that this was the first time he had learned anything about communication tactics.

- A few CAHWs commented that they found the pre-post questionnaires difficult to understand. They expressed the desire to have easier pre-post test questions.

- CAHWs stated that they would have welcomed the opportunity to speak with trainers individually, even for five minutes, after the end of the training course.

- CAHWs suggested that it would be good to discuss their post-test responses after they have completed the questionnaire so that they can validate or correct their answers. For the trainers, discussion of post-test responses would also obtain insights on whether the question was not understood or if the participants did not understand the topic covered.

Poultry Farmer Trainings

From July to September 2014, MLF trainers trained by PREVENT during the four-day TOTs held in February and April 2014 conducted seven 3-day training workshops for 111 poultry farmers in the five townships. Forty-three poultry farmers had already been trained, bringing the total to 154 poultry farmers who had completed training, thus exceeding the MLF target of 150 farmers.

The following table represents the total number of MLF-organized workshops and farmer trainees.

TOWNSHIP	Date of Workshop	Total # Pax	Male	Female
Amarapura	June 22-25	15	15	-
Pyin Oo Lwin	June 25-27	15	15	-
Madaya	June 26-28	15	13	2
Sintkaing	July 6-8	15	14	1
Amarapura	July 15-17	15	14	1
Madaya	July 25-27	15	13	2
Pyin Oo Lwin	July 25-27	17	13	4
Pyawbwe	August 4-6	15	15	-
Sintkaing	August 15-17	16	10	6
Pyawbwe	September 7-9	16	16	-
	TOTAL	**154**	**138**	**16**

The above table shows the significantly more male (90%) than female (10%) number of farmers who attended. This gender ratio is much lower than in workshops with local officials, veterinarians and CAHWs. Pyawbwe did not have any female poultry farmer participants. Sintkaing, with a total of seven female farmers in attendance, had the highest female participation. PREVENT suggested that MLF invite more female farmers to the workshops, but MLF maintained that these numbers reflect the actual gender distribution of poultry farmers at the village level. In addition, female poultry farmers have household and family duties aside from their farm work, and their attendance at a three-day workshop would prove difficult.

The training for farmers used the same three-day module as the one used for veterinarians and CAHWs. During the TOT in February, MLF expressed concern that getting farmers to attend and participate actively for three full days of training may not be feasible. Consequently, a training of three half-days covering the basic sessions, as identified by MLF and LBVD, was formulated during the February TOT. MLF subsequently learned that it was possible to get farmers to attend for three full days, and thus all of the 23 modules of the three-day training were covered.

Based on their process evaluation feedback forms, participants appreciated the workshop. Sessions liked best were on using IPC, role plays, and speaking simply. Participants also liked the sessions on biosecurity, H5N1 and H7N9, Newcastle Disease. MLF trainers noted that in general, farmers' positive reactions and active participation increased with progression of the training.

The pre- and post-assessment questionnaires used during the veterinarian and CAHW trainings were the same instruments utilized to determine the poultry farmers' increases in knowledge and confidence to communicate on H5N1 as a result of the three-day training. Each poultry farmer accomplished the pre- and post-assessment questionnaires.

The results, as summarized by the MVA, are in the table below.

	No. Pax	Maximum Scores		Knowledge Scores		Total Change	Confidence Scores		Total Change
Township		**K**	**C**	**Pre**	**Post**		**Pre**	**Post**	
Amarapura1	15	210	450	187	202	15	341	396	55
Amarapura2	15	210	450	161	181	20	307	347	40
Pyin Oo Lwin 1	15	210	450	161	185	24	252	296	44
Pyin Oo Lwin 2*	12	168	360	133	155	22	227	251	24
Madaya 1	15	210	450	163	184	21	308	353	45
Madaya 2	15	210	450	193	197	4	290	326	36
Sintkaing1	15	210	450	164	195	31	314	361	47
Sintkaing2**	15	210	450	171	194	23	294	325	31
Pyawbwe 1	15	210	450	169	200	31	364	401	37
Pyawbwe 2	16	224	480	188	208	20	341	447	106
		Avg total-wkshp		**169**	**190.1**	**21.1**	**303.8**	**350.3**	**46.5**

* 3 participants did not complete the post-test and thus are not included here.
**1 participant completed only the post-test, and his responses are not included here.

The above results show that poultry farmers' pre-test knowledge of avian influenza was good, and nearly the same as the CAHWs. The average knowledge pre-test score was 169, or 11 correct out of 14 questions answered (169 points/15 participants). This level of knowledge may be due to the fact that many farmers had experience with avian influenza outbreaks in the past. During the post-test, knowledge levels increased to an average of 190.1 which, when divided by 15 participants, gives an average of nearly 13 (12.7) correct answers per participant (a 12.5% increase in knowledge).

Poultry farmers' improvement in confidence levels was fair, at 15% (46.5/303.8), but much lower than the improvement seen among CAHWs and veterinarians. This may be attributed to the fact that the farmers' pre-test confidence level scores were much higher than those of CAHWs and veterinarians. PREVENT Myanmar staff observed some of the MLF trainings and confirmed that the MLF trainers were confident about the content and showed skill in using participatory methods and facilitating the role plays.

As was the case for the veterinarians and CAHWs, the post-assessment questionnaire completed by the farmers contained two additional questions on actions they would commit to take after the workshop. As with the other workshops, responses to these two "commitment" questions will be summarized and analyzed, and will serve as the basis for follow-up monitoring of trained farmers' IPC and biosecurity actions during the upcoming year.

Participants proudly pose for photo with vest and cap of PREVENT Myanmar

Issues and Lessons Learned from the Farmers Training

- The farmer-to-farmer training approach proved effective. However, the presence of a veterinarian in the training is essential for responding to technical animal health issues.

- It is possible to attract predominantly male farmers to a three-day training. However, it may be difficult to persuade female farmers to attend three days of training due to their other duties.

- The MLF trainers worked well as a team. As the training workshops progressed, their expertise was enhanced.

- A comfortable workshop venue is important to the success of the training. MLF trainers reported that the participants were more focused and participated more in the better, more spacious rooms of the Myanmar Livestock Development Company (MLDC) in the townships. In townships where the facilities were not as comfortable (e.g., in Pyin Oo Lwin, where the training was held in a room in the LBVD compound), participants were not as focused.

Group photo of the Amarapura farmer training (II) on 17 July 2014

Group photo of Madaya farmer training (II) on 27 July 2014

Group photo at completion of the Pyin Oo Lwin farmer training (II) on 27 July 2014

Group photo of the Sint Kaing farmer training (II) on 17 August 2014

Group photo of the Pyawbwe farmer training (II) on 9 September 2014

Other Issues and Lessons Learned To Date

- **The Need and Interest in Communication Skills and Participatory Training among Veterinarians and Farmer Leasers**. In the course of implementing the TOT workshops, it became apparent that there is strong need and interest among LBVD officials, MLF officials, and MVA and poultry farmer leaders for training in communication skills, especially IPC and participatory training methods. Feedback from verbal and written evaluation forms consistently revealed that these two areas – IPC and participatory skills – are new skills that these stakeholders find useful in their work. This is an area where PREVENT can add the most value in its efforts to help prevent and reduce the risk of avian influenzas in Myanmar. The trainees also identified the need for support materials to help them more successfully undertake IPC activities in their communities. PREVENT will need to address this.

