DEVELOPMENT OF A COMMUNITY - BASED MODEL TO PREVENT AVIAN INFLUENZA IN SONG PHI NONG DISTRICT, SUPHAN BURI PROVINCE, THAILAND

TAVORN MATON

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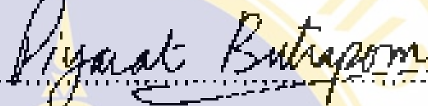
DEVELOPMENT OF A COMMUNITY-BASED MODEL TO PREVENT AVIAN INFLUENZA IN SONG PHI NONG DISTRICT, SUPHAN BURI PROVINCE, THAILAND

....

Tavorn Maton

Candidate



....

Assoc. Prof. Piyarat Butraporn, D.V.M., D.A.P. & E., M.P.H., M.P.H., Dr.P.H.

Major-Advisor

....

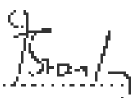
Assoc. Prof. Wijitr Fungladda, M.D., D.T.M. & H., M.P.H., Dr.P.H.

Co-Advisor

....

Assist. Prof. Jaranit Kaewkungwal, B.Sc., M.Ed., M.A., Ph.D. (Applied Statistics & Program Evaluation)

Co-Advisor



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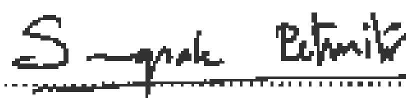

....

Assoc. Prof. Songsak Petmitr Ph.D. (Biochem),

Chair

Doctor of Philosophy Program in Tropical Medicine

Faculty of Tropical Medicine

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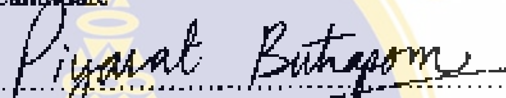
Tavorn Maton

Candidate



Assoc. Prof. Piyarat Butraporn, D.V.M., D.A.P. & E., M.P.H., M.P.H., Dr.P.H.

Chair

Assoc. Prof. Wijitr Fungladda, M.D., D.T.M. & H., M.P.H., Dr.P.H.

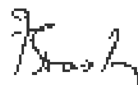
Member

Assist. Prof. Jaranit Kaewkungwal, B.Sc., M.Ed., M.A., Ph.D. (Applied Statistics & Program Evaluation)

Member

Thanawat Insomboon, B.Sc.(Health Education), M.P.H. & Social Medicine, D.A.P. & E., Dr. P.H.

Member



Prof. M.R. Jisnuson Svasti, Ph.D.

Dean

Faculty of Graduate Studies

Mahidol University

Assoc. Prof. Pratap Singhasivanon, M.B.B.S., D.T.M. & H., M.P.H., Dr. P.H. (Epidemiology)

Dean

Faculty of Tropical Medicine, Mahidol University

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Tavorn Maton

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DEVELOPMENT OF A COMMUNITY-BASED MODEL TO PREVENT AVIAN INFLUENZA IN SONG PHI NONG DISTRICT, SUPHAN BURI PROVINCE, THAILAND

TAVORN MATON 4437515 TMTM/D

Ph. D. (TROPICAL MEDICINE)

THESIS ADVISORS: PIYARAT BUTRAPORN, D.V.M., M.P.H., M.P.H., Dr. P.H., WIJITR FUNGLADDA, M.D., D.T.M.&H., M.P.H., Dr. P.H., JARANIT KAEWKUNGWAL, B.Sc., M.Ed., M.A., Ph.D.

ABSTRACT

Avian influenza (AI) is an infectious disease spread among poultry and transmitted to humans by contacting infected or dead animals. In Thailand, the cumulative prevalence of AI (January 2004 to December 2005) was 22 cases and 14 deaths. Three confirmed cases were reported in Suphan Buri in 2004. Outbreaks of AI among poultry remain endemic at present. The study design is an action research to initially explore knowledge, attitudes and practices (KAP) about avian influenza among the population, and later, to implement a prevention and control program based on a community participation approach. The initial survey interviewed 784 subjects sampled by multi-stage random sampling from 14 sub-districts in Song Phi Nong District, Suphan Buri Province, located 80 kms northwest of Bangkok. The quantitative results showed that 85.1% of the study subjects had a moderate level knowledge (7-12, of a total of 18 scores) and practices (10-20, of a total of 30 scores) in the prevention and control of AI and 98.9% had highest positive attitudes (35-51, of a total 51 scores) towards AI prevention and control. Family income was significantly related to attitudes and behaviors (χ^2 = 8.267, P = 0.016). Educational level was significantly related to knowledge of disease (χ^2 = 9.486, P = 0.009). Having children and/or elderly in family were significantly related to practices (χ^2 = 7.062, P=0.029). Received information was significantly related to knowledge (χ^2 = 4.322, P = 0.001), attitudes (χ^2 = 25.388, P = 0.001) and practices (χ^2 = 14.163, P = 0.001). Raising and killing domestic poultry for consumption in family were significantly related to practices (χ^2 = 80.415, P = 0.001; χ^2 = 10.187, P = 0.006, respectively).

The second stage of the study was an implementation conducted in a selected village, Ban Vang Ta Ku, Thung Khok Sub-district, under the community-based empowerment program (CBEP). The program emphasized KAP for AI, personal and family protection and increased self-efficacy, and self-esteem, for 24 key community stakeholders and 199 household representatives. The program trained the community stakeholders in self-efficacy for this active, participative learning process. Workshops and training were organized twice onsite at the start of implementation, and at one week. The latter was based on participatory learning action for personal knowledge of AI prevention, farming protection, surveillance and report of disease occurrence, and a community campaign. The community stakeholders had self-assignments and continued working with 199 households in their geographic area. The study evaluated the program by conducting two data collections, with baseline and final data collections in both groups (24 stakeholders and 199 householders).

The program was quite successful, with KAP levels for AI, hand washing with soap behaviors, self-efficacy, and necessary perception of prevention and control, significantly higher than before the implementation. Householder satisfaction and participation in the activities had higher levels to the project activities (98.3 and 80.9%, respectively). Logistic regression analysis suggested that self-efficacy score, practice score, and factors of raising poultry, and learning information predicted increased chance of program participatory activities.

Results of the study can be applied with other communities having a high incidence of AI. Knowledge, attitudes, practices, information, and learning experiences gained from the study are helpful in developing AI prevention and control programs. Furthermore, the study model affected a reduction in the incidence rate, and promoted AI-preventive behaviors.

KEY WORDS: AVIAN INFLUENZA / AVIAN FLU / KAP / EMPOWERMENT / COMMUNITY PARTICIPATION / COMMUNITY-BASED APPROACH / STAKEHOLDER / SELF-EFFICACY / KEY COMMUNITY / THAILAND

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การพัฒนารูปแบบการป้องกันโรคไข้หวัดนกโดยใช้ชุมชนเป็นฐาน ในอำเภอสองพี่น้อง จังหวัดสุพรรณบุรี ประเทศไทย
(DEVELOPMENT OF A COMMUNITY-BASED MODEL TO PREVENT AVIAN INFLUENZA IN SONG PHI NONG DISTRICT, SUPHAN BURI PROVINCE, THAILAND)

ถาวร มาต้น 4437515 TMTM/D
ปร.ด. (อายุรศาสตร์เขตร้อน)
คณะกรรมการควบคุมวิทยานิพนธ์ : ปิยะรัตน์ บุตราภรณ์, D.V.M., M.P.H., M.P.H., Dr.P.H.,
วิจิตร ฟุ้งลัดดา, M.D.,D.T.M.& H., M.P.H., Dr.P.H.,
จรณิต แก้วกังวาล, B.Sc., M.Ed., M.A., Ph.D.

บทคัดย่อ

ไข้หวัดนกเป็นโรคติดเชื้อในสัตว์ และติดต่อสู่คนโดยการสัมผัสกับสัตว์ที่ติดเชื้อหรือสัตว์ตาย ประเทศไทยมีผู้ป่วยไข้หวัดนกสะสม นับตั้งแต่เดือน มกราคม 2547 จนถึง ธันวาคม 2548 จำนวน 22 คน ซึ่งตายไป 14 คน ทุกครั้งที่มีการระบาดเกิดขึ้นในสัตว์ปีก มักจะมีการระบาดติดต่อสู่คนเสมอ ในปี 2547 จังหวัดสุพรรณบุรี มีผู้ป่วยไข้หวัดนกที่มีผลการตรวจจากห้องปฏิบัติการยืนยัน 3 ราย ปัจจุบัน การระบาดของไข้หวัดนกในสัตว์ปีกยังคงเกิดขึ้นอยู่อย่างต่อเนื่อง การวิจัยนี้เป็น Action Research ซึ่งเริ่มโดยการสำรวจความรู้ ทัศนคติ และการปฏิบัติตนเกี่ยวกับไข้หวัดนกของประชาชน และดำเนินงานโครงการป้องกันและควบคุมโรคโดยเน้นการมีส่วนร่วมของชุมชน กลุ่มตัวอย่างที่ถูกสัมภาษณ์จำนวน 784 คน ถูกสุ่มมาจาก 14 ตำบล โดยวิธี Multi-stage random sampling ในอำเภอสองพี่น้อง จังหวัดสุพรรณบุรี ซึ่งอยู่ห่างจากกรุงเทพ ฯ 80 กิโลเมตร ผลการศึกษาพบว่าร้อยละ 85.1 ของกลุ่มตัวอย่างมีความรู้ (7-12 คะแนน จากคะแนนเต็ม 18 คะแนน) และการปฏิบัติตน (10-20 คะแนน จากคะแนนเต็ม 30 คะแนน) เกี่ยวกับการป้องกันและควบคุมไข้หวัดนกในระดับปานกลาง ร้อยละ 98.9 ของกลุ่มตัวอย่างมีทัศนคติในทางบวก (35-51 คะแนน จากคะแนนเต็ม 51 คะแนน) เกี่ยวกับการป้องกันและควบคุมโรค รายได้ครอบครัวมีความสัมพันธ์กับทัศนคติและการปฏิบัติตน ระดับการศึกษามีความสัมพันธ์กับระดับความรู้ การมีเด็กหรือผู้สูงอายุในครอบครัวมีความสัมพันธ์กับการปฏิบัติตน การได้รับข้อมูลข่าวสารมีความสัมพันธ์กับระดับความรู้และการปฏิบัติตน การเลี้ยงและการฆ่าสัตว์ปีกเพื่อการบริโภคในครอบครัวมีความสัมพันธ์กับการปฏิบัติตนอย่างมีนัยสำคัญทางสถิติ ในระยะที่สองเป็นการวิจัยเชิงปฏิบัติการ ภายใต้โปรแกรมการสร้างพลังโดยใช้ชุมชนเป็นฐาน (Community-Based Empowerment Program) ในหมู่บ้านที่ถูกคัดเลือกได้แก่ บ้านวังตะกู ตำบลทุ่งคอก โปรแกรมนี้เน้นให้ความรู้ ทัศนคติ และการปฏิบัติ ทั้งในระดับบุคคลและครอบครัว รวมถึงการเพิ่ม self-efficacy และ self-esteem แก่แกนนำหมู่บ้าน 24 คน และตัวแทนหลังคาเรือน 199 คน โดยการให้ความรู้แก่คนในชุมชนเพื่อให้เกิดการเรียนรู้และความเชื่อมั่นในการทำกิจกรรมร่วมกัน ซึ่งได้จัดประชุมเชิงปฏิบัติการและการอบรม 2 ครั้ง ครั้งแรกและครั้งที่สองห่างกัน 1 สัปดาห์ โดยการเรียนรู้แบบมีส่วนร่วมเกี่ยวกับการป้องกันโรคไข้หวัดนกในคน ในสัตว์เลี้ยง การเฝ้าระวังและรายงานการเกิดโรค และการรณรงค์ให้ความรู้ในชุมชน แกนนำหมู่บ้านได้รับมอบหมายให้ทำงานร่วมกับ 199 หลังคาเรือนอย่างต่อเนื่องในเขตรับผิดชอบของตนเอง การศึกษานี้ประเมินผลโดยการเก็บรวบรวมข้อมูล 2 ครั้งคือ ก่อน และหลังดำเนินงานโครงการทั้งในกลุ่มแกนนำ 24 คน และตัวแทนหลังคาเรือน 199 คน โปรแกรมการศึกษานี้ประสบความสำเร็จทุกด้านทั้งระดับความรู้ ทัศนคติ และการปฏิบัติเกี่ยวกับไข้หวัดนก พฤติกรรมการล้างมือด้วยสบู่ การรับรู้ความสามารถแห่งตน การรับรู้ความจำเป็นในการป้องกันและควบคุมโรคไข้หวัดนก ทั้งหมดมีคะแนนเฉลี่ยสูงขึ้นกว่าก่อนการทดลองโปรแกรมอย่างมีนัยสำคัญทางสถิติ ตัวแทนหลังคาเรือนมีความพึงพอใจและมีส่วนร่วมในกิจกรรมการป้องกันและควบคุมไข้หวัดนกสูง (ร้อยละ98.3 และ 80.9 ตามลำดับ) ผลการศึกษานี้ สามารถนำไปใช้ในชุมชนอื่นที่มีอุบัติการณ์ไข้หวัดนกสูง รวมถึงความรู้ ทัศนคติ การปฏิบัติ ข้อมูลข่าวสารและประสบการณ์ที่ได้รับจากการศึกษานี้จะช่วยในการพัฒนาโปรแกรมการป้องกันและควบคุมโรคไข้หวัดนกได้ นอกจากนั้นรูปแบบการศึกษานี้ ยังมีผลต่อการลดอัตราอุบัติการณ์และส่งเสริมพฤติกรรมการป้องกันไข้หวัดนกได้เป็นอย่างดี

