FOLK KNOWLEDGE ABOUT AVIAN INFLUENZA AND THE USE OF PERSONAL PROTECTIVE EQUIPMENT: A QUALITATIVE STUDY

Ratana Somrongthong[1,*], Amanda L. Beaudoin[2], Sunitra Pakinsee[1] and Chitr Sitthi-amorn[1]

[1]College of Public Health Sciences, Chulalongkorn University, Pathumwan, Bangkok 10330 Thailand
[2]Department of Population Medicine, College of Veterinary Medicine, University of Minnesota, USA.

ABSTRACT: Avian influenza (Al) outbreaks in Thailand from January 2004 to December 2005 resulted in 22 human cases, and 14 deaths. Three confirmed cases were reported in Suphanburi Province in 2004, one of whom died. Based on experiences if AI in Suphanburi, this study aimed to assess and describe the nature of local residents' knowledge about AI and identify their perceived benefits and barriers to the use of personal protective equipments (PPE). Four focus group discussions (FGD) with 38 participants in high and low infectivity areas were organized. In addition, ten in-depth interviews in high and low infectivity areas were conducted. Most of these cases were correlated with raising poultry or direct contact with dying poultry. The findings revealed that almost all of the participants perceived the cause of AI to be from wild birds and/or migratory birds. There are differences in local knowledge and beliefs between participants in high and low infectivity areas. The participants in high infectivity areas have more knowledge than the participants in low infectivity areas. Some of the participants in low infectivity areas believed that AI is caused by mosquitoes, wind, air and water. The use of PPE (gloves) is low among participants of all ages and types of poultry owned. Most use plastic bags instead of gloves to handle dying poultry. The benefits of using PPE (gloves, including plastic bags) related more to protection from odors rather than protection from AI transmission. The potential barriers to PPE use were related to cultural factors, lack of knowledge, comfort, availability and cost. This study suggested that public health professionals should promote the use of PPE and hand washing by raising their awareness.

Keywords: Folk knowledge, Avian Influenza, Use of personal protective equipments, Qualitative study

INTRODUCTION: Avian influenza (Al) outbreaks in Thailand from January 2004 to December 2005 resulted in 22 human cases and 14 deaths1). Chulalongkorn University, comprising the College of Public Health Sciences, Faculty of Veterinary Sciences and Faculty of Medicine in collaboration with the University of Minnesota, USA, has conducted a research project entitled Influenza A Infections at the Human Animal Interface. The project aims to gain better understanding of the epidemiology and transmission of infection in provinces where there have been repeated epidemics, and to achieve more effective disease prevention and control. The project adopted multidisciplinary approaches for data collection, including qualitative, quantitative and laboratory investigation. Suphanburi Province was purposively selected for the study because it was the location of the first human case of H5N1 confirmed by the Ministry of Public Health. Three confirmed cases were reported in 20042), one of whom died. Based on experiences of AI in Suphanburi, this study aimed to assess and describe the nature of local residents' knowledge about AI and identify the perceived benefits and barriers to the use of personal protective equipments (PPE). The World Health Organization recommends the use of Personal Protective Equipment (PPE) and hand washing as effective measures for infection prevention and to control the spread of disease). PPE items include gloves, masks,

* To whom correspondence should be addressed.
E-mail: sratana3@chula.ac.th

boots and protective clothing. To gain a more in-depth understanding of the folk knowledge and the perceived benefits and barriers to the use of PPE, a qualitative study was conducted. This qualitative study, comprised of focus group discussions (FGD) and in-depth interviews (IDI), is supplementary to a larger study survey and is conducted to improve the understanding of the underlying reasons for reported behaviors and practices related to the use of PPE for avian influenza prevention and control.