- **Support from NGOs and Government for Cascade Trainings and Need for Monitoring.** Partnering with NGOs like the MVA and MLF, in close collaboration with the government (LBVD), is turning out to be an efficient and effective way to strengthen capacity among various categories of field-based stakeholders within a relatively short timeframe. The LBVD has been very supportive in facilitating the recruitment of trainees (for the TOTs as well as the cascade trainings) and providing other necessary support. Capacity for training has been strengthened in MLF, MVA, and LBVD. However, it is important that the cascade trainings, especially the first ones that the MVA and MLF trainers will implement, be monitored by PREVENT to ensure that the sessions are followed according to the guidelines, and that pre- and post-assessment instruments are administered correctly. To address this, PREVENT staff have instituted a monitoring

system whereby a representative number of cascade trainings will be monitored and technical support provided, if necessary. PREVENT staff will also be present at all of the advocacy workshops for local officials (PREVENT is directly providing funding and administrative support for these).

- **Recruiting More Women to Participate in Training.** Throughout the TOTs, PREVENT consistently encouraged the participants to exert extra effort to recruit female participants. The two TOTs for the MVA and MLF attendees had a significantly lower number of female participants. PREVENT was informed that this reflected the actual gender ratio among the MVA and MLF leadership. However, the local officials' TOT had a fairly balanced ratio, since there were many female TVOs and LBVD laboratory staff. So far, the first two cascade trainings conducted by MVA for veterinarians had a total of 22 (37%) female and 63% male veterinarian trainees. PREVENT expects this ratio to improve. (The gender ratio for the poultry farmer trainings conducted by MLF will be provided in the next report. Hopefully, there will be greater female poultry farmer participation in these trainings.)

- **Delays in Scheduling Training Activities.** As in the past, PREVENT was faced with a few delays in scheduling TOT and cascade trainings. The two TOTs conducted in April were postponed from the previous quarter due to other commitments by the trainees. The MLF and MVA were able to launch their cascade training activities in June and completed all of their assigned activities by the middle of September. It is important that PREVENT keep close track of training schedules so that they are followed and work is completed according to plan.

Training of Trainer (TOT) Workshop for LBVD Trainers on Advocacy

On April 28-29, 2014, PREVENT held a two-day TOT workshop for LBVD trainers who would conduct one-day advocacy workshops for local officials in the five townships. There were 18 participants, seven male and 11 female, all from LBVD (see photo below). The five townships were represented by their respective Township Veterinary Officers (TVOs) of whom four (TVOs of Amarapura, Madaya, Pyawbwe, Pyin Oo Lwin) were female. Mandalay Region was represented by the Regional Veterinary Officer, three District Veterinary Officers (two male, one female), and the TVO of Mandalay township (female). The rest of the participants were from the LBVD of Mandalay Region, NayPyiTaw and a few surrounding townships.

The objectives for this workshop were for the participants to: know and understand basic facts on H5N1 and H7N9 prevention and control; understand the roles that local officials play in prevention and control of avian and pandemic influenzas; understand and appreciate the principles of effective communication; understand and effectively use participatory learning methodologies to plan, conduct and evaluate a one-day training of local officials on avian and pandemic influenza; and develop an action plan to conduct one-day trainings of local officials in their areas of coverage.

PREVENT used the two-day participatory training module developed during the first quarter of the 2014 calendar year. The first day was a simulation of the one-day advocacy workshop that the LBVD trainers would conduct for local officials in their respective townships. The second day was devoted to honing participants' training skills.

The sessions during Day 1 focused on H5N1 and H7N9, Biosecurity, Identification of the Role of Local Officials in Preventing and Controlling H5N1 and H7N9, an introduction to IPC, and Action Planning for Local Officials. All of the sessions used participatory training methods, and participants accomplished a pre- and post-assessment questionnaire to assess learning gains. This assessment was the same pre- and post-test to be administered to local officials during their one-day workshops. Participants also completed a Daily Feedback Form to gather their opinions on the TOT workshop process.

The sessions during Day 2 aimed to strengthen participants' skills in planning, facilitating and evaluating the one-day workshop for local officials. At the end of Day 2, participants completed a post-assessment questionnaire to evaluate their confidence levels related to their training ability. They also completed a TOT Evaluation Form to get their feedback on the previous two days of training.

April 28-29, 2014 Advocacy TOT Outputs and Results

Plans for One-day Advocacy Workshops for Local Officials. In their area groupings, participants formulated plans for conducting one-day workshops with 15 local officials in their localities. Each group, composed of the TVO and lab trainers from LBVD, set a proposed date for their workshop, identified the LBVD team members, and determined the

type of support they would need from LBVD (mostly approval for the workshop and/or the local authority) and from PREVENT (mostly funding). All of the area groupings scheduled a workshops for June/July.

Results of Post-assessment of Knowledge Gains. The post assessment questionnaire had 25 questions: the same questions and number as the pre-assessment questionnaire. These questions gauged participants' knowledge on H5N1, H7N9, IPC, and self-confidence as a trainer. Following are the results.

AI and Biosecurity (H5N1, H7N9) Questions (12 Questions)

- Pre- Assessment. Average of 6.18 questions correct
- Post-Assessment. Average of 5.82 questions correct (-.35 change)
    - 6 people answered more questions correctly
    - 5 people stayed the same
    - 6 people answered fewer questions correctly

IPC Questions (8 questions)

- Pre-Assessment: Average of 4.65 questions correct
- Post-Assessment. Average of 5.71 questions correct (1.06 change)
    - 10 people answered more questions correctly
    - 6 people stayed the same
    - 1 person answered fewer questions correctly

Confidence (5 questions)

- Pre-Assessment: Average 3.44 confidence level (out of 5)
- Post-Assessment: Average 4.06 confidence level (out of 5); (.62 change)
    - 12 increased in confidence
    - 3 had the same confidence
    - 2 decreased in confidence

On average, there was no change in knowledge levels on H5N1 and H7N9, and small increases in knowledge on IPC and confidence as trainers. On an individual basis, more participants correctly answered more questions on IPC and increased their self-confidence as trainers.

The pre-post assessment questionnaire used for this two-day TOT was the same questionnaire that was used for the four-day TOT, where participants' knowledge gains were significantly better. This might have been because of the greater opportunities to learn the material in four days compared to two days.

It is important to emphasize, however, that the TOT was intended for trainers to acquire knowledge and skills to enable them to improve local officials' basic knowledge on H5N1, H7N9, and biosecurity. Local officials do not need to know the technical details of these diseases. What is more important is that local officials become aware and appreciative of their roles and responsibilities regarding avian and pandemic influenzas, and commit to take action to prevent and control outbreaks. As a result, this two-day TOT focused more on these learning objectives.