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LIST OF ABBREVIATIONS

AGPT	Agar Gel Precipitation Test
AI	Avian Influenza
ARDS	Respiratory Distress Syndrome
CBEP	A Community-based Empowerment Program
CDC	Centers for Disease Control
CP	Community Participation
CS	Community Stakeholders
DLD	Department of Livestock Development
EU	European Union
GI	Gastro-intestinal
HA	Hemagglutinin
H5N1	HA 5 Protein, NA 1 Protein
HPAI	Highly Pathogenic Avian Influenza
KAP	Knowledge, Attitude, Practice
LPAI	Low Pathogenic Avian Influenza
MCA	Multiple Classification Analysis
NA	Neuraminidase
ND	Newcastle Disease
OIE	Office of International Epizootics
PCR	Polymerase Chain Reaction
PLA	Participatory Learning and Action Technique
RPA	Rapid Participatory Appraisal
TAO	Tambon Administration Organization
U.S.	United States of America
VH	Village Headman

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LIST OF ABBREVIATIONS (Cont.)

VHVs	Village Health Volunteers
WHO	World Health Organization
B.E.	Buddhism Era
PPE.	Personal Protective Equipment

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CHAPTER I

INTRODUCTION

1.1 RATIONALE OF THE PROBLEM

Influenza viruses that infect birds are called "avian influenza viruses." Only influenza A viruses infect birds. All known subtypes of influenza A virus can infect birds. However, there are substantial genetic differences between the subtypes that typically infect both people and birds. Within subtypes of avian influenza viruses there are also different strains.

Avian influenza H5 and H7 viruses can be distinguished as "low pathogenic" and "high pathogenic" forms on the basis of genetic features of the virus and the severity of the illness they cause in poultry; influenza H9 virus has been identified only in a "low pathogenic" form. Each of these three avian influenza viruses (H5, H7, and H9) can theoretically be partnered with any one of nine neuraminidase surface proteins; thus, there are potentially nine different forms of each subtype (e.g., H5N1, H5N2, H5N3…H5N9).

Influenza A viruses are found in many different types of animals including ducks, chickens, pigs, whales, horses, and seals. However, certain subtypes of influenza A viruses are specific to certain species, except for birds which are hosts to all subtypes. Subtypes that have caused widespread illness in people either in the past or in the current period are H3N2, H2N2, H1N1, and H1N2. H1N1 and H3N2 subtypes have caused outbreaks in pigs and H7N7 and H3N8 viruses have caused outbreaks in horses.

Influenza A viruses normally seen in one species sometimes can cross over and cause illness in another species. For example, up until 1998, only H1N1 viruses circulated widely in the U.S. pig population. However, in 1998, H3N2 viruses from humans were introduced into pig population and caused widespread disease among pigs (1).

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Avian influenza viruses may be transmitted to humans in two main ways:

- Directly from birds or from avian virus-contaminated environment
- Through an intermediate host, such as pigs.
- Airborne transmission

Influenza pandemic is a global outbreak of influenza and occurs when a new influenza A virus emerges among people, spreads, and causes disease worldwide. Past influenza pandemics have led to high levels of illness, death, social disruption and economic loss (1).

Normally, the disease is not easily transmitted from infected birds to humans. However, direct or close contact with infected poultry may cause infection. The infection of humans with an avian influenza virus was first documented in 1997 when an outbreak occurred in poultry population in Hong Kong. Avian influenza caused by some subtypes of influenza virus normally infects or circulates in bird populations. Certain species of bird are the natural reservoir of avian influenza viruses. The virus may be spread to domestic poultry and, thus, humans being exposed to infect or dead poultry acquire the infection. Viruses in snivel, saliva, and feces of infected birds can contaminate hands and can be brought into human body via nasal and eye membranes. After an incubation period of 1-3 days, the virus causes influenza-like symptoms characterized by high fever, chill, headache, myalgia, prostration, sore throat, and cough. Children, elderly and those debilitated by chronic diseases or immunosuppression may be susceptible to infection and express severe manifestations such as difficulties in breathing and pneumonia. Population at risk includes poultry farmers, slaughters, and handlers in contaminated areas. Avian influenza is different from human influenza in which no transmission from person to person is evident (1).

Avian influenza or bird flu was found firstly in Italy more than 100 years ago. Then it spreads through out the world. Avian influenza is classified into two types regarding its invasiveness, invasive and non-invasive type, respectively. The invasive type (H5N1) transmitted from avian to human was found firstly in Hong Kong in 1997. Hong Kong reported 18 cases and six from those cases were dead. Later in 2003, there were two cases and one from that was dead. In addition. H3N2 caused non-invasive flu in both humans and birds, 3 cases were reported. In 2003, H7N7

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caused 83 conjunctivitis cases and one was dead from pneumonia in The Netherlands. In 2004, H5N1 caused 23 cases and 16 deaths in Vietnam. In Thailand, avian influenza, H5N1, caused 12 cases and killed eight cases. In the U.S. H7N3 caused two cases of non-invasive flu (2).

All poultry are sensitive to this type of virus. Avian influenza can be found in pig and rarely occurred in water birds and seashore birds, and especially in wild birds can spread avian influenza in poultry farm and domestic poultry. Moreover, natural bird caused virus mutation, invasiveness, and the outbreak of avian influenza. The interchange of genes between different types of viruses also caused mutation. In the past, it was found that pig that infected by flu from poultry and human mutated virus and increased invasiveness whereas people did not have immunity of this virus. As a result, the outbreak of avian influenza scattered in the wide world and killed millions of people. It was believed that mutation that occurred in pig might occur in human as well (2).

Since the latest outbreak of avian influenza H5N1 has begun in the middle of December in 2003 until now covered eight countries including Cambodia, China, Indonesia, Japan, Korea, Lao, Thailand, and Vietnam. In Vietnam, bird flu caused 22 cases and 15 from those numbers were dead (fatality rate was 68 %) (3). In Canada, from March to April, 2004, reported avian flu H7 caused two conjunctivitis and one common cold in chicken farmers and a chicken slaughter. However, patients recovered after treated with Oseltamivir (4).

Direct contact of poultry or infected animals and surface contamination of secretion from infected animals such as feces, mucus, tear, and saliva may cause infection in human. People who eat uncooked meat of dead chicken and contact dead chicken are at high risk. However, the transmission of avian influenza from animals to human is still uncertain (4).

In Thailand, avian influenza transmitted from poultry to human was found in January, 2004. Patients were children located in Suphan Buri and Kanchanaburi. The number of avian influenza cases increased from January to May. In that period of time there were accumulated 12 cases and eight from those were dead from ARDS and multiple organ dysfunction syndromes (fatality rate 67%). By the region of residency, seven cases lived in central, three were in northeast and the two in north, respectively.

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By gender those cases included eight females and four males. Age average was 10 years (2-58 years). All of the cases had experienced with contacting and cooking dead chicken. [Two of them (16.7%) had a history of slaughtering, three (25 %) cooked dead chicken, seven (58.3%) contacted infected chicken, eight (56.7%) contacted dead chicken, and six (50%) kept dead chicken in house]. The results from a recent research found that the main risk factors of human are storage dead chicken in the house (OR=16.7, 95%CI=33.3-84.6), contacting with dead chicken (OR=11.0, 95%CI=2.7-45.4), and contacting with infected chicken (OR=9.2, 95%CI=2.3-37.2), respectively (5).

The main problems are that the people are not aware and concerned to the contaminated. Sometimes, the farmers discarded dead animals into water resources. Moreover, the regulation of animal transportation has been weak because some animals can be moved in and out without permission in particular when the outbreak occurs. There are some unconcerned behaviors that related to avian flu such as contacting with fighting rooters, and allowing children to play with pets. All those problems made the second attack of avian influenza seem to increase number of patients and dead animals.