MATERIALS AND METHODS: The district and subdistrict selection described here reflects that which was conducted for the larger overhead study. Within Suphanburi Province, participating districts were chosen based upon their outbreak experience during the third wave of highly pathogenic avian influenza A (HPAI) from July through November 20054). Of the six districts that were affected, the two most affected districts (Muang and U Thong) were specifically selected for this study. In each district, one sub-district was identified which had experienced three or more waves of poultry outbreaks (or high infectivity areas) and had the most reported chicken deaths. Within each of these two high infectivity districts, one sub-district was chosen based upon having the greatest number of chicken deaths , as well as the willingness of local health officers to cooperate. Matching on population size and density, number of villages, and agricultural occupations, we selected one more sub-district in each district that had experienced less than two waves of AI poultry outbreaks (or low infectivity areas). For this FGD and IDI sub-study, one high infectivity sub-district (in U Thong District) and one low-infectivity subdistrict (in Muang District) was selected.

Data collection for this study took place in focus group discussion (FGD) and in-depth interviews (IDI). Within the subdistricts, the FGD and IDI participants were recruited using a snowball sampling technique. This technique utilizes referral chains to identify study participants. In this study, participants were identified by local health officers, village health volunteers and village leaders. The criteria for participation in the FGD was currently owning poultry of any kind (July, 2008) or having owned poultry at the time of the H5N1 outbreaks during the third wave of HPAI (July-November 2005).

The question guides for FGDs and IDI were developed based on the Health Belief Model5), as the Health Belief Model has been very influential in the area of health education in Thailand6). The FGD guides were written to explore perceptions of the causes of AI in poultry, the perceived severity of AI, and perceived benefits/ barriers to PPE use. After securing permission from the participants, all conversation during FGDs and IDIs was audio recorded. Transcripts were created from the audio recordings, and the transcriptions were coded to identify emergent themes by the researchers.

RESULTS: Two FGDs in high-infectivity areas and two FGDs in low-infectivity areas were organized. A total of 32 poultry owners participated in FGDs. Eighteen participants (56.3%) were from high-infectivity areas and were between the ages of 37-79 years. Fourteen participants (43.7%) were from low-infectivity areas with and age range of 25-81. Most of them are rice farmers (75.0%). During the study period, almost all of them were raising the poultry. The majority raised backyard chickens. A few of them raised both backyard chickens and ducks. Two of them raised fighting cocks and one raised grazing ducks. Some of the participants stated that they raised backyard chickens for food and for the ritual. The rituals usually related to paying respects or make offerings to god/ghost/spirit for their crop products. For example, informing ghost/spirit for growing rice, for harvest, asking for rain, and so on. These mentioned rituals require that the chicken be steamed with liquor. Therefore the backyard chickens are needed 2-3 times per year. Most of them stated that they refuse to buy chicken from the market as it not fresh enough for the ritual. Most participants' activity related to poultry is feeding. During the AI outbreak, eleven of the participants in the high-infectivity areas and eleven participants in the low-infectivity areas were faced with poultry death.

FGD participants' characteristics

Sex	FGDs		Total
	High-infectivity area	Low-infectivity area	
Male	*8*	*10*	*18*
Female	*10*	*4*	*14*
Total	**18**	**14**	**32**
Age range	37-79 yrs.	25-81yrs.	

Ten IDIs were conducted. Five participants resided in the high AI infectivity areas and were aged between 36 - 59. Another five participants resided in the low AI infectivity areas and were aged between 41-68 years. The participants included six villagers, two village health volunteers and two community leaders. Almost all of them raised backyard chickens. Two of them raised grazing ducks. Most participants' activity related to poultry was feeding. During the AI outbreak, all of them were faced with poultry death.

IDI participants' characteristics

	IDIs		
Sex	**High-infectivity area**	**Low-infectivity area**	**Total**
Male	*3*	*4*	*7*
Female	*2*	*1*	*3*
Total	**5**	**5**	**10**
Age range	*36-59*	*41-68*	

Perceived Causes of AI in Poultry

All of the participants both high and low infectivity areas defined the Avian Influenza (AI) or 'Kai Wad Nok' in Thai, meaning 'Bird Influenza'. Most of them perceived that migratory birds and wild birds were cause of AI in poultry.

Male, aged 37 (FGD, high infectivity areas) "Migratory birds fly from place to place, they bring AI, but our chickens, they are at home, therefore the AI cause from the wild bird and migratory bird"

Male, aged 58 (IDI, high infectivity areas): "Bird Flu is the disease that the Asian open bill stork carry the avian flu viruses. These viruses were blown away in the air and our poultries got affected.