In order for the pre-post assessment to measure gains in knowledge of topics actually covered during the trainings of local officials, PREVENT will revise the questionnaire so that

it tracks basic knowledge gains on H5N1, H7N9, biosecurity and IPC, and add questions on improved awareness and understanding by local officials of their responsibilities and their commitment to take appropriate actions. This will serve as the basis of monitoring the trained local officials.

Results of Workshop Process Evaluation by Participants

The following summarizes the responses from the 16 participants who completed the questionnaire:

- All said that the TOT objectives were achieved.
- Three sessions that were liked the best were: Introduction to IPC (15), Match Game (11), and Biosecurity Matrix (10). For IPC, one participant wrote that he/she obtained new knowledge on how to communicate. For the Biosecurity Matrix, one remarked that it would help "remind local authorities on the rules and responsibilities regarding biosecurity." The participants can also "apply this method to train local authorities."
- The three sessions liked least were: Role Play (3), Broken Telephone (3), Role of Local Authority (2), and Biosecurity (2). Regarding the Role of Local Authority, one of the two participants wrote that "I don't like (this session) but I know it's important to try it." Most of the participants, however, said that they liked all of the sessions.

One-day Advocacy Workshops for Local Officials

The LBVD trainers trained by PREVENT during the two-day TOT in Mandalay from April 28-29, 2014 completed six one-day advocacy workshops for 92 local officials in Mandalay Region and the five focus townships, as follows:

TOWNSHIP	Date of Workshop	Total # participants	Male	Female
Sintkaing	July 7	15	12	3
Madaya	July 9	15	14	1
Amarapura	July 10	14	9	5
Mandalay Region	July 21	16	10	6
Pyin Oo Lwin	August 7	16	12	4
Pyawbwe	September 13	16	8	8
	TOTAL	**92**	**65**	**27**

Participants of the local officials' workshops came from invited government agencies: General Administration (township level), General Administration (ward/village level), Health, Rural Development, Agriculture, Fisheries, Myanmar Police, Myanmar Red Cross, Education, Land Records, City Development Committee, Information Services, Planning, and Township Development. *There were significantly more male (65) than female (27) participants, reflecting the gender distribution of local officials at the township level, especially among more male-oriented agencies such as General Administration, Rural Development, Agriculture, Fisheries, and Police.*

The PREVENT Myanmar Country Coordinator (CC) and local consultant attended all six of the workshops. The CC helped facilitate workshop sessions while the Consultant handled administrative and financial matters. From their observations and participants' feedback from the process evaluation questionnaires, there was significant interest in the topics

covered. Participants appreciated the participatory learning methods used and sessions on interpersonal communication, which for many, were novel and useful in their work at the township level.

To determine learning gains from the workshop, pre- and post-assessment questionnaires were individually completed by each local official. Both questionnaires contained 10 questions: eight questions on basic knowledge of H5N1 and H7N9; and two questions on confidence levels (e.g., their current level of confidence in communicating with others on avian influenza and biosecurity).

A perfect score for each participant for the knowledge questions was 8, while the perfect score for each participant for the confidence questions was 10. The total scores for all participants are as follows:

Township	**# Pax**	**Maximum Points**		**Pretest Total Score**		**Post-Test Total Score**		**Change in Scores (+,-)**		**Percentage Increase**	
		Know	**Conf**	**Know**	**Conf**	**Know**	**Conf**	**Know**	**Conf**	**Know**	**Conf**
Sintkaing	16	128	160	96	99	112	137	16	38	16.7	38.4
Madaya	15	120	150	89	84	95	120	6	36	6.74	42.86
Amarapura	11*	88	110	56	76	77	104	21	28	37.5	36.84
Mandalay	16	128	160	104	85	124	126	20	41	19.2	48.2
Pyin Oo Lwin	16	128	160	109	95	121	125	12	30	11.01	31.6
Pyawbwe	16	128	160	102	91	113	140	11	49	10.8	53.85
AVG				**92.7**	**88.3**	**107**	**125.3**	**14.3**	**37**	**20.4**	**50.4**

***** Only 11 participants completed the questionnaires. Three had to leave before the workshop ended due to emergency work issues. Their scores were not included in the table.

It must be noted that many participants came in with a fairly high level of knowledge. The average pre-test total score for knowledge was 92.7 points. If this score is divided by the average number of participants per workshop (15), then the average pre-test score per participant is 6.2 correct answers out of 8 questions. This does not provide much room for a significant increase in knowledge during the post-test (maximum possible average increase in correct answers was 1.8). In fact, the total post-test average knowledge score was 107. Divided by the average number of participants per workshop (15), this gives a score of 7.1 correct answers per participant out of 8 questions.

A much larger improvement in participants' confidence levels – 50.4% - was evident based on pre- and post-test scores. PREVENT Myanmar staff attended all of the local official workshops and observed that the LBVD trainers were more confident and skilled at sharing the training content than they had been during the TOT in April 2014.

This post-assessment questionnaire included two additional questions on actions these local officials would commit to take after the workshop, also known as "commitment questions."

One question was on actions they would commit to undertaking immediately after the workshop, while the other question asked local officials to check three actions they would commit to in the year following the workshop. Responses to these two "commitment" questions will be summarized and analyzed, and will serve as the basis for follow-up

monitoring of local officials' performance in the five "Year 1" townships during the following year of PREVENT (October 2014 to September 2015).

Issues and Lessons Learned from the Workshops with Local Officials

- A few invited local officials were unwilling to attend the workshop or participate fully in the trainings because they thought that avian influenza was not their concern. However, for those who actually participated, the workshop strengthened their knowledge of avian influenza and increased appreciation of their important role in coordinating activities in their townships.

- A few heads of offices were not available and, instead, sent their junior officers to the trainings. This resulted in the latter's more limited contribution and lack of decision making ability during the workshops.

- Due to budget constraints, the target number of participants was limited to 15 per township. Thus, the LBVD could not invite other officials from other agencies such as Transport, Tollgate, Customs, and Trade, as well as representatives from civil society. Participation from these agencies would have enriched the workshop and enhanced local coordination after the workshop.

- For some officials with very tight schedules, a one-day workshop proved to be too long; a half-day workshop may have been more appropriate.

Half-Day Media Orientation

On June 24, 2014, MLF conducted the first orientation workshop on avian and pandemic influenza for media practitioners in Yangon. The half-day orientation was guided by the media orientation module developed by PREVENT earlier in the year. A total of 18 media practitioners (10 females and 8 males) from print, TV and radio attended (see photo below). The orientation impressed upon the participants the responsibility of media in reporting accurate information, especially during outbreak situations.

Media Practitioners Orientation

In July and August 2014, MLF senior officials who were trained to conduct half-day media orientations on H5N1 and H7N9 organized three half-day workshops for 46 media professionals in Mandalay, NayPyiTaw (NPT), and Yangon. These three orientations, plus the orientation conducted in Yangon in June, reached a total of 64 media practitioners, slightly short of the target 70 (30 from Yangon, 20 from NPT and 20 from Mandalay Region). The target in Mandalay was not achieved because of an emergency political issue on July 18 that postponed the orientation from the morning to the afternoon. The following table lists the orientations that were held.