The second attack was in June to October 2004, five cases leading to four deaths, including two deaths in Kamphaeng Phet, one death in Prachin Buri, one case in Phetchabun, and one death in Sukhothai. The third attack was in October to December 2005, among five cased, two death cases; two cases from Kanchanaburi with one death case, one from Nonthaburi/Bangkok Metropolis, one from Bangkok Metropolis, and one death case from Nakhonnayok. The prevalence of avian influenza caused the accumulate number from the beginning to December 31, 2005 included 22 cases and 14 deaths (6).

Suphan Buri is one of the first attack of avian influenza occurred in the late 2003. Eight millions avian were destroyed; as a result, the damage affected 33,661 farmers and the government contributed them the financial compensation 758,763,420 Baht. In the second attack in Suphan Buri between June and October, 2004, avian influenza (H5N1) scattered through many areas (see Figure 1). The Department of Livestock killed 109,896 poultry including 60,879 ducks, 21,859 chicken, 21,848 partridges, and etc (7).

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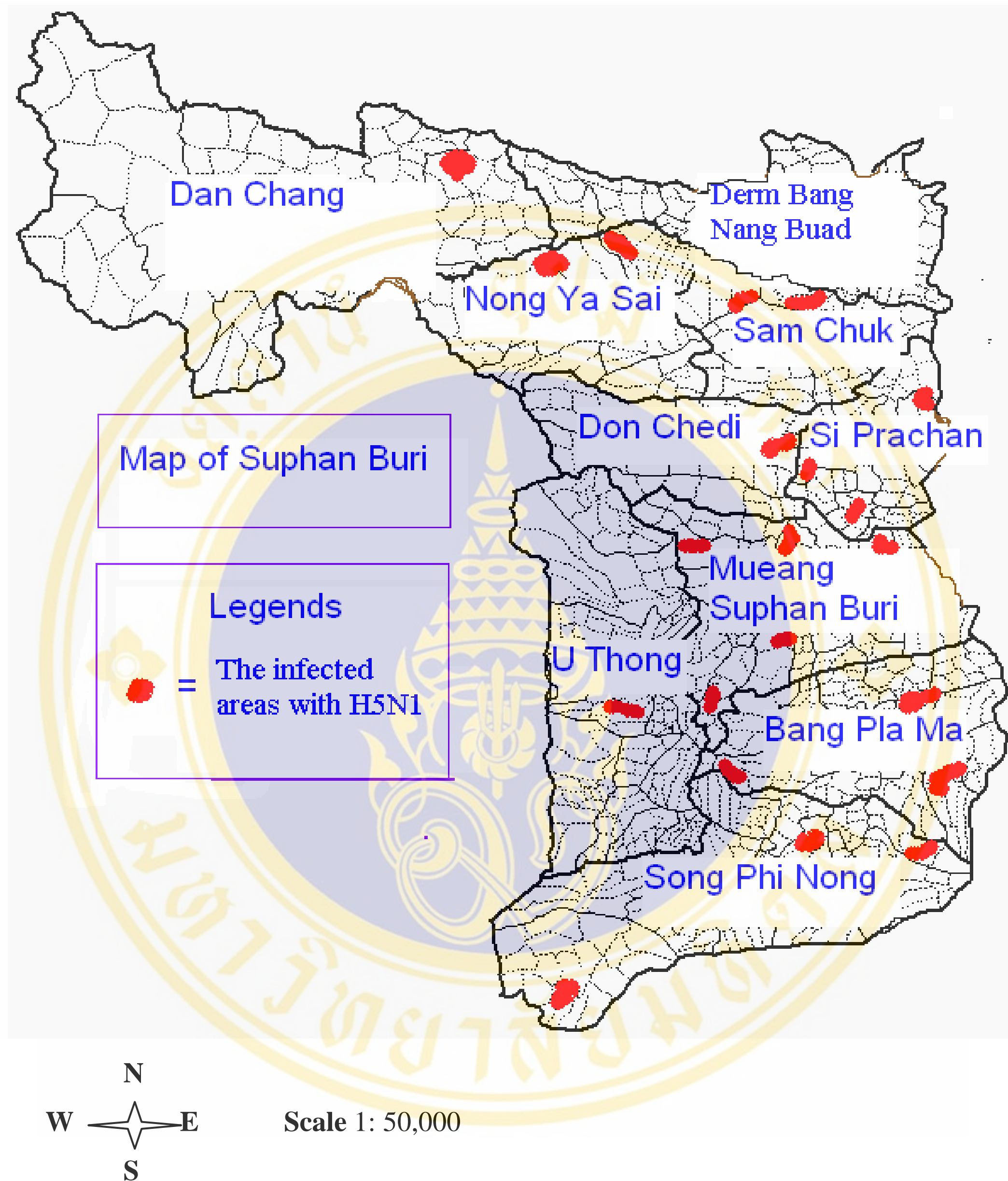

Figure 1 **the map of areas that H5N1 virus was found in Suphan Buri Province, in October 7, 2004 (7).**

The disease spread sporadically across Suphan Buri where the spots represented places of outbreak in poultry flocks or poultry farms.

WHO and relevant scientists who dealt with avian influenza congruently stated that the outbreak of avian influenza in Asia in 2004 would not be able to eliminate and the outbreak could attack over and over. Every outbreak occurs in animals, it appears

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in human at the same time (8).

The study of Arichokchai (5) concluded that the outbreak of avian influenza in human occurred definitely in the same area where the outbreak of avian influenza happened in poultry. The study illustrated that the main risk factor of avian influenza was the poultry contact. The highest risk was a direct contact with infected or dead animals as do eating dead chicken meat. Therefore, to prevent people from avian influenza, people needed to destroy poultry immediately, and not to eat meat of dead animals. The study of Prapasiri (9), compared knowledge, attitudes, and behavior between before and after intervention and found that behaviors were not different before and after intervention. The author stated that health education did not change behavior. For example, people did not take care for children who were going to contact animals, ate meat of dead animals, cut raw meat on the same chopping board at the same time they did for vegetable, and did not scrub hands after preparing meat.

According to those studies, the results showed that people did not concern to prevention and risk contraction of the disease. Therefore, it is important to have people participate and concern how to prevent and control of avian influenza effectively and sanitarily. Health providers need to develop a health education program for people to change their behaviors, to increase more awareness about the problems, and to involve with making decision and planning to solve the problem.

The method for prevention and control avian influenza (H5N1) must emphasize on people in the local outbreak of the avian influenza (H5N1) in poultry. This is to improve of individual hygiene, food safety, and proper carcass elimination, use of safeguard instruments to protect viruses, to improve environmental sanitation in and around the house, and also in livestocks or farms in the local area. Poultry infected should be promptly eliminated and not be brought to cook for food.

At present, there has no study of knowledge, attitudes and practices (KAP) neither any action research regarding avian influenza (H5N1) among people in Thailand, and no such evidence to confirm about it. To prevent and control of avian influenza, the people should initially show how much they have KAP about avian influenza (H5N1) before the implementation of an action research emphasized on community-based participation. The study was divided activities into two phases. The first phase was conducted through KAP survey about avian influenza endemicity and

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disease transmission, data administration and data analyses. Results from the first phase were to summarize the knowledge of people, attitudes and behaviors of population as a whole. These base-line information were then be used to prepare an implementation toward an empowerment program and health education in the second phase. Action research on community participation was applied and was supposed to be effectively sustainable disease prevention program for its community. In this case, community members were required to undertake the risk reduction measures, such as how to eliminate animal carcass properly, and how to use protective instrument. Beside that, behavioral changes to improve environmental sanitation of livestocks and its premises were necessary. They would be trained to know how to report whether there were suspected humans cases and animals by developed a daily- report, etc. These activities needed community participation and sustainable behaviors. Community was a focal point in developing, implementing and evaluating of the avian influenza program, so called the community-based program. It was also the center for continuous learning experiences of community members.

KAP were essential factors for the target people to change prevention and control behaviors, and were the core contents of the study program, self-efficacy and outcome expectation of Social Cognitive Learning Theory (10). From the literature review, self-efficacy is an excellent predictor of behavior. Furthermore, the self-efficacy has proven to be a consistent predictor of behavioral outcomes than has any other predictors. Thus, this study mainly focused on raising knowledge, attitudes, practices, and self-efficacy in prevention and control avian influenza among the target subjects. Besides, the outcome variables of the study were satisfaction and people's participation in the project activities of prevention and control avian influenza in the community, they were measured.

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1.2 RESEARCH PROBLEMS

The research problems in this study were as follows:

1. What were the levels of knowledge, attitudes and practices regarding to avian influenza among people, key community stakeholders, and household representatives in a study community?
2. Would the empowerment program improve key community stakeholders, and household representatives regarding their knowledge, attitudes, practices, preventive behaviors, self-efficacy, and self-esteem in relation to prevent and control of avian influenza?

1.3 RESEARCH OBJECTIVES

1.3.1 General Objective

To assess levels of knowledge, attitudes and practices (KAP) among population living in highly endemic area of avian influenza in Suphan Buri Province and to enhance an ability of their key community stakeholders using a disease prevention and control model

1.3.2 Specific Objectives

Phase I

To assess knowledge, attitudes, practices (KAP) and other base line information toward avian influenza among community members, key community stakeholders, and household representatives in Song Phi Nong district.

Phase II

1. To recruited the community stakeholders and develop an empowerment program for the phase II implementation.

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2. To implement an empowerment program in the key community stakeholders.

3. To measure the changes of KAP in avian influenza, self-efficacy, necessary perception, self-esteem, satisfaction and people's participation in the activities of prevention and control avian influenza among key community stakeholders and household representatives.

1.4 SIGNIFICANCE OF THE STUDY

1. Knowledge, attitudes, and practices (KAP) levels toward the prevention and control of avian influenza among people would be based line information and be utilized by provincial authorities to plan for health education to improve health behaviors, and to assign for measurement of prevention and control of the disease in the study community.

2. The community-based empowerment program (CBEP) in relation to prevention and control of avian influenza was appropriate to use a demonstrative model about participation and involvement of the community stakeholders and family leaders. The study results could also be replicated to other communities where there is a high incidence of avian influenza. Knowledge, attitude, and practice information, self-efficacy, necessity of prevention and control of the disease, and learning experiences gained from the study would be helpful to the Department of Disease Control, Ministry of Public Health, Thailand in developing avian influenza prevention and control program. Furthermore, the study model would affect prevention program in promoting behaviors of avian influenza as well. In addition, this study could assist health personnel on the essential socio-cultural factors in developing some related health programs at the community level.

1.5 STUDY VARIABLES

Phase 1: KAP Survey Regarding Prevention and Control of avian influenza Among People in Song Phi Nong District, Suphan Buri Province

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Demographic data included personal characteristics: sex, age, educational level, religion, marital status, family income, exposure to information about avian influenza and etc. Key outcomes of interest included knowledge, attitudes, and practices on the prevention and control of avian influenza.