However few of them had no idea about the relation of transmission between a bird and their poultries.

Female, aged 53 (FGD, low infectivity areas): ".... I am, sometimes afraid getting infected with AI, however, I have no idea about what are the mode of transmission"

Interestingly, the participants in the low AI infectivity areas had different perceptions regarding the causation of AI in poultry when compare with the high infectivity areas. For example, they perceived that AI was caused by air, wind, water, mosquitoes and grazing ducks.

Male, aged 45 (FGD, low infectivity areas): "AI by wind, when it happen all chicken died with black face. I don't know how it is happen. I just wonder on this disease (AI), it is called 'bird flu' but mostly chicken died.... not birds."

Male, aged 25 (FGD, low infectivity areas): "....migratory birds migrate for food and water around our community. Our chickens in the community were contaminated with the water and secretion of those migratory birds."

Male, aged 70 (FGD, low infectivity areas): "....chicken died due to mosquitoes bite, as I observe most of chickens live in the mosquitoes net safer than the chicken live outside mosquitoes net".

Perceived Severity of AI

Some participants in the high infectivity areas perceived that AI is a severe disease as it causes massive poultry death. In addition, it leads to death of human beings. However, few believed that AI can be prevented with vaccine.

Male, aged50 (FGD, high infectivity areas): "AI is very severe because of massive numbers of bird deaths if it occurs"

Female, aged 47 (FGD, high infectivity areas): "...I am afraid of AI if someone infected, he/ she will die"

Male, aged 56 (FGD, high infectivity areas): "...I think AI can be prevented with vaccine"

In contrast, the participants in the low infectivity areas have less concern about the severity of AI

Male, aged 70 (FGD, low infectivity areas): "...I have been raising the chicken for many years so I do not think that I can get infected with AI by contacting the chicken."

Male, aged 58 (IDI, high infectivity areas): "...I am afraid of AI because this disease can kill a flock of chicken or duck so it might kill human as well.

Few of the participants in the low infectivity areas belief that AI can be prevented with vaccine or "germ killer medicines" (antibiotics)

Female, aged 40 (FGD, high infectivity areas): ".... I think AI can be prevented with vaccine or germ killer medicines"

Use of the Personal Protective Equipments (PPE)

Most of the participants both in high and low infectivity areas did not use gloves with their poultry during the study period in 2008. They also had low awareness of the AI outbreak.

Female, aged 48 (FGD, low infectivity areas): "Using gloves is unnecessary for people in upcountry. We live in rural area, we have simple life."

Male, aged 70 years (FGD, low infectivity areas): "I didn't use gloves as I think it is not necessary, I didn't touch much the poultry"

Male, aged 65 (IDI, low infectivity areas): "I have never used any gloves or mask because I do not touch or contact the chicken directly. I just throw the steamed rice to them (feeding).

However, the participants in the high infectivity areas mentioned that during the AI outbreak in 2005 some of them used gloves or plastic bags especially for culling and carrying the dead chickens/ducks. Some of them used plastic bags only for their own dying birds, but they did not use for neighbors'. The participants in the low infectivity areas mentioned that they usually used plastic bags instead of gloves. It was used because of smell rather than protection of the AI transmission. Moreover the quality of bags was not assessed, some bags were leaking or torn.

As mentioned earlier, some participants raised backyard chickens for rituals. Those rituals related to paying respects or making offerings to god/ghost/spirit for their crop products. They usually culled their backyard chickens 2-3 times per years. Most of them stated that they did not use gloves or plastic bags. The reasons for not using gloves or plastic bags were that they were unnecessary or that participants perceived that their chickens were free from diseases.

Male, aged 62 (IDI, low infectivity areas): "culling my chickens, it is not necessary to use gloves. My chickens are free from disease."