VENUE	Date of Orientation	Total # Pax	Male	Female
Yangon	June 20	18	8	10
Mandalay	July 18	13	11	2
NPT	July 24	16	9	7
Yangon	August 11	17	5	12
	TOTAL	**64**	**33**	**31**

The table above shows the nearly equal gender distribution among male and female media practitioners. There was a larger number of female participants in the two Yangon workshops, while in Mandalay, there were more males than females in attendance.

MLF trainers were able to follow the prescribed module, which included a case study to educate media on their responsibility to report about avian and pandemic influenzas accurately, and to confirm information with LBVD or other responsible authorities.

Group photo of the Mandalay Media Orientation on Avian and Pandemic Influenza by MLF

Group photo of the Nay Pyi Taw Media Orientation group

Group photo of Yangon Media Orientation (II)

The media practitioners appreciated the participatory methods used – e.g., energizers and the case study – in the half-day workshop. Based on observations of PREVENT Myanmar staff, the participants appreciated the focus on their important role and their responsibility to accurately report information on disease outbreaks.

Burma Partners Meeting

A Partners Meeting was held in NPT to achieve the following objectives: a) present and discuss PREVENT Myanmar accomplishments as of July 30, 2014; b) discuss issues encountered and lessons learned in accomplishing activities; c) obtain reactions on these accomplishments from the Government and donors; and d) discuss strategies and the course of action moving forward.

A total of 38 participants attended this one-day meeting, including representatives from USAID Burma, FAO Myanmar, FHI 360, MVA, MLF, and LBVD (including the Township Veterinary Officers of the five PREVENT focus townships of Sintkaing, Amarapura, Madaya, Pyin Oo Lwin and Pyawbwe).

LBVD Mandalay Region Veterinary Officer Dr. Yang Naing Soe presented on the status of advocacy workshops for local officials. MLF Senior Advisor Dr. Than Hla presented on the status of three-day training workshops for poultry farmers and media orientations, and MVA President Dr. Tin Myaing presented on the status of three-day training workshops for public and private veterinarians and CAHWs.

During the last session, the PREVENT Consultant summarized the status of activities as well as issues and lessons learned elicited from the sessions' discussions. The following are the key issues and lessons learned:

With regard to strategies used in the POA:

- ***Mobilization of NGOs, MVA and MLF*** was an effective strategy to reach people through their networks.
- ***LBVD staff serving as trainers of local officials*** was effective because LBVD has the authority and credibility to train local authorities.
- ***The cascade training approach*** has been working well. Trainers have been conducting trainings effectively with monitoring by PREVENT Myanmar.
- ***Use of participatory training methods by trainers*** has been effective, with sharing occurring among trainees and engaging them.
- ***Trainers were able to use participatory approaches*** that were generally appreciated by trainees.
- ***Using the pre-post questionnaires as a measure of learning gains*** will need some tweaks. Questionnaires need to be revised to suit the knowledge levels and educational capacities of each of the trainee categories.

On the implementation of cascade trainings:

- ***The gender distribution of trainees*** reflects the actual gender distribution of the trainee groupings.
- ***Poultry farmers training*** showed that farmer-to-farmer training is effective, but there is still a need for a veterinarian to be present to respond to technical questions. In addition, a three-full-day training workshop is feasible.
- ***Training of veterinarians*** showed that slightly more public veterinarians could attend; private veterinarians could not stay for three whole days due to other functions and a lost opportunity for income. Veterinarians already know about H5N1, so there is more value to focus more on H7N9.
- ***Workshops for local officials*** revealed some difficulties in getting some local authorities to participate for one full day. There is a need for flexibility so that deputy heads can attend if heads of agencies are not available. Various local authorities come from sectors with varied interests, and H5N1 is not a priority for some. There is a need to get human and animal health authorities to coordinate with each other.
- ***Media orientations*** revealed that media practitioners are interested and engaged in learning through a participatory approach. It is important to establish a link between the media and credible information sources/authorities, especially during times of outbreaks.

PREVENT developed the Plan of Action (POA) for the following year (October 2014 to September 2015). On July 31, PREVENT presented the key elements of this POA to the Director General of LBVD who verbally granted approval. The DG also approved the following:

- The second-year townships would be five additional townships in Mandalay Region, to be selected by LBVD
- Continuing the partnership with MVA and MLF for training activities

- Continuing the involvement of trained LBVD trainers for local officials' advocacy workshops
- Collaborating with Myanmar Women's Affairs Federation

The DG stated that for the following year, LBVD and FHI 360 can sign a Letter of Agreement.

B. Market Systems and Trade ("Commerce")

Commerce includes both local and international market systems for key priority wildlife species – bats, rodents, and non-human primates – and domestic animals – including poultry, pigs, and other livestock. Work by PREVENT during the past half-year period to identify and distinguish risky contact, such as in markets and supply chains where large numbers of people and domestic animals come in contact with potentially infectious wild animals, includes the following:

1. Research

a. Description of Vietnam Wildlife Farms Research

In early April, PREVENT, in collaboration with the Convention on International Trade in Endangered Species Management Authority (CITES MA) under the Vietnam Administration of Forestry of the Ministry of Agricultural and Rural Development, conducted a pretest of the "Description of Wildlife Farm Practices" study instruments in An Giang, Vietnam. With support from the An Giang Department of Forestry Protection, the pretest, including cognitive interviews, was carried out with farm managers at nine farms. A team of U.S. - and Vietnam-based PREVENT staff worked together to implement the pre-test and synthesize the findings. A full administration of the quantitative data collection instruments was used to identify content and logistical issues. Cognitive interviewing was conducted to examine the understandability of the questions by farm managers. Based on the pre-test findings, the study data collection instruments, including consent forms and guidelines for conducting farm visits, were improved and finalized for the data collector training.

Data Collector Training

Through a competitive open-recruitment process PREVENT hired TNS, a research firm, to support implementation of the study. During this period, PREVENT staff from headquarters and Vietnam, with support from the local principal investigator, prepared and delivered a six-day training course, including a field practicum on data collection, for TNS staff and data collectors. In addition, representatives from the Southern Representative Office of Vietnam CITES MA and key leaders from provincial Departments of Forest Protection (DFP) from the 11 study provinces participated in the first day of training. Representatives from Ho Chi Minh City did not attend the training and, upon further discussion, are not available for the full-study due to understaffing. Therefore, after agreement and approval from Mr. Thai Truyen, Deputy Director of CITES MA and HCMC DFP, HCMC has been dropped from the study.