Phase 2: Action Research Process and Intervention

1) **Independent variable** was the community-based empowerment program (CBEP) for enhancing an efficacy of the key community stakeholders and household representatives regarding avian influenza prevention and control. The CBEP was a continuous educational process to empower the stakeholders through active participation in prevention and control of avian influenza. The CBEP main strategy was "ongoing training activities" through active participation among community stakeholders. The CBEP strategy comprised of participatory learning and action, small group discussion, brainstorming, and continuous dialogue.

2) Dependent variables are:

2.1 Knowledge, attitudes, and practices (KAP) about the avian influenza and protective health behaviors.

2.2 Perceived self-efficacy in prevention and control of avian influenza

2.3 Perceived necessary practices in the activities of prevention and control of avian influenza

2.4 Perceived self-esteem of key communities and household representatives.

2.5 People's satisfaction to the project activities and actions of the key communities in prevention and control of avian influenza

2.6 Community participation in the activities of prevention and control of avian influenza in the study village.

2.7 Advantage and benefit of the project activities in prevention and control of avian influenza affected the study village.

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1.6 DEFINITIONS OF TERMS

Terms used in this study are defined as follows.

Knowledge on avian influenza refers to the understanding of the concepts of avian influenza in relation to: causative agent, mode of transmission, risk group, prevention of transmission and control measures against avian influenza. The data about knowledge will be collected by a structured questionnaire.

Attitudes toward avian influenza refers to the degree of positive or negative agreements, beliefs and intention to act toward avian influenza, and avian influenza prevention will be measured by three - point self rating scales (11).

Practices toward avian influenza refer to preventive behaviors practices on avian influenza. Structured questionnaire consists of two parts, 1) practices of using preventive and control measures such as wearing mask, gloves, and goggles, and 2) personal protective practices related to hand washing with soap.

A community-based empowerment program (CBEP) was a continuous educational process to empower the key community stakeholders through active participation in the prevention and control of avian influenza. Development of CBEP was constructed by using the baseline data and information from the literature review together with information from ongoing evaluation of the program implementation. The CBEP main strategy was so called "on going training activities" through active participation among community stakeholders. The CBEP methods comprised of participatory learning and action, small group discussion, brainstorming, and continuous dialogue. The stakeholders participated in all steps: started from problem identification, clarification of the problem, identification of possible solutions, project development, project implementation, and project evaluation.

A Community-based approach or community participation approach was a process by which the key communities stakeholders were enable to become actively involve in defining their avian influenza problems. The participation of key communities stakeholders were determined by the involvement in planning,

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implementation and evaluation of the program activities. The key community stakeholders of this study were divided into two groups as follows:

1. **Key community stakeholders** were individuals or an existing group from the affected community members namely village health volunteers, village headman, village headman assistants, committee members of village, members of housewife group, members of village security group, members of council Tambon Administrative Organization (TAO), and Technology Transfer Leadership of Thung-Khok sub-district.

2. **Facilitative stakeholders** were people who had authorities, comprising health workers from Thung Khok sub-district health center including three persons. Ban Long Tong Health Centre had one person, and Song Phi Nong district health office two persons.

Self-efficacy in prevention and control of avian influenza refers to level of self confidence in their own abilities of key communities and household representatives in performing avian influenza prevention and control, assessed by a tool developed based on the Bandura's concept in term of its rating scales.

Self-esteem referred to the feeling of key communities and household representatives who assessed themselves as they were significant and accepted by the society and also got ability to do something successfully. It was assessed by the Rosenberg Self-Esteem Scale, which included ten items during an in-depth interview.

Factors contributing to the effectiveness of avian influenza prevention and control referred to personal factors (sex, age, status in the community, or having children and elderly, etc.), behavioral factors (KAP of avian influenza, and self-efficacy in the prevention and control of avian influenza) that were expected to affect the effectiveness of avian influenza prevention and control.

People's satisfaction referred to levels of satisfaction of household representatives within the project activities and community action in the prevention and control of avian influenza in the intervention village.

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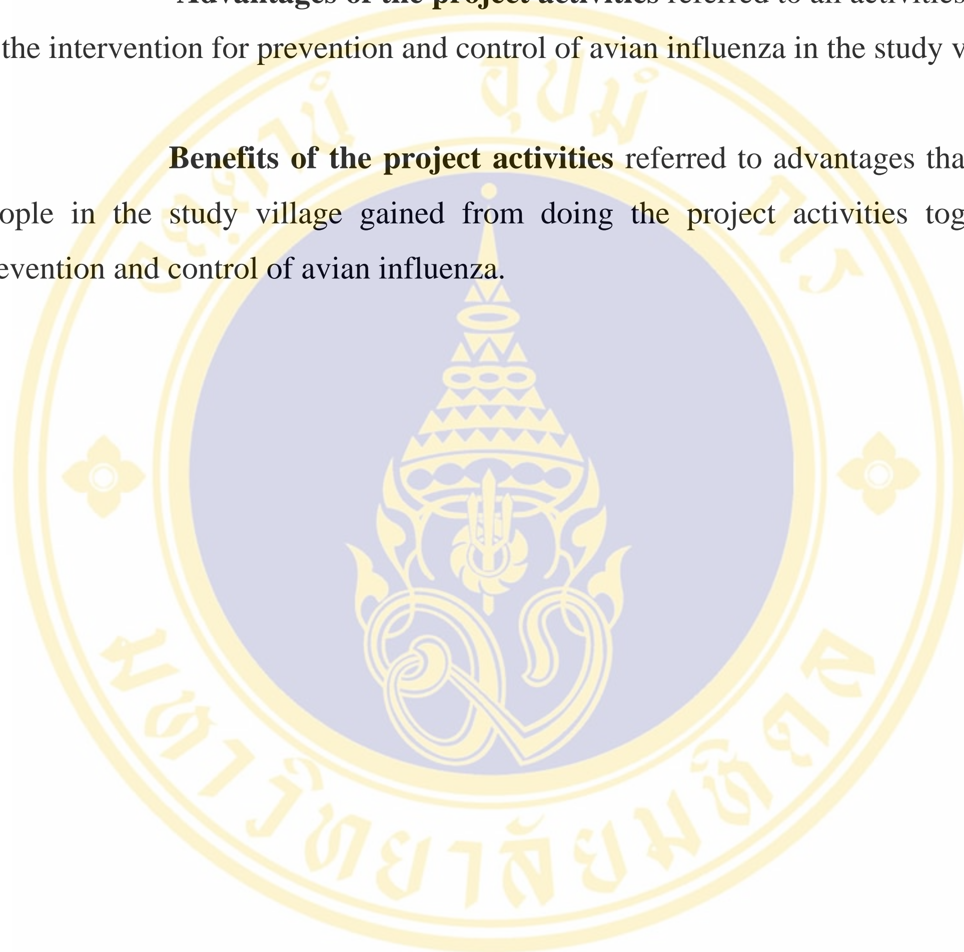
People's participation referred to the number of household representatives who participated in this study and performed activities of prevention and control of avian influenza in the intervention village.

Advantages of the project activities referred to all activities occurred in the intervention for prevention and control of avian influenza in the study village.

Benefits of the project activities referred to advantages that most of people in the study village gained from doing the project activities together for prevention and control of avian influenza.



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CHAPTER II

LITERATURE REVIEW

This chapter presents an integrative review of the theoretical and empirical literature describing the concepts in the studying model and the interrelationship among them. The reviews of related literatures were as following.

2.1 Avian influenza
2.2 Concept about knowledge, attitudes and practices
2.3 Community participation and development
2.4 Empowerment Education Technique
2.5 Participatory Learning and Action Technique
2.6 Social Cognitive Theory
2.7 Relevant Researches
2.8 Constructing of the Study Conceptual Framework

2.1 AVIAN INFLUENZA

2.1.1 TYPES, SUBTYPES AND STRAINS (12)

There are three types of influenza viruses: A, B, and C.

Influenza Type A

Influenza type A viruses can infect people, birds, pigs, horses, seals, whales, and other animals, but wild birds are the natural hosts for these viruses. Influenza type A viruses are divided into subtypes based on two proteins on the surface of the virus. These proteins are called hemagglutinin (HA) and neuraminidase (NA). There are 15 different HA subtypes and 9 different NA subtypes. Many different combinations of HA and NA proteins are possible. Only some influenza A subtypes (i.e., H1N1, H1N2,

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and H3N2) are currently in general circulation among people. Other subtypes are found most commonly in other animal species. For example, H7N7 and H3N8 viruses cause illness in horses.

Subtypes of influenza A virus are named according to their HA and NA surface proteins. For example, an "H7N2 virus" designates influenza A subtype that has an HA 7 protein and an NA 2 protein. Similarly an "H5N1" virus has an HA 5 protein and an NA 1 protein.

Influenza Type B

Influenza B viruses are normally found only in humans. Unlike influenza A viruses, these viruses are not classified according to subtype. Although influenza type B viruses can cause human epidemics, they have not caused pandemics.

Influenza Type C

Influenza type C viruses cause mild illness in humans and do not cause epidemics or pandemics. These viruses are not classified according to subtype.

Strains

Influenza B viruses and subtypes of influenza A virus are further characterized into strains. There are many different strains of influenza B viruses and of influenza A subtypes. New strains of influenza viruses appear and replace older strains. This process occurs through a type of change is called "drift." When a new strain of human influenza virus emerges, antibody protection that may have developed after infection or vaccination with an older strain may not provide protection against the new strain. Thus, the influenza vaccine is updated on a yearly basis to keep up with the changes in influenza viruses.

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2.1.1.1 Human Influenza Viruses versus Avian Influenza Viruses

Humans can be infected with influenza types A, B, and C. However, the only subtypes of influenza A virus that normally infect people are influenza A subtypes H1N1, H1N2, and H3N2. Between 1957 and 1968, H2N2 viruses also circulated among people, but currently do not.

Only influenza A viruses infect birds. Wild birds are the natural host for all subtypes of influenza A virus. Typically wild birds do not get sick when they are infected with influenza virus. However, domestic poultry, such as turkeys and chickens, can get very sick and die from avian influenza, and some avian viruses also can cause serious disease and death in wild birds.

2.1.1.2 Low Pathogenic versus Highly Pathogenic Avian Influenza Viruses

H5 and H7 subtype of avian influenza A viruses can be further classified as either highly pathogenic avian influenza (HPAI) or low pathogenic avian influenza (LPAI). This distinction is made on the basis of genetic features of the virus. HPAI is usually associated with high mortality in poultry. It is not certain how the distinction between "low pathogenic" and "highly pathogenic" is related to the risk of disease in people. HPAI viruses can kill 90 to 100% of infected chickens, whereas LPAI viruses cause less severe or no illness if they infect chickens. Because LPAI viruses can evolve into HPAI viruses, animal health officials closely monitor outbreaks of H5 and 7 LPAI.

2.1.1.3 How Influenza Viruses Change: Drift and Shift

Influenza viruses can change in two different ways. One type is called "antigenic drift," which occurs through small changes in the virus that happen continually over time. Antigenic drift produces new virus strains that may not be recognized by antibodies to earlier influenza strains. This process works as follows: a person infected with a particular flu virus strain develops antibody against that virus. As newer virus strains appear, the antibodies against the older strains no longer recognize the "newer" virus, and infection with a new strain can occur. This is one of

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the main reasons why people can get the flu more than one time. In most years, one or two of the three virus strains in the influenza vaccine are updated to keep up with the changes in the circulating flu viruses. For this reason, people who want to be immunized against influenza need to receive a flu vaccination every year.

The other type of change is called “antigenic shift.” Antigenic shift is an abrupt, major change in the influenza A viruses, resulting in a new influenza virus that can infect humans and has a hemagglutinin protein or hemagglutinin and neuraminidase protein combination that has not been seen in humans for many years. Antigenic shift results in a new influenza A subtype. If a new subtype of influenza A virus is introduced into the human population, if most people have little or no protection against the new virus, and if the virus can spread easily from person to person, a pandemic (worldwide spread) may occur.

Influenza viruses are changing by antigenic drift all the time, but antigenic shift happens only occasionally. Influenza type A viruses undergo both kinds of changes; influenza type B viruses change only by the more gradual process of antigenic drift.

2.1.2 AVIAN INFLUENZA VURUSES (13)

Influenza viruses that infect birds are called “avian influenza viruses.” Only influenza A viruses infect birds. All known subtypes of influenza A virus can infect birds. However. There are substantial genetic differences between the subtypes that typically infect both people and birds. Within subtypes of avian influenza viruses there also are different strains.

Avian influenza H5 and H7 viruses can be distinguished as “low pathogenic” and “high pathogenic” forms on the basis of genetic features of the virus and the severity of the illness they cause in poultry; influenza H9 virus has been identified only in a “low pathogenicity” form. Each of these three avian influenza viruses (H5, H7, and H9) can theoretically be partnered with any one of nine neuraminidase surface proteins; thus, there are potentially nine different forms of each subtype (e.g., H5N1, H5N2, H5N3…H5N9).

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Below is summary information about these three prominent subtypes of avian influenza virus:

Influenza A H5

- Potentially nine different subtypes
- Can be highly pathogenic or low pathogenic
- H5 infections have been documented among humans, sometimes causing severe illness and death

Influenza A H7

- Potentially nine different subtypes
- Can be highly pathogenic or low pathogenic
- H7 infection in humans is rare, but can occur among persons who have close contact with infected bird; symptoms may include conjunctivitis and/or upper respiratory symptoms

Influenza A H9

- Potentially nine different subtypes
- Documented only in low pathogenic form
- Three H9 infections in humans have been confirmed.

Transmission of Influenza A Viruses between Animals and People

Influenza A viruses are found in many different animals, including ducks, chickens, pigs, whales, horses, and seals. However, certain subtypes of influenza A virus are specific to certain species, except for birds which are hosts to all subtypes of influenza A. Subtypes that have caused widespread illness in people either in the past or the current period are H3N2, H2N2, H1N1, and H1N2. H1N1 and H3N2 subtypes have caused outbreaks in pigs and H7N7 and H3N8 viruses have caused outbreaks in horses.

Influenza A viruses normally seen in one species sometimes can cross over and cause illness in another species. For example, up until 1998, only H1N1 viruses circulated widely in the U.S. pig population. However, in 1998, H3N2 viruses from humans were introduced into the pig population and caused widespread disease among pigs.

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Avian influenza viruses may be transmitted to humans in two main ways:

- Directly from birds or from avian virus-contaminated environments to people.
- Through an intermediate host, such as a pig.

Influenza viruses have eight separate gene segments. The segmented genome allows viruses from different species to mix and create a new influenza A virus if viruses from two different species infect the same person or animal. For example, if a pig were infected with a human influenza virus and an avian influenza virus at the same time, the viruses could reassort and produce a new virus that had most of the genes from the human virus, but a hemagglutinin and/or neuraminidase from the avian virus. The resulting new virus might then be able to infect humans and spread from person to person, but it would have surface proteins (hemagglutinin and/or neuraminidase) not previously seen in influenza viruses that infect humans.

This type of major change in the influenza A viruses is known as antigenic shift. Antigenic shift results when a new influenza A subtype to which most people have little or no immune protection infects humans. If this new virus causes illness in people and can be transmitted easily from person to person, an influenza pandemic can occur.

It also is possible that the process of reassortment could occur in a human. For example, a person could be infected with avian influenza and a human strain of influenza at the same time. These viruses could reassort to create a new virus that had a hemagglutinin from the avian virus and other genes from the human virus. Theoretically, influenza A viruses with a hemagglutinin against which humans have little or no immunity that have reassorted with a human influenza virus are more likely to result in sustained human-to-human transmission and pandemic influenza. Thus, careful evaluation of influenza viruses recovered from humans who are infected with avian influenza is very important to identify reassortment if it occurs.

2.1.3 INFLUENZA PANDEMICS (14)

An influenza pandemic is a global outbreak of influenza and occurs when a new influenza A virus emerges among people, spreads, and causes disease worldwide.

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Past influenza pandemics have led to high levels of illness, death, social disruption and economic loss.

There are three pandemics in the 20th century. All of them spread worldwide within 1 year of being detected. They are:

- **1918 – 19, “Spanish flu,”** [A (H1N1], caused the highest number of known flu deaths: more than 500,000 people died in the United States, and 20 million to 50 million people may have died worldwide. Many people died within the first few days after infection and others died of complications soon after. Nearly half of those who died were young, healthy adults.
- **1957 – 58 “Asian flu,”** [A (H2N2], caused about 70,000 deaths in the United States. First identified in China in late February 1957, the Asian flu spread to the United States by June 1957.
- **1968 – 69 “Hong Kong flu,”** [A (H3N2)], caused approximately 34,000 deaths in the United States. This virus was first detected in Hong Kong in early 1968 and spread to the United States later that year. Type A (H3N2) viruses still circulate today.

Both the 1957 –58 and 1968 – 69 pandemic viruses were a result of the reassortment of a human virus with an avian influenza virus. The origin of the 1918 pandemic virus is not clear.

Instances of Avian Influenza Infections in Humans

Confirmed instances of avian influenza viruses infecting humans since 1997 included:

- H5N1, Hong Kong, 1997: Avian influenza A (H5N1) infections occurred in both poultry and humans. This was the first time an avian influenza virus had ever been found to transmit directly from birds to humans. During this outbreak, 18 people were hospitalized and six of them died. To control the outbreak, authorities killed about 1.5 million chickens to remove the source of the virus. Scientists determined that the virus spread primarily from birds to humans, though rare person-to-person infection was noted.
- H9N2, China and Hong Kong, 1999: Avian influenza A H9N2

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illness was confirmed in two children. Both patients recovered, and no additional cases were confirmed. The evidence suggested that poultry was the source of infection and the main mode of transmission was from bird to human. However, the possibility of person-to-person transmission could not be ruled out. Several additional human H9N2 infections were reported from mainland China in 1998-99.

- H7N2, Virginia, 2002: Following an outbreak of H7N2 among poultry in the Shenandoah Valley poultry production area, one person was found to have serologic evidence of infection with H7N2.

- H5N1, China and Hong Kong, 2003: Two cases of avian influenza A (H5N1) infection occurred among members of a Hong Kong family that had traveled to China. One person recovered, the other died. How or where these two family members were infected was not determined. Another family member died of a respiratory illness in China, but no testing was done.

- H7N7, Netherlands, 2003: The Netherlands reported outbreaks of influenza A (H7N7) in poultry on several farms. Later, infections were reported among pigs and humans. In total, 98 people were confirmed to have H7N7 influenza virus infection associated with this poultry outbreak. These cases occurred mostly among poultry workers. H7N7-associated illness included 78 cases of conjunctivitis (eye infections) only; 5 cases of conjunctivitis and influenza-like illnesses with cough, fever, and muscle aches; 2 cases of influenza-like illness only; and 4 cases that were classified as "other." There was one death among the 89 total cases. The death occurred in a veterinarian who visited one of the affected farms and developed acute respiratory distress syndrome and complications related to H7N7 infection. The majority of these cases occurred as a result of direct contact with infected poultry; however, Dutch authorities reported three possible instances of transmission from poultry workers to family members. Since that time, no other instance of H7N7 infection among humans has been reported.

- H9N2, Hong Kong, 2003: H9N2 infection was confirmed in a child in Hong Kong. The child was hospitalized but recovered.

- H7N2, New York, 2003: In November 2003, a patient with serious underlying medical conditions was admitted to a hospital in New York with respiratory symptoms. One of the initial laboratory tests identified influenza A virus

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that was thought to be H1N1. The patient recovered and went home after a few weeks. Subsequent confirmatory tests conducted in March 2004 showed that the patient had been infected with an H7N2 avian influenza virus. An investigation to determine the source of infection is ongoing.

- H5N1, Thailand and Vietnam, 2004: In January 2003, outbreaks of highly pathogenic influenza A (H5N1) in Asia were first reported by the World Health Organization. The outbreaks are ongoing among bird populations in a number of Asian countries and human cases were still being reported in Thailand and Vietnam in March 2004.
- H7N3 in Canada, 2004: In February 2004, human infections of H7N3 among poultry workers were associated with an H7N3 outbreak among poultry. The H7N3-associated illnesses consisted of eye infections.

2.1.4 SITUATION OF AVIAN INFLUENZA A (H5N1) IN ASIA (15)

Outbreaks of highly pathogenic influenza A (H5N1) occurred among poultry in eight countries in Asia (Cambodia, China, Indonesia, Japan, Laos, South Korea, Thailand and Vietnam) during late 2003 and early 2004. At that time, more than 100 million birds either died from the disease or were culled. From December 30, 2003, to March 17, 2004, there were 12 human cases of confirmed H5N1 influenza in Thailand and 23 in Vietnam, including 23 deaths. No conclusive evidence of sustained human-to-human transmission was found.

2.1.4.1 Recent Developments

Beginning in late June 2004, new lethal outbreaks of H5N1 among poultry were reported by several countries in Asia: Cambodia, China, Indonesia, Malaysia, Thailand, and Vietnam.

In August, the Vietnamese Ministry of Health officially reported 3 human deaths from confirmed avian influenza H5 infection. These were the first reported human cases since the second wave of H5N1 infection among poultry. On

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September 7, WHO received informal reports of an additional human death in Vietnam. In September, three new human cases were reported in Thailand.

2.1.4.2 Avian Influenza (H5N1) – Situation in Asia: Altered Role of Domestic Ducks 29 October 2004 (16)

Countries experiencing outbreaks of H5N1 in poultry need to be aware that domestic ducks may have acquired an important role in the transmission of highly pathogenic H5N1 to other poultry and, possibly, to humans as well. A new laboratory study of domestic ducks infected with several 2004 H5N1 viruses shows that, when compared with infections caused by viruses from 2003, domestic ducks are shedding more virus for longer periods. The majority are doing so without showing symptoms of illness.

Findings from this study also show that, compared to highly pathogenic avian influenza viruses from previous outbreaks, the recent H5N1 viruses survive several days longer in the environment. The study found that the quantities of virus excreted by healthy-looking ducks approach those excreted by diseased – and visibly very ill – chickens. This suggests that domestic ducks might now be acting as a "silent" reservoir for the H5N1 virus, which is highly pathogenic for chickens.

To date, no evidence has linked human H5N1 cases to exposure to a symptomatic domestic ducks. However, the laboratory findings come at a time when some human cases could not be traced to contact with diseased or dead poultry. In terms of preventing further human cases, it is of public health concern that ducks may be infected and shed virus for long periods, yet issue no "warning signal" in the form of visible signs and symptoms that alert people to take precautions. The concern is greatest in rural areas of affected countries, where free-ranging ducks and chickens often mingle, frequently sharing the same water supplies.

The new findings expand on recent evidence, based on characterization of H5N1 viruses from southern China that domestic ducks have played a central role in generating and maintaining H5N1, in its highly pathogenic form, in parts of Asia (17).

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Findings pointing to an altered role for domestic ducks join other recent evidence that the H5N1 virus circulating in parts of Asia has increased its pathogenicity in chickens and mice (a laboratory model for mammals), and has expanded its host range to include mammals, such as felines, not previously considered susceptible to infection.

2.1.5 SITUATION OF AVIAN INFLUENZA A (H5N1) IN THAILAND (18)

2.1.5.1 Two New Cases Confirmed

In 2004, the Ministry of Public Health in Thailand has confirmed two new cases of H5N1 avian influenza in humans. The cases are a 26-year-old woman, who died on 20 September, 2004, and her 32-year-old sister, who remains hospitalized in stable condition.

These new cases bring the total in Thailand confirmed since early September to three. Altogether, Thailand has reported 15 cases, of which 10 were fatal, since the first human cases were detected in January, 2004.

2.1.5.2 Investigation of Possible Human-to-Human Transmission in a Family Cluster

The most recent cases are part of a family cluster of four cases under investigation to determine whether human-to-human transmission may have occurred. Immediate investigation of any possible human-to-human transmission is always needed to determine whether transmission has been efficient and sustained. Such a situation would be cause for alarm, as it might signal the start of an influenza pandemic. Inefficient, limited human-to-human transmission may occur on rare occasions and is in line with what is known, from epidemiological and laboratory investigations, about the possible behavior of the H5N1 virus.

The initial case in the family cluster was an 11-year-old girl who died of pneumonia on 8 September. Thai authorities regard her as a probable case of H5N1;

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laboratory confirmation is not possible as no specimens from this patient are available for testing. The girl, who lived in the northern province of Kamphaeng Phet, resided with her 32-year-old aunt, whose infection has been confirmed. Both patients are known to have had contact with dead chickens.

The girl's 26-year-old mother, whose infection is also now confirmed, resided in the Bangkok area, but provided bedside care for her daughter while hospitalized, up to the time of the child's death. The mother fell ill upon her return to Bangkok, where she died on September 20, 2004.

Thai officials have concluded that the mother could have acquired the infection either from some environmental source or while caring for her daughter, and that this represents a probable case of human-to-human transmission.

Surveillance for additional cases, among health workers and in the wider community, has been greatly intensified in the province, and hospitals nationwide have been placed on heightened alert for further cases.

While the investigation of this family cluster provides evidence that human-to-human transmission may have occurred, evidence to date indicates that transmission of the virus among humans has been limited to family members and that no wider transmission in the community has occurred. Continued vigilance is needed to determine whether the epidemiological situation in humans remains stable.

Clinical samples taken from cases in the family cluster were immediately shared with a laboratory in the WHO Global Influenza Surveillance Network. Virus isolated from these samples will undergo genetic and antigenic analysis to determine whether the virus has evolved and, more specifically, whether it has acquired genes that allow improved transmissibility among humans.

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2.1.5.3 Avian Influenza Surveillance Report in Human in Thailand

The Ministry of Public Health in Thailand has today confirmed an additional fatal case of human infection with H5N1 avian influenza. The patient was a 14-year-old girl from Sukhothai Province. She developed symptoms on 8 October and died on October 19, 2004. Chickens at her household died suddenly in late September. The girl's death brings the total in Thailand to 17 cases, of which 12 have been fatal (19).

2.1.5.4 Avian Influenza in Human Situation 2005 in Thailand (20)

Since January 1, 2005 to November 11, 2005, the Bureau of Epidemiology has received reports of influenza or pneumonia cases in Avian Influenza Surveillance Network from the Provincial Health Offices and Disease Prevention and Control Regional Offices. The investigation and analysis were summarized as follows:

1) **Cumulative number of patients under surveillance** are 1,914 cases; 74 provinces. Today reports are 55 cases; Fourteen cases from Suphanburi, four from Nonthaburi, three each from Lopburi, Ratchaburi, and Kanchanaburi, two each from Pathumthani, Ayutthaya, Rayong, Chaingmai, Phitsanulok, Kamphaengphet and Songkla, and one each from Bangkok, Singburi, Samut Sakhon, Samut Prakan, Chachaengsao, Chanthaburi, Sukhothai, Nakhon Sawan, Phichit, Loei, Nong Khai, Maha Sarakham, Nakhon Ratchasima and Trang.

2) **Confirmed human cases of avian influenza** one new case, totally four cases;

   a. two cases from Kanchanaburi with one death case
   b. one from Nonthaburi/Bangkok Metropolis
   c. A new case from Bangkok was a boy, one a half year old, live in the

Bangkok suburb area. Three backyard chickens in his neighborhood were found dead on 30 of October, 2005 and were buried by villager. On 1st of November, 2005 the boy developed fever, cough and running nose. He was treated at a private hospital as outpatient. On 5th of November the fever relapsed and the boy was referred to Siriraj Medical School. Chest x-ray revealed minimal peripheral infiltration. Today, specimen of nasopharyngeal wash was confirmed positive for H5 by Real time PCR performed

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by the Virology unit at the hospital and also by the Department of Medical Science of the Ministry. The boy has no fever and is in good condition at present. Among the family members, the grandmother developed mild fever on 5th of November. She was admitted to a Ministry hospital on 10th of November and was diagnose of having right Upper lobe pneumonia. Laboratory investigation for H5 is on going. Her condition is stable. The Department of Disease Control with the Bangkok Metropolitan Authority will put all family members and member of four of the neighboring families on daily monitoring for at least the next 10 days.

3) **There is no suspect cases reported**.

Conclusion: In 2005, there are four confirmed human cases of avian influenza, with one death. No patient from man-to-man transmission reported.

2.1.5.5 Avian Influenza International Situation, www.who.int (20)

WHO report in brief: Since 26 December 2004, to 9 November 2005, there had been 125 H5N1 confirmed reported cases, with 64 deaths in four countries; Vietnam = 92, with 42 deaths; Four confirmed dead cases from Cambodia; 20 cases with 13 deaths in Thailand; and nine cases with five deaths from Indonesia. (Table1)

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Table 1: Details of Confirmed H5N1 Cases from WHO Reports.

Duration	Indonesia		Cambodia		Thailand		Vietnam		Total	
	Case	Dead	Case	Dead	Case	Dead	Case	Dead	Case	Dead
26 December - 10 March 2004	0	0	0	0	12	8	23	16	35	24
19 July - 8 October 2004	0	0	0	0	5	4	4	4	9	8
16 December 2004 - 9 November 2005	9	5	4	4	3	1	65	22	80	32
Summary	9	5	4	4	20	13	92	42	125	64

2.1.5.6 Surveillance of Avian Influenza in Human in Thailand (21)

Definition of Avian Influenza (Bird flu)

The case definition of avian influenza has been changed several times, because it is a new disease. From experiences in handling the disease, the new definition would be categorized into three levels:

Suspected Cases, which include patients with the following symptoms

• Fever (body temperature of 38 degrees Celsius or higher); in addition to

• One of the following symptoms – muscle ache, cough, abnormal breathing (unusual breathing difficulty), or suspected of pneumonia by physician, or influenza; in addition to

• History of direct contact with infected / dead birds in the past seven days or occurrence of unusual death of birds in the community within the past 14 days; or contact with a pneumonia patient or another patient suspected of Avian Influenza.

Probable Cases, which include the above mentioned symptoms of suspected cases, in addition to:

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• Preliminary test shows infection of influenza group A, but cannot yet be confirmed whether it is influenza from humans or birds.

• Respiratory failure

• Death

Confirmed Cases, which include suspected patients with final PCR (Polymerase chain reaction) test or virus isolation showing H5 strain of influenza group A, which is a bird strain.

Note: Diagnosis of suspected and probable cases can be changed if confirmation tests show that the patient's infection was caused by other factors.

Sending specimens to laboratories

Includes

1) Nasopharyngeal swab placed in viral transport media with ice pack in order to maintain the temperature at 2-4 degrees Celsius and sent to the Medical Sciences Department laboratory within 48 hours.

2) Clotted blood 5millilitres (cc), taken twice, the first time when the patient was identified and the second time at least after 14 days of the first collection.

Disease Surveillance and Investigation

1. Full scheme surveillance of patients with pneumonia and influenza. Investigate history of all patients admitted to the hospital on suspicion of pneumonia and influenza, in detail, including history of

• Living in a house or village where birds have been reported ill or died in the past two weeks

• Direct contact with birds which fell ill or died in the past one week

• Contact with other pneumonia patients in the past week

Patients with history that fits the above mentioned criteria must be immediately reported and investigated by local teams in the community without having to wait for laboratory test confirmation. The patients should be taken care of according to the Public Health Ministry's clinical guidelines.

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2. Specimen samples of all patients who have died of pneumonia should be sent for Avian Influenza test.

3. Disease investigation should be carried out on identification of a suspected patient. Disease control measures, which include the following, should also be practiced in the communities:

• Find out from both the public and private sectors, on the extent of death of birds

• See if there are any other patients suspected of Avian Influenza who have not received treatment.

• Follow up on all members of the family residing with patients under treatment, for at least 7 days from the last day of stay with the patient. Immediate investigation and diagnosis is required if the person develops fever.

Note: Report to the Regional Disease Control Centre, Disease Control Department, for further investigation to find out if there is a human to human transmission of Avian Influenza or not.

2.1.6 RECOMMENDATIONS FOR THE PUBLIC FOR PROTECTION AGAINST AVIAN INFLUENZA IN THAILAND (22)

Regarding the outbreak of avian influenza, Ministry of Public Health has currently implemented the disease surveillance, particularly, infections of the respiratory tract. The Ministry has also collaborated with the Department of Livestock to contain the outbreak in infected or contaminated areas, including prevent selling infected or dead chickens in markets.

At the moment, general people have low risk of getting infection with avian influenza virus. Consumption of fully cooked chickens and eggs will not cause the infection. For safety precautions, the Ministry has issued the following information about avian influenza and recommendations regarding protective measures.

Avian influenza or bird flu is an infectious disease of birds. Normally, the disease is not easily transmitted from infected birds to humans. However, direct or close contact with infected poultry may cause infection. The infection of humans with an avian influenza virus was first documented in 1997 when an outbreak occurred in

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poultry population in Hong Kong. Avian influenza is caused by some subtypes of influenza virus normally infect or circulate in bird populations. Certain species of bird are the natural reservoir of avian influenza viruses. The virus may be spread to domestic poultry and, thus, humans being exposed to infect or dead poultry acquire the infection. The virus being in snivel, saliva, and feces of infected birds can contaminate hands and can be brought into our body via nasal and eye membranes. After an incubation period of 1-3 days, the virus causes influenza-like symptoms characterized by high fever, chill, headache, myalgia, prostration, sore throat, and cough. Children, elderly and those debilitated by chronic diseases or immunosuppression may be susceptible to infection and express severe manifestations such as difficulties in breathing and pneumonia. Population at risk includes poultry farmers, slaughters, and handlers in contaminated areas. Avian influenza is different from human influenza in which no transmission from person to person is evident.

2.1.6.1 Recommendations on Protective Measures

Consumers

1. In order to prevent respiratory infection and GI tract infection, only fully cooked meat and eggs are recommended. Pathogens, e.g. virus, bacteria, intestinal worms, are destroyed by heat.
2. Chicken and eggs, currently on sale in the markets, are edible. Fully cooked chicken and eggs are safe. Avoid semi-cooked or under-cooked dishes.
3. Select only fully cooked eggs, especially during the outbreak in poultry population.

Food Handlers-Housewives-Chefs

Food handlers, housewives and chefs play an important role in the prevention of food-borne diseases.

1. Purchase only chicken and chicken products from a guaranteed or standardized shop. Select fresh chicken having no signs of illness or infection, e.g.

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dark color, hemorrhage etc. Select fresh eggs, without feces staining on the shell. Clean the shell before cooking.

2. Frequently wash the hands, especially after handling meat, internal organs, eggs staining with feces. Avoid touching nose, eyes, and mouth with contaminated hands.

3. Separate a board used for chopping chicken from the one used for cutting cooked food, vegetables, or fruits.

Slaughters

1. Do not purchase sick chicken or those having cyanosis, ruffled feathers, snivel, diarrhea etc. or dead chicken to be slaughtered for sale.

2. Do not contain poultry, e.g. chicken, ducks, geese etc. waiting for slaughter in close proximity in order to avoid a condition favorable for the mixing of genetic materials which may result in the emergence of a highly pathogenic subtype.

3. Continuously clean cages and involved equipment with detergent and water, and let them dried in sunlight. May soak with antiseptic1-2 times a month.

4. If hemorrhages, exudation with water or blood, white spots of dead cells in internal contents, abnormal color etc. appear in slaughtered birds, report any relevant information to livestock officials at once.

5. Carefully wash slaughter area with detergent and water after work. Spray disinfectant 1-2 times a month is recommended.

6. Protect you properly by wearing gloves, glasses, a mask, an apron, a pair of boots, and frequently wash the hands.

7. After work, take a bath or a shower, and change new clothing. Disinfect or clean the dirty clothes, apron, mask, gloves, glasses, and let them dried in sunlight before re-used.

Transporters

Those who deal with the movement of poultry should protect themselves from acquiring infection and from transmitting the disease from farm to farm. They should

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strictly follow the recommendations provided by the Department of Livestock, in particularly,

1. Stop purchasing poultry from a farm having high incidence of dead birds.
2. Clean cages and vehicles thoroughly with detergent and water every day Disinfectant, such as the mixture of water and chlorine powder, should be re-applied to cages after washing with detergent and water.
3. Take appropriate personal protection by using a mask, wearing gloves and boots. Wash the hands frequently with soap and water.
4. Thoroughly clean the body with soap and water, and change new clothing after work. Dirty clothing and protective equipment should be cleaned or disinfected and dried in sunlight before re-used.

Poultry farmers

Poultry farmers, animal raisers, and workers involved in infected farm are persons at high risk for infection. The recommendations from Department of Livestock should be strict as follows.

1. Poultry farmers must prevent other animals, including any birds and rodents, from entering chicken coop and housing. These animals may carry the virus to domesticated poultry. Always, chicken coop and housing must be kept clean. If infected or dead chickens of any causes are detected, farmers should report to local livestock officials immediately. Do not trade infected or dead chicken. Proper handling and disposal of carcasses must be done according to the recommendations, e.g. deep landfilling and disinfect with antiseptic or lime, or burning to prevent transmission to other animals and humans.
2. Animal raisers and workers exposed to animals in contaminated farms should carry appropriate personal protective equipment. Protective clothing, apron, mask, gloves, glasses, boots are recommended. Wash the hands frequently, especially, after handling infected animals or carcasses.
3. Thoroughly clean the body with soap and water, and change new clothing after work. Dirty clothing and protective equipment should be cleaned or disinfected and dried in sunlight before re-used.

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2.1.6.2 Protective Measures for Children

1. Children are prone to infection due to their petting behavior. Once infected, children can be seriously ill. Therefore, during an outbreak in poultry population, parents should keep a close watch on children. Warn them not to handle any chicken or birds and not to carry any carcasses. Personal sanitation, especially, hand washing, is very important.

2. Children suspected of infection with respiratory disease should be taken to a health care facility as soon as possible. Generally, with a proper treatment and care, the patients will be better within 2-7 days. A close watch is necessary to detect any severity such as panting; the patients must be taken to a hospital immediately.

2.1.6.3 General Recommendations on Health Care and Health Behavior to Prevent Infectious Diseases.

1. Keep our body healthy. Good health results in good immunity against diseases. Consume appropriate food including vegetables and fruits. Quit smoking and stop drinking alcoholics. Sleeping adequately and exercising properly. Keep the body warm enough during cool weather.

2. If any signs of illness occur, e.g. fever, headache, chill, sore throat, cough, etc., report to a health care facility at once. Relevant information such as working in animal farms or having exposed to animal carcasses should also be reported.

2.1.6.4 Recommended Procedures for Proper Sanitation of Markets during an Outbreak

1. Where an outbreak occurred, properly clean the area at least once a week.
2. Get rid of spider webs, dirt and stains on the walls, lamps, fans etc.
3. Clean stalls and drains. Garbage must be kept at solid-wasting site or any site provided for such purpose. Also, kill insects and animal vectors inhabiting in the market.

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4. Mixture of water and soda can be used to clean greasy surfaces. Leave the mixture on applied surfaces for 15-30 minutes, then, scrub with a wire brush.

For heavily greasy area:

Prepare a mixture of 90 % caustic soda two tablespoons water 10 liters.

For less greasy area:

Prepare a mixture of 90 % caustic soda one tablespoon water 10 liters

5. Spray clean water to stalls, walkways, walls, and finally to the drains. Caustic soda and detergent will be washed away.

6. Mix water with chlorine powder (according to the following ratio), and fill in a watering can, then, apply to stalls, walkways, and drains. Chlorine will kill germs and eliminate unpleasant odor. Where fish smell occurs, apply to the area with the mixture of water and vinegar. Stalls selling poultry should be disinfected with chlorine every day (60 % chlorine powder one teaspoon water 20 liters).

7. For public restrooms, wash and clean toilets, basins, taps, and surroundings with detergent and water.

8. Solid waste management and disposal of garbage should be done properly. Then, clean and disinfect as in no. 6

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Table 2 Summarizing Avian Influenza Control in Humans in Thailand (23)

Measures	Implementation in usual areas	Implementation in areas with unusual death of birds (without having to wait for laboratory confirmation)
1. Management	• Form surveillance and rapid response team and rehearse operation response • Prepare support units	• Join with the provincial work team which has the provincial governor as chairman • Coordinate information with other units on a daily basis, particularly the Livestock Development authorities
2. Health education	• Provide information on disease prevention to the general public in advance	• Increase provision of health education in a pro-active manner in villages where there is spread of the disease and neighboring villages
3. Disease monitoring and investigation	• Identify patients among those who visit hospitals with pneumonia or severe fever • Immediately report and investigate suspected patients	• Identify additional patients from bird farms and villages where the spread of the disease has been reported for a continuous period of 14 days after the culling. • Report the number of patients on a daily basis. If no patients are identified, 'Zero report' should be specified for a continuous period of 14 days after the culling.
4. Treatment and care of patients	• Preparedness for diagnosis, drug screening and work area • Provide medication according to the standards specified	• If suspected, provide medication according to the standards specified • Strengthen surveillance and follow up measures on personals who have been taking care of patients for days after discharging suspected patients
5. Prevention for cullers	• Prepare documents, training materials and necessary tools if requested for	• Request for the list of names of cullers from the Livestock Development authorities and follow up on them for a continuous period of 7 days.

Source: Disease Control Department, Ministry of Public Health, Thailand. Appendix : Table summarizing Avian Influenza Control in Humans, July, 2004. Available from: www.moph.go.th/ (23).

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2.1.7 MEASUREMENT FOR CONTROL AVIAN INFLUENZA IN ANIMALS IN THAILAND

2.1.7.1 Surveillance for Avian Influenza in Animals in Thailand (24)

The Office of International des Epizooties classifies highly pathogenic avian influenza (HPAI) as a "List A" disease because it is highly lethal to poultry and has a major impact on poultry production and trade. Therefore, the Department of Livestock Development (DLD), Ministry of Agriculture and Cooperatives have been conducting an intensive surveillance program for avian influenza since 1997.

Project description The DLD surveillance program for avian influenza is composed of active and passive surveillance systems.

- Passive surveillance Passive surveillance relies on the existing DLD disease reporting system and laboratory surveillance network. Avian cases with clinical presentations similar to case definitions of severe infectious avian diseases, including Newcastle disease, avian influenza, fowl cholera and duck plague will be reported to the Veterinary Epidemiology Division, Bureau of Disease Control and Veterinary Services. Samples will be collected and sent to the National Institute of Animal Health or nearby Regional Veterinary Research and Development Centers.
- Active surveillance Active surveillance is conducted in many ways.

1) ND (Newcastle Disease) and AI surveillance project in 35 provinces 2) Slaughterhouse survey 3) Health certification and Quarantine program and 4) Migratory bird survey. Specimens are collected from apparently healthy birds in villages, slaughterhouses, aviaries of export pet birds, quarantine stations and locations where migratory birds stay. Sample size is calculated to give 95% confidence level. For slaughterhouse survey, sample size and collection procedure are according to the EU (European Economic Community) guidelines for ND sampling.

Laboratory procedure Specimens (internal organs, feces or cloacal swabs) are subjected to standard virological assays for avian influenza diagnosis as recommended by the OIE (Office of International Epizootics). A cloacal swab in antibiotic-containing transport media or a pool of minced visceral organs is prepared

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as a 10% suspension in PBS, and then centrifuged. Supernatant is collected and inoculated into 9 to 11-day-old embryonated eggs intra-allantoically. The eggs are incubated for 4 days; afterwards allantoic fluid is harvested and tested for hemagglutination (HA) activity. ND diagnostic assays are performed in pararell with AI in order to rule out ND infection. Hemagglutinating agents are subjected to agar gel precipitation test (AGPT) with influenza type A antiserum (Weybridge, UK). All type A influenza viruses detected will be tested for its virulence by chicken inoculation. Positive sample, if any, will be sent for confirmation, preferably, at the reference laboratory in Hong Kong (23).

2.1.7.2 Overall Operation for Prevention and Control in Animal (25)

Highly pathogenic avian influenza (HPAI) is a "List A" disease according to the OIE. Because of its highly pathogenic nature and destructive impact on poultry production and trade, the overall policy is eradication of the disease in the shortest period as possible to minimize all potential damages. HPAI is enlisted by the Ministry of Agriculture and Cooperatives as a highly contagious disease under the Animal Epidemic Act B.E. 2499 and its reversion in B.E. 2542, which allows strategic action of stamping-out, movement control, quarantine, compensation, and other necessary measures possible. January 2004 is the first time that highly pathogenic avian influenza outbreak occurred in Thailand. HPAI was detected in a layer farm, Bang Pla Ma district, Suphan Buri province, and central religion. The emergency plan for highly contagious avian diseases was launched immediately; all necessary measures and operations have been implemented. Details of the operations, which emphasize on tamping-out strategy, are summarized as follow.

1. **Pre-emptive culling:** Depopulation of chicken in farms and backyard chickens in the area within 5-kilometer radius from the infected farm, followed by disinfecting of the premises.
2. **Surveillance during the outbreak:** The area within 50 kilometers from an infected farm is on intensive surveillance. Any positive farms will be depopulated and disinfected.

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3. Movement control: Movement of avian species from the area within 60-kilometer radius is not allowed for at least 30 days.

4. Public awareness campaign: Information, recommendation and guidelines are distributed to facilitate cooperation and create good understanding from industry and the community. After stamping-out of the last affected premise the following plans will be executed in order to assure freedom from disease and, later, to monitor the existence of the virus and early detection of disease.

- **Tracing and surveillance:** After repopulation of the affected areas, surveillance will be carried out for 5 months to confirm freedom from disease.
- **Surveillance and monitoring:** After freedom from disease is assured active and passive surveillance for AI will be carried out in order to obtain epidemiological information for prevention and control.

2.1.7.3 Emergency Response for Avian Influenza Outbreak (25)

Phase I: During the outbreak

Policy and strategies Highly pathogenic avian influenza (HPAI) is a disease in "List A" of Office of International Epizooties (OIE) because of its highly pathogenic nature and destructive impact on trade. The policy set by the Department of Livestock Development, Ministry of Agriculture and Cooperatives is eradication of the disease as fast as possible to minimize potential damages. HPAI is enlisted in the highly contagious diseases under the Animal Epidemic Act B.E. 2449 (A.D.1956) and its reversion in B.E. 2542 (A.D.1999), which allows strategic actions of stamping-out, quarantine, movement control, compensation and other necessary measures possible.

Case definition

These criteria are established in order for early detection of the disease. Target animals include chicken, duck, quail and other avian species presented with the following clinical signs.

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1. Severe respiratory signs with excessively watery eyes and sinusitis, cyanosis of the combs, wattle and shanks, edema of the head, ruffled feathers

2. Diarrhea and nervous signs

3. No noticeable signs but sudden death of almost 100%, or cumulative death approximately 40% within 3 days if one of the above criteria is observed, the disease control measures must be executed immediately.

The operation

- Pre-emptive stamping-out if suspected case is identified, that premise will be quarantined. Samples will be collected and analyzed for avian influenza and other possible pathogens. If HPAI is confirmed, that particular premise will be depopulated and disinfected. All premises within 5-kilometer radius from the index farm will be depopulated and disinfected.

- Surveillance during the outbreak the area within 50 kilometers from infected farm is on intensive surveillance. Cloacal swabs will be collected and analyzed for the virus. If the virus is detected that infected farm will be depopulated and disinfected. Other premises in this zone (50 km. radius) are on quarantine.

- Movement control Movement of avian species and their products from the area within 60-kilometer radius from infected farms are prohibited. Checkpoints will be set up by the DLD to enforce the regulations.

- Public awareness campaign Information, recommendations and guidelines will be distributed to private sector, risk groups and general public to raise awareness and good understanding of the community.

<u>Phase II : Post-outbreak</u>

Principle and strategy

Repopulation of affected areas will be considered if no new case or death is detected 21 days after destruction of the last affected premise. If repopulation is allowed surveillance will be carried out for five months to confirm freedom from disease.

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Post-outbreak surveillance

Surveillance in the areas other than control zone (50 km. radius) includes testing of the flocks that show any clinical signs fit in the case definition. Virological and/or serological investigations will be conducted.

For control zone, sample collection for virological assays will be carried out in flocks at 30 days after repopulation, before selling and/or at five months to establish a 95% confidence of detecting infection in the flocks at less than 5%. Examination for AI includes twice weekly clinical examinations for 30 days then every two-week for 5 months, identification of virus or other pathogen will be performed on dead birds. Positive flock, if any, will be depopulated and disinfected. Necessary measures will be undertaken immediately to control the disease.

Post-outbreak surveillance entitled "Sanitary chicken project" is attached as (see in appendix A).

PHASE III: Long Term Surveillance and Monitoring

Principle and Strategy

Highly pathogenic avian influenza (HPAI) had never been reported in conducted since 1997 HPAI outbreak was unexpectedly occurred and spread widely. Stamping-out strategy was executed however carrier birds or migratory birds cannot be completely destroyed. For these reasons epidemiological information is very crucial in order for early detection of the disease. This objective can only be achieved by strengthening of surveillance.

National surveillance plan for avian influenza

National surveillance plan for AI is a long tern project, which composed of active and passive surveillance. The Government will grant budget annually. (Description of the plan can see in appendix A)

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2.2 KNOWLEDGE, ATTITUDES AND PRACTICE THEORY

Knowledge, Attitude and Practice Theory (KAP). The process of theory followed in steps: Knowledge, Attitude and Practice.

2.2.1 Concept of Knowledge

The Lexicon of Contemporary English Dictionary (26) defined knowledge as the fact or condition of knowing something with considerable degree of familiarity gained through experience or contact or association with the individual or thing. The fact must clear and relate to time.

Dictionary of Education (27) defined knowledge as fact, truth, principles and information to which the human mind has access, including the outcome of specified, information that human get and collect from many experiences.

Bloom (28) defined knowledge as the both specific and general recognition of various process or experiences by personal memory.

2.2.1.1 Level of Knowledge (28)

Bloom divided cognitive domain into 6 levels as follow:

1. Knowledge or recall which means the first step of memory about method, process, structure that can be use to describe definition, detail and truth.
2. Comprehension or understanding which mean practice or skill of translation, interpretations and extrapolation.
3. Application defined as practice or skill to understand and to correct problem by adaptation. To correct and demonstrate can be demonstrated in daily situation.
4. Analysis defined as procedure to break down components of problem, situation, according to conversation, rules and structure.
5. Synthesis means ability to rebuild conclusion for new process.

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6. Evaluation means ability to decide using given rule and standard.

The term "knowledge" in this study refers to the knowledge at level 1 and 2 consisting of recall and understanding, i.e. ability to recall to answer the questions correctly about sign and symptom of avian influenza involvement the prevention and control.

2.2.1.2 Measurements of Knowledge (28)

Bloom measured knowledge by the level of knowledge as followed:

1. The ability about recall, may be show as memory, recognize ability about the content, process, concept and theory.
2. The ability about interpretation and comprehensive when it was shown in table, chart, sign and another model.
3. The ability about adaptation, analysis, conclusion and evaluation of the content in some situation.

In this study, True – false testing would be selected to create the interview questionnaire. The question would be simplified, suitable and convenient for people that reduce the waste of time while answering.

2.2.2 Concept of Attitude

The Merriam Webster Dictionary of English Language (29) defined attitude as belief that don't depend on fact but it depend on the mind, opinion and each person conclusion. It is assessment of impression or quality assumption or virtue of person and object. It is each person decision.

Davis and Newstrom (30) defined attitude as feeling and belief that is change by environment. It is the mind that affects person response for their work. Attitude to work will affect work and administrative structure.

Ajzen (31) defined attitude as a learned pre – dispositions to respond in a favorable or unfavorable manner to particular person or object.

In summary, attitude means consciousness, like, dislike, agree, or disagree. It is ingredients from collecting experiences that may be tendentious to the difference practice.

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2.2.2.1 Attitude Components

There were many psychiatrists such as Fishbein (32), Lambert (33), Second and Backman (34), Triandis (35) who had opined similar attitude's component that can be classified into 3 types as the following:

Cognitive component that means ingredients of idea and understanding toward stimulus object by themselves.

1. Affective component that mean ingredients of emotion or feeling that can be positive or negative.
2. Behavioral component that means ingredients of behavior or stimulus to practice.

2.2.2.2 The Occurrence of Attitude (36)

The occurrence of attitude has 2 causes. There are:

1. **Personal experience** is experience that persons have to things, stores, personnel or situation. Direct experience is the situation that encounters themselves. Indirect experience is hearing, reading about something and the persons don't experiment with something themselves. The lack of experience can't make attitude.
2. **Value and the value decision.** Due to the fact that each group have the difference in value decision, each group may have difference attitude to the same things. The good or bad attitudes depend on culture and value of the standard group.

Conclusion: The occurrence of attitude must be influenced by environment, experience, hearing from external and the memory that can be blend for oneself attitude. However the attitude can be changed if the person is in new difference situation.

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2.2.2.3 Factors Affecting Occurrence and Changes of Attitude (37)

The factors related to the occurrence and the changes of attitude are such as individual component, communication with others, specific experiences. The details are followed:

1) Individual such as age, illness, education, difference personality can make up difference attitude.

2) Communication with others A person will have are attitude when communicates with another person. The personal attitude will be changed by peer group, social group and reference group due to the participating activities which satisfy mutually and are the cause of similar opinion, knowledge and attitude.

3) Institute factors Every institute has system of the number role. Attitude of a person will occur from the related institute.

4) Specific experiences A person has attitudes when