The benefits and barrier to PPE used

The benefits of using PPE

The majority of participants realized the benefits of the use of PPE. They learnt how to use PPE from the village health volunteers (VHVs), health personal. Interestingly, we found that a few participants used PPE regularly. In addition, a few perceived the benefit of use PPE (gloves or plastic bags) to relate to smell rather than protection of the AI transmission. Participants realized the benefits of using PPE (*gloves or mask*)as it can protect them from AI, however, they did not use it.

Male aged 56 (FGD, high infectivity areas): "I covered my hands with plastic bags when I had to carry the dead birds and buried them because I was afraid of the smell."

Male aged 45 (FGD, low infectivity areas): "It is good that other people protected themselves by using gloves or mask when they contact their poultries. However, I do not wear any gloves or mask."

The barriers to use of PPE

The reasons for not using PPE, especially gloves, in both low and high AI infectivity areas related to availability, cost, and complications with use, comfort and not being a normal part of life. Moreover, in the low AI infectivity areas mentioned, participants did not use gloves because of forgetfulness, laziness, unfamiliarity, not being necessary, weather too hot to wear gloves, and not appropriate to the rural culture.

Male aged 60 (FGD, low infectivity areas): "Using PPE is complicated. It is not simple way of life for rural people."

Male aged 51(FGD, low infectivity areas): "I saw my neighbors wore the gloves when they feed their chicken. They seem worried too much about their hygiene."

Male, aged 56 (FGD, low infectivity areas): "I used to wear the gloves whole carrying ducks but it was uncomfortable. Bare hands are more convenient."

Female, aged 41 (IDI, low infectivity areas): "It's complicated. We just fed the chicken without touching them. We wanted to use the rubber gloves are difficult to find and costly. However, if we get them for free, we will use them during the outbreak or the campaigns only"

Male, aged 45 (FGD, low infectivity areas): "I do not like wearing the gloves or a plastic bag when carrying the chicken because it is too hot but I always wash the chicken blood from my hands after slaughtering...not because of AI awareness."

Sources of AI information

Most of the participants from both high and low infectivity areas have received AI information from various sources including village health volunteers (VHV), television,

newspaper, health office, people talking in the village. However they prefer to get information from VHV or village headmen. In addition, they would like to get more information as they currently have poultry at home and the participants were afraid of the approaching winter. They believed that flu and AI occur during winter.

Limitations

A limitation of this qualitative study is the findings are unable to generalize about a broader population. Therefore, the researchers acknowledge that the findings pertain to our targeted subjects. It means that the experiences of these subjects may not adequately describe the experience of all villagers who raise poultry.

DISCUSSION: AI outbreaks are considered to be threats to national economic growth and, as such, require policy attention and research funds. The Thai Government has made a considerable effort in promoting prevention and control of AI transmission, including health education for poultry owners[7]. In order to create and implement effective interventions to combat AI transmission, an understanding of local perspectives and responses to AI is needed[8]. This study employed qualitative interview and focus group methods to gather and describe rural villagers' knowledge of AI and use of PPE. The findings reveal that all participants both high and low infectivity areas defined the Avian Influenza (AI) as 'Kai Wad Nok' in Thai, meaning 'bird influenza'. Most of them perceived that migratory birds and wild birds were cause of AI in poultry. However, a few of them had no understanding of the potential of transmission between wild birds and their poultry. Interestingly, the participants in the low AI infectivity areas had different perceptions regarding the causation of AI in poultry when compared with those in high infectivity areas. For example, they perceived that AI is caused by air, wind, water, mosquitoes and grazing ducks.

Moreover, there are differences in local knowledge and beliefs between participants in high and low infectivity areas. The participants in high infectivity areas have more knowledge than the participants in low infectivity areas. It might be that the participants in the high infectivity areas were often exposed to researchers and health personals during the AI outbreak. This finding is similar to a study in Israel which found that the sense of knowledge was significantly higher in the affected AI areas compared to the nation as a whole[9]. The participants in the high infectivity areas perceived that AI is a severe disease as it is a cause of massive poultry death and its leads to the death of human beings. In contrast, the participants in the low infectivity areas were less concerned about the severity of AI.