Trainees included 19 data collectors from TNS, as well as field supervisors, quality control supervisors, focus group discussion (FGD) moderators, FGD note takers, and representatives from the data-processing team. Training topics included the study objectives and ethical requirements during data collection and becoming familiar with the

data collection instruments. Different training methods were applied to help participants become familiar with the instruments. These included working in pairs to role play different farm scenarios, reviewing mock-up questionnaires to correct responses, and a read-through and Q&A sessions on each question in the study instruments. The training helped TNS staff to become familiar with the instruments and ensure smooth collaboration for the upcoming data collection.

During post-training it was felt that additional practice was required for the data collectors. Therefore, to ensure the quality of data collection, PREVENT organized a second practicum while TNS obtained permissions from the 11 study provinces.

During this period, PREVENT also determined the sampling frame for the study. Two potential lists of wildlife farms were being considered for the sampling frame: 1) the existing registration data; or 2) the census data currently being collected. Dr. Thu, consultant for FAO on the census, reported that census field work is complete in nearly all provinces. However, as data entry was not completed at the time the sample needed to be drawn, option 1 (existing registration data) was chosen so the study would not be delayed.

Debriefing between PREVENT and TNS teams after field practicum on FGD

Completion of Field Work

Researchers completed field work for the study in the 11 targeted provinces of southern Vietnam -- Dong Nai, Tay Ninh, Tien Giang, BRVT, Binh Thuan, Dong Thap, Lam Dong, Long An, Binh Duong, Binh Phuoc, and Ben Tre – from July 9 to August 10, 2014.

The on-farm assessment included a survey, *General Farm Characteristics & Species-Specific Module,* and a walkthrough tool, the *Wildlife Farm Walkthrough Module*. A total of 376 farms were visited during the on-farm assessment, and 139 farms were enrolled. With regard to each of the target animals, 31 civet farms, 60 porcupine farms, 47 wild boar farms, and one primate farm were assessed. Except for porcupine farms, we were unable to achieve the target sample size. The main reason farms were not enrolled was due to

inaccessibility (e.g., could not find the farm) (7%), ineligibility (88%), and farm manager/owner refusal (4%). Ineligible farms included those farms that were not raising the key animal anymore, were raising two or less of the key species, and/or the farm manager had been working on the farm for one year or less.

In addition to the on-farm assessment, five focus group discussions (FGDs) were completed using the *Wildlife Farming FGD Module:* two with porcupine farm managers, two with wild boar managers, and one with civet farm managers. Due to the insufficient number of primate farms (1) there was not a FGD conducted for primates. Only one civet farm FGD was conducted due to the low enrollment in the survey and interest from farm managers.

Data analysis and report writing are under way. A final report and dissemination meeting is expected to be held in the first quarter of FY 2015.

Additional Notes on Gender: The study is managed by one male and one female supervisor. Of the 19 data collectors, 13 are female and six are male. A quarter of the farm managers enrolled in the on-farm assessment were female and the remainder were male.

b. Vietnam Cross-Border Rat Trade Research

During this period, PREVENT staff launched the "Market Chain Analysis of the Cross-Border Rat Trade in Vietnam and Cambodia" study. PREVENT obtained IRB approvals from Vietnam, Cambodia, and FHI 360 before data collection began.

In April, the two co-principal investigators from FHI 360 (Kathleen O'Rourke and Betsy Costenbader) and the Regional Principal Investigator, Dr. Tran Minh Hai, facilitated a five-day training of both the Cambodian and Vietnamese field teams hired for this study. Following the training, the field teams practiced with the data collection instruments in Prey Veng and An Giang provinces for three days, dedicating one day to each of the following: the questionnaire, the mapping exercise, and the observation guide. The remaining day-and-a-half was spent debriefing and finalizing data collection implementation plans. Both teams began data collection on their respective sides of the Vietnam-Cambodia border in May.

The *Vietnamese and Cambodian teams trained for data collection*

Rat catcher in Cambodia, coming home from the rice field with morning catch

PREVENT staff completed field implementation of the study by the end of July 2014. The study was run by a core research team, with a designated implementation team for each country, running concurrently. The core research team consisted of two U.S.-based Co-PIs, a local PI, a DAH focal person and an RGC focal person, PREVENT's program coordinator in

Vietnam, a Cambodian-based program coordinator, and a U.S.-based project coordinator. The core team was supported by two implementation teams consisting of 10 field researchers (four Vietnamese and six Cambodian), local transcribers and translators, operations staff, and data entry personnel.

Data from this study indicated that the cross-border rat trade between Cambodia and Vietnam is currently thriving and may have grown significantly over the past decade. Many of the key informants for this study reported that demand for rats has increased in the last five years and that the rat trade has expanded its catchment area to accommodate increased demand.

Perhaps most notably, a 2003 study estimated that the entire volume of annual production of live rat meat for human consumption in the Mekong Delta region of Vietnam was between 3,300 to 3,600 metric tons (Khiem, et al.). In comparison, the sum total volume of live rats traded in the last year (that was reported by only the 77 participants in the four provinces of our study area who identified as market intermediaries) was 4,108 metric tons. Our calculation provides only a very rough estimate, but even with a large margin of error on either side of this calculation, the numbers suggest significant growth in the volume of rats being traded over the last decade.

According to the participants, there are five main types of market actors who move rats from the field to end users:

1) *Catchers*
   Catchers catch or trap rats. Some catchers use dry land traps such as live trap, dead trap, use of screen nets and fish pot traps. Other catchers use traps on water which includes the use of spears or electricity (single probe, electrical wire, or battery).

2) *Market Intermediaries*
   Market intermediaries are market actors involved in buying and selling rats and moving the rats from one place to another for profit. Market intermediaries may trade large or small quantities of live or processed rat. Processed rats may be purchased processed or the market intermediary may process the rats as part of the production process. There are three main categories of market intermediaries:
   - Dealers are market intermediaries who deal in and/or consolidate rats or rat products from a fixed location, and employ staff.
   - Collectors are market intermediaries who deal in and/or consolidate rats or processing rats from a mobile location such as a motorcycle or car or boat.

3) Processors
   Processors are market actors involved in one or more steps required to butcher or process (package, put on ice, or in other way prepare) rat meat for sale. Processors often work at rat dealer's houses, in their own home, or in the public market.

4) *Retailers*
   Retailers refer people who sell (live or processed) rats to end-users. They are often located in a public market or along the road. For some retailers it is customary to allow customers to select live rats which the retailer will then slaughter at their stall for their customers.

5) *Transporters*

Transporters move products from one location to another. This can be by bicycle, boat, motorcycle, truck, or other transportation means. Transporters are paid by dealers or collectors for their work. Some small collectors also transport rats but work for themselves and are included in the 'market intermediary' market group.

The main routes used to move rats from the field to end users in both countries typically involve numerous market actors from these five groups. Participants reported from three to eight market actors handling the rats in Cambodia, and from three to six market actors in Vietnam before reaching the end consumer. In addition, the main routes identified in Cambodia and Vietnam estimated that a rat will travel long geographic distances; on average, distances of 58 km and 121 km, respectively. The findings that there are so many different routes by which the rats move, that so many different actors are involved in the process, and that the routes cover such a large geographic area are all important factors that could affect the potential risk of disease spread in several ways. For one, the more consolidation points along the market chain of live rats, the more opportunities there may be for a sick rat to infect other rats in the cages. In addition, the longer a route – and the more people involved – would make it more difficult to track the source of infection should an outbreak occur. Finally, the methods of transportation used for live rats along these routes is of concern because in open-air vehicles such as motorcycles and flatbed trucks, live rats are able to shed excrement directly into the environment.

Although we were not successful in doing so, we made an effort in our study design and in our recruitment and selection approaches to observe and survey equal numbers of each of the different types of rat traders. This was because we wanted to capture the full array of means by which rat traders come in to contact with rats, and because we expected that the different roles played by each of the market actor groups would confer differing amounts of risk on each. Processors – all of whom reported slaughtering live rats on a weekly or more frequent basis in the last year and very rarely were observed wearing gloves – could be considered the most at risk of potential disease acquisition. Surprisingly, 76% of retailers also slaughtered rats weekly or more often in the last year. All but one of the processors and retailers who were observed working had direct contact with rat feces and urine. Rat bites were also commonly reported among these groups (32% and 40%, respectively, of each group on a weekly basis).

In contemplating the design of interventions tailored to processors as well as to retailers who process rats, one consideration is that processing rats before they are sold seems to be a more common practice in Vietnam than Cambodia. In trying to recruit and enroll processors, it was more difficult to locate processors in Cambodia. As a result, more than three-quarters of the processors and retailers in our study sample were Vietnamese. In addition, although it was not captured in our data collection instruments, we observed many more market and roadside stands selling processed rats in Vietnam than in Cambodia and when shown pictures of rat traders processing rats, our Vietnamese and Cambodian field teams told us that these pictures related to the Vietnam side of the border.

We also found that processors and retailers were almost uniquely female and that many of the processors were minors. Another similarity between the processors and retailers in our study sample is that they appeared to be the market actor groups most reliant on the

rat trade for their livelihood. When asked if they had work in addition to their role in the rat trade, 50% of processors and 40% of retailers said they had no other work.

A rat trader's risk of contracting a disease from rats is obviously dependent not only on whether they have direct or indirect contact with pathogens spread by rats, but also by the volume of rats they are in contact with on a regular basis. From this perspective, our study sample of market intermediaries would be considered the most at risk, as they reported trading the largest volume of rats. Indeed, if we use volume as an indicator of exposure risk in this study sample, market intermediaries would be considered the most at risk, followed by transporters, retailers, processors and then catchers. Nonetheless, although market intermediaries in this study reported trading the largest volume of rats, our observations showed that most market intermediaries had employees or assistants helping them with consolidating and transporting the rats and therefore it may be the assistants who more frequently have direct contact with the rats. In juxtaposition to retailers and processors, market intermediaries are predominantly adult males, and about three-quarters or more of them reported having work in addition to the rat trade. We did not enroll market intermediaries' assistants in our study therefore, follow-up research may want to better understand the role of this sixth potential market actor group.

Reports of being bitten by a rat weekly or more in the past year was highest for transporters (69%) and was also high among catchers (47%). Transporters and catchers deal almost primarily with live rats and typically catch and consolidate the rats with their hands, thus logically making their exposure to excrement and biting frequent. Transporters and catchers also reported slaughtering rats on a fairly frequent basis. They were not, however, observed to be slaughtering while conducting their work in the trade. This indicates that their slaughtering activity is most likely for personal and family consumption and is therefore on a much smaller scale than the processors or retailers. While catchers reported coming in contact with the smallest volume of rats, this group contained the largest percentage of minors (ages 13 to 17). Their jobs entailed significant risks not only in the frequency with which they reported getting bitten by rats, but also in the methods that they described for catching rats, including in some cases, traps, spears, electricity, and poison.

While the trader profiles brought to light the differences in risk that exist according to one's role in the rat trade, all of the market actors had a significant similarity: they were all observed getting bitten by rats and coming into contact with rat excrement. The high reported levels of contact with rat bites, excrement, and blood, combined with low levels of disease knowledge and low perceptions of disease susceptibility when working with rats was troubling. Specifically, less than 10% of participants who completed the survey felt that they were at risk of getting a disease from rats, and only about 7% were able to correctly name diseases that are transmitted by rats. In addition, less than one-fifth of participants thought that getting bitten by a rat conferred any risk.

More encouragingly, almost all of the participants (97%) reported that washing their hands immediately after handling rats would help them stay healthier, and 71% of participants agreed that wearing gloves would reduce their chances of getting a disease from a rat. However, only about two-thirds of survey participants reported washing their hands with soap or antibacterial liquid the last time they washed their hands after handling rats, and less than one-third of participants who completed an observation were observed washing their hands with soap.

Overall, it has been difficult enrolling minors in the study in Vietnam. In Cambodia, there are many minors who are catchers. A full study report with recommendations for next steps will be available in the first quarter of FY2015.

Additional Notes on Gender: In Vietnam the team is led by a female team leader and consists of three female data collectors and one male data collector. In Cambodia the team is led by a male team leader and consists of four male data collectors and two female data collectors. Throughout the study we enrolled 176 males and 63 females.

Early observations of gender roles in the rat market chain indicate less male dominance in "central" market chain roles, such as rat trade dealer, collector, or wholesaler, than anticipated by the study team. In Vietnam, preliminary data suggests that almost half of those involved in the central market chain roles (about 40%) are women. There are slightly fewer women in these roles in Cambodia. In both countries, observations during study collection suggest that within the five main market chain roles (catcher, market intermediary, processor, transporter, and retailer) women tend to dominate the role of retailer and processor. Men are more likely to be catchers, transporters, and market intermediaries.

2. Interventions

a. Lao PDR Market Biosecurity Monitoring for Improvement Pilot

This period marked the completion of the first cycle of the "Market Biosecurity Monitoring for Improvement" activity in five pilot markets. The Market Biosecurity Monitoring for Improvement Pilot was implemented in two cycles. Cycle 1 spanned from January to April 2014. Under Cycle 2, market biosecurity monitoring began in May and ended in July 2014.

In Cycle 1, the pilot markets selected the improvements/goals they wanted to achieve and monitor until April 2014. For example, Houay Hong market decided to strive for the following improvements: providing a hand-washing station with soap and running water that buyers could access; improving display tables for meat that follow height and materials standards; providing waste disposal bins and locating them strategically near vendors' stalls; having vendors increase the cleaning of their own spaces and the collecting of their own trash after business; and zoning markets by products.

Significant improvements were observed In Houay Hong market from April to June. With regard to zoning, the market owner built an extension of the market to house poultry and other meat vendors together, and to provide enough space for the vegetable and fruit sections of the market. Addressing vendor table standards, the owner constructed 43 new tables following the standard size and height prescribed by the government market decree. Tables were lined with steel material that is easy to clean.

Display tables of meat vendors mixed with vegetable stalls

New tables and meat section constructed to separate meat and poultry products from fruits and vegetables

In Souanmone market, the market owner prioritized the following improvements: providing hand-washing stations with running water; providing waste disposal bins to encourage vendors to gather their trash; encouraging vendors to be visibly clean; meeting the standards for tables; and keeping the market floor clean and free of debris. To address the trash issue, the market owner added garbage bins for vendors to collect their trash. He purchased his own garbage truck to collect and dispose of garbage on a daily basis and avoid dependence on government garbage trucks that come irregularly. He demolished the old toilet area and built a new one with sinks and faucets for hand washing and a shower room if vendors need to take a shower and change clothes.

New trash bins

The old toilet building (left) while a new one is being constructed at the back.

The new toilet building

New hand washing sinks

New meat section

In Nong Niew market, the market administrator decided to prioritize: achieving the standards on keeping the market floor clean and having no debris on walkways; maintaining a clean waste disposal depot; meeting the standards for display tables; and zoning market products as recommended. Nong Niew market is seemingly the cleanest among the five pilot markets. The market owner encourages vendors to maintain the cleanliness of their own spaces because there are no additional fees collected for cleaning. He does not have regular vendor meetings, but makes announcements via the market public address system. However, in June, 2014, the market administrator and the district market monitor called a vendors meeting, which was also attended by PREVENT team in Lao PDR, to gather their opinions on proposed zoning/rearrangement of stalls in the market. No specific decisions were made at that time; this issue may require ongoing dialogue between the market administrator and vendors.

In That Luang market, the market administrator aimed for building a market that is a permanent structure. However, government registration for this market, which is privately owned and operated, will soon expire and the market owner expressed some hesitation about investing in a more costly structure. With regard to biosecurity, the market administrator wanted to achieve the following: maintaining clean drains that are free of debris; having trash and other waste disposed of properly after business hours; providing separate toilets for men and women; and building more permanent facilities for the market. At the beginning of Cycle 1, the market administrator labeled the toilets (one is for men and one for women). He also provided a hand-washing sink. Because the market ground was unpaved, the administrator decided to build the roof first to avoid the ground becoming muddy when rainy season arrived.

This zoning problem cannot be addressed until construction of the market roof is finished

Roof construction started in April and is ongoing

In Vang Vieng market, the market owner chose to focus on keeping market drainage clean; meeting specifications for display tables; providing information to vendors on sanitation, hygiene and infectious diseases; providing a separate space for live animals to be sold; and keeping live animal cages clean. To address these issues, the market administrator and district market monitor conducted several consultations. In April, 2014, both agreed to improve the tabletop used for meat vendors and to relocate the live poultry vendors so that live animals would be separate from the other products in the market. Live animals are now sold outside the market fence, and display tables for meat vendors were tiled.

The old cemented table of meat vendors lined with banana leaves

Tiled tables for meat vendors used only in the morning

Also in Vang Vieng, the District Industry and Commerce office embraced the program as a regular function of the office. The district governor, Mr. Unseng Keodavanh, issued a memorandum approving the creation of two market committees: 1) the executive and technical committee, which is composed of representatives from planning and finance, agriculture, health, police, the market owner, industry and commerce, and technology and science; and 2) the implementation committee, which is composed of people tasked with monitoring market activities.

Providing Technical Coaching to District Market Monitors and Administrators

Ms. Hoang Thuy, PREVENT Regional Advisor-BCC Interventions, met with trained market monitors from the five district departments of Commerce and Industry in Vientiane Capital and Vang Vieng District, Vientiane Province. She held coaching sessions and provided troubleshooting advice to address their difficulties in completion and timely submission of monitoring forms. She witnessed the vendors' consultation organized and facilitated by the Nong Niew market administrator and district monitor. The meeting was held to address vendor concerns on the planned zoning in the market. Eleven vendors (eight women and three men) represented the meat and poultry, vegetables, fruits, dry goods, and fish sections of the market.

Lessons Learned Forum

In August, PREVENT supported a lessons learned forum in Vang Vieng hosted by Vang Vieng District Governor Bounsone Phetlavanh. The forum allowed participants from pilot markets (market monitors from district Industry and Commerce departments and market owners and managers) to share their valuable observations, discuss challenges faced during the pilot implementation, and celebrate successes achieved in the short-term. Results of the meeting were for PREVENT to determine and plan for expansion of the activity to new markets in the coming year.

A total of 29 participants attended the forum (22 males and 7 females). Of this total, three were market owners from Vang Vieng market. There were also partners from NEIDCO, provincial and district departments of Health, Livestock, Environment, and the national Ministry of Industry and Commerce.

Improvement of the roofs and market floor of Souanmone market is ongoing.

Representatives from Houay Hong and Souanmone markets presented on experiences and challenges related to investing in capital improvements to market operations. These included structural improvements such as construction of new toilets and designating male and female toilets; improving market roofs; improving table surfaces and materials to facilitate cleaning; providing hand washing stations and a shower room for vendors; provision of new and additional garbage bins to improve garbage collection and disposal. Market managers and district monitors believe that improvement of market facilities will enable vendors to maintain the cleanliness of their markets.

Following each presentation, a plenary discussion was held. During the discussion, the benefits of serving as a pilot market were noted. Some benefits mentioned were attracting more customers to the market; promoting a cleaner market; promoting a good market that meets the government market decree; and boosting the reputation of a market that provides access to quality goods and products.

Market monitors from Nong Niew and That Luang shared their experiences in engaging vendors during market improvements. Together with vendors, the markets improved cleaning and hygiene practices such as cleaning of drains at the end of the day; cleaning of market floors throughout the day; cleaning and lining tables throughout the day; and collection and disposal of garbage on a regular basis.

A vendor cleans her own space.

Group discussions followed and highlighted the role, knowledge, and skills of the market monitors. It was noted that getting the cooperation of the vendors in sustaining the cleanliness of the markets may also depend on how the market monitors can engage the vendors.

The district officers of industry and commerce from Vang Vieng, Chanthabuly, and Sikhottabong noted that their respective district Governors had issued policy ordinances that created Market Committees. Such local policies are intended to bring together assigned individuals and concerned local departments to promote the sustainability of market monitoring for improvement.

As of the end of September, the district Governors of Saysettha and Sisattanak were in the process of drafting the ordinances to create their Market Committees. A Market Committee had also not yet been created by the district Governor of That Luang.

PREVENT project management together with NEIDCO awarded each of the pilot markets and district monitors the plaques of appreciation to recognize their initial commitment, support and efforts to continue market monitoring activities.
PREVENT will incorporate the experiences (challenges and successes) shared by the pilot participants into the work plan for the following year. One important consideration is to support market owners, managers and monitors in improving vendors' knowledge and to evaluate their effect on market improvements.

PREVENT learned from this initiative that some changes require more than just negotiation between market managers and vendors; they may require resources or participation of the surrounding communities or related government bodies, such as animal and/or human health officials. An example request from a quarterly meeting included educating vendors about hygiene, sanitation, food handling and food safety, zoning, and biosecurity in light of disease prevention. Initially, PREVENT resisted providing funding to support training sessions where a health and/or animal health officer would talk to a large group of vendors on two grounds: the unsustainability of such externally funded activities, and belief that a single non-participatory educational session is unlikely to stimulate a change in practices.

While improved knowledge is rarely a sufficient stimulus to effect changes in practice, it is sometimes necessary, particularly when the barrier to change is that people do not know that diseases can spread based on their specific practices. PREVENT will explore ways to help market managers access and establish ongoing relationships with local health and animal health staff who can address these knowledge gaps and other vendors' concerns. This will involve coaching both market managers and monitors in basic advocacy and in sensitizing health and animal health staff to the roles they can play in improving market biosecurity.

In addition, PREVENT will support providing simple job aids (e.g., a low-cost printed leaflet/poster with basic messages regarding hygiene, sanitation, food handling and food safety). PREVENT will introduce job aids in six (half) of the Monitoring for Market Improvement markets just before the second three-month monitoring cycle begins.

Forging Stronger Collaboration with the Lao PDR Government

FHI 360 pursued a continuing collaboration with the government through a signed memorandum of understanding for PREVENT project's implementation from May 2014 to May 2016. Signed on June 16, 2014, the agreement was made with the National Emerging Infectious Diseases Coordination Office (NEIDCO). NEIDCO is responsible for overall project coordination regarding emerging infectious diseases that emanate from animals and potentially infect humans. This office ensures collaboration and complementarity of efforts between the Ministries of Health, Agriculture, Forestry and Fisheries, and other relevant line ministries such as Industry and Commerce. The agreement underscores the implementation of the PREVENT project in selected provinces with support from USAID and DFAT.

Dr. Sitong Phiphachhawong (left) shakes hands with Dr. Anthony Bondurant (right)

Dr. Sithong Phiphachhawong, Deputy Director of NEIDCO and concurrently Deputy Director of the Department of Livestock and Fishery under the Ministry of Agriculture and Forestry, represented the Lao government, and Dr. Anthony Bondurant, FHI 360 Senior Director of Asia/Pacific Regional Programs, signed on behalf of FHI 360.

III. Knowledge Generation and Information Sharing

A. Knowledge Products

1. Traditional Communication

a. H7N9 Communication/Materials

In early 2014, PREVENT staff worked with FAO representatives to create strategies and products to respond to potential outbreaks of H7N9 avian influenza in the Mekong countries. This included drafting products and reviewing products developed by FAO.

After a delay of a few months while FAO continued development of materials, USAID asked PREVENT to review and provide recommendations on FAO's toolkit on H7N9 avian influenza, particularly focusing on any proposed approaches or language that has been shown to be ineffective in the past and should be avoided. PREVENT staff provided comments on each of the materials included in the tool kit, and noted that media should also be addressed. To that end, PREVENT drafted two press releases: one for market closures associated with a human case of H7N9, and one for market closures associated with detection of H7N9 in the market without a human case. PREVENT also provided recommendations on FAO's overall communication strategy, and enumerated several outstanding questions that should be addressed in communications.

b. Conference Outreach/Presentations

ASTMH

During this period, the American Society for Tropical Medicine and Hygiene accepted PREVENT's proposal to present a symposium at the ASTMH annual meeting on Nov. 2 to 6, 2014, in New Orleans.

The description of the symposium is as follows:

Opportunities for transmission of zoonoses from animals to humans depend on if, how, where, and when people interact with animals. This symposium will present data from a series of qualitative and quantitative studies that illustrate how social factors affect the human-animal interface and thus the risk of disease transmission. These studies, implemented by FHI 360's PREVENT project, were supported by multinational sources including USAID (as part of its Emerging Pandemic Threats Program) and the Australia DFAT. The first presentation will describe the conceptual model that informed the research: an expanded One Health framework that, in addition to incorporating the usual epidemiologic and ecologic factors, accounts for social and behavioral factors that affect human exposure and risk for diseases with zoonotic transmission. The following presentations will discuss the findings of two multi-country studies of human exposure to animals and two large-scale intervention trials. The second talk will use data from household surveys of adults and children that were conducted in Thailand, Lao PDR and Uganda. These studies demonstrate how potential risk, as measured by various types of exposure to animals, is affected by social factors such as ethnicity, age, and gender. The third talk uses data from rapid ethnographic assessments implemented in Thailand and Lao PDR; it will present details on methodologies that identify variations in how people accomplish activities such as hunting and food preparation. It will make the case that distinguishing these variations, which affect human exposure to rodents and bats and their pathogens, can help identify those at greatest risk of zoonotic disease. The final speaker will discuss the role of social science in developing two large-scale interventions to reduce the risk of Nipah virus transmission in Bangladesh. Results of these intervention studies will be presented.

The symposium will be chaired by Drs. Susan Zimicki and Stephen Luby (a collaborator from Stanford on the Bangladesh work), with presentations by PREVENT researchers Sara Woldehanna, Margaret Eichleay and Laura Seckel, as well as Nazmun Nahar, originally part of icddr,b and now affiliated with the Swiss Tropical and Public Health Institute.

Separate from the symposium, the following abstracts were also accepted for presentation at ASTMH:

- Markets as hubs of risky contact between humans and wild/domestic animals: Case studies from Republic of Congo (ROC) and Democratic Republic of Congo (DRC) by Dr. Zo Rambeloson.
- Characterizing exposure to bats and bat guano among men, women and children in Lao PDR to inform interventions for reducing the risk of zoonotic disease by Laura Seckel.

APHA

Also during this period, PREVENT was notified that two of its submitted abstracts were accepted for presentation at the American Association of Public Health Annual Meeting on November 15 to 19, 2014, in New Orleans. They are:

- A poster, "Factors contributing to emerging infectious diseases: Findings from a qualitative study in Uganda" by Sara Woldehanna
- An oral presentation, "Examining markets as locations at high risk of emerging pandemic threats: Example of markets in Brazzaville, Republic of Congo (ROC)" by Dr. Zo Rambeloson

Other Presentations

On August 20, 2014, PREVENT Senior Technical Officer Laura Seckel gave a presentation at a Zoology Seminar at the Smithsonian's Museum of Natural History. The presentation was entitled, "Animal Identification: Using photos to help us understand human exposure to bats and rodents in Lao PDR."

c. Journal Articles

During this period, PREVENT researchers began writing and submitting for technical review several manuscripts to be submitted to peer-reviewed journals. Topics for these articles-in-progress include the following:

- Human-animal interactions in Lao PDR
- Exposure to bats in Lao PDR
- Results of a rapid assessment on rodent exposure
- Ethnographic assessments of exposure to bat guano in Thailand
- Contact with rodents in Khon Kaen, Thailand

IV. Administrative and Financial Update

During the April to September 2014 time period, the administrative processing of contracts, purchase orders, and payments included:

- 66 consultant agreements
- 52 consultant agreement modifications
- 17 purchase orders
- 32 purchase order modifications, and
- 175 payments to vendors and consultants.