While a few participants used PPE regularly, the use of PPE is low among participants of all ages and types of poultry owned. This is despite the finding that the majority of the participants recognized the benefits of PPE. Knowledge regarding the use of PPE was obtained most frequently from VHVs and health personnel, a finding consistent with several other studies[10,11,12]. The reported barriers to PPE-use focused around cultural, informational and socio-economic factors. The reasons given for not using PPE, especially gloves, in both low and high AI infectivity areas are that PPE is costly, largely unavailable, complicated to use, uncomfortable and is not a normal part of daily life. Some participants also mentioned they did not use gloves because of forgetfulness or laziness. In some cases, a less costly and more available substitute, such as a plastic bag, was used instead of more traditional form of PPE.

The findings of this study suggest that public health professionals should promote the use of PPE by raising awareness of their uses and benefits. in addition, to improve present health education regarding AI prevention and control, consideration should be extended beyond the health belief model to find innovative approaches to developing education messages for specific local situations. For example, the participants indicated that gloves were not readily available and were costly, so they used plastic bags instead. They also stated that they tried to avoid direct contact with their poultry because they were afraid of AI transmission, however, they never mentioned regular hand washing after contact with poultry. Based upon these findings, a campaign promoting regular hand washing after poultry-related activities, as well as assessment of the integrity of plastic bags (to make sure that there are no holes) could be very effective among some rural Thai people.

ACKNOWLEDGEMENTS: The authors wish to thank to the University of Minnesota and the Centers for Disease Control (CDC) and Thailand Research Fund (TRF) Senior

Research Scholar for providing research funds of this study.

REFERENCES:

1. Ministry of Public Health. 2006. Ministry of Public Health confirms the third case of H5N1 in human of this year. from http://thaigcd.ddc.moph. go. th/ AI _ pressrelease_060925_En.html

2. Bureau of Epidemiology, Ministry of Public Health, Thailand, 2004. Epidemiology report. (Thai version)

3. World Health Organization. 2008. WHO Interim Infection Control Guideline for Health-care Facilities. from:http://www.who.int/csr/ disease/ avian_influenza/ guidelines/infectioncontrol1/en/index.html

4. Department of Livestock Development [DLD]. 2005. Avain Influenza situation and control measures. Retrived March 15, 2007, from http://www.dld.go.th/ home/bird_flu/livestock_by_don/

5. Strecher, VJ., Rosensrtock, IM,. 1997. The Health Belief Model. In: Glanz.K., Lewis et.al. (Eds.), Health Behaviour and Health Education. Jossey-Bass Publishers. USA.

6. Phuanukoonnon S, Brough M, Bryan JH. 2006. Folk knowledge about dengue mosquitoes and contributions of health belief model in dengue control promotion in Northeast Thailand. Acta Trop. 99(1):6-14.

7. Bureau of Epidemiology, Ministry of Public Health, Thailand, 2005. Epidemiology report. (Thai version)

8. Cheungsatiansup K. 2008. Ethnography of epidemiologic transition: avian flu, global health politics and agro-industrial capitalism in Thailand. Anthropology and Medicine 15:53-59.

9. Rami P., Galit A. and Yaron B. 2007. Differences in public emotions, interest, sense of knowledge and compliance between the affected area and the nationwide general population during the first phase of a bird flu outbreak in Israel. Journal of Infection 55: 6. p. 545-550.

10. Miner, S D., 2007. Capacity for Early Detection, Responses to and Practices of Villagers in Relation, Diagnosis and Surveillance of Hihgly Pathogenic Avian Influenza (HPAI) in Suphanburi, Thailand. Master Degree of Public Health. College of Public Health, Chulalongkorn University, Thailand.

11. Yooyim, S. 2007 Knowledge Attitude and Practice for AI prevention and Control among Village Health Volunteer and Villagers , Tumbol Tasoa, Ampure Muang, Uttradit. (Thai version)

12. Maton T., Butraporn P,. 2008. Preventive and Controlling Behaviors of Avian Influenza and Relationship among People in Risk Areas, Song Phi Nong District, Suphan Buri Province. Journal of Public Health. 38; 1. January – April 2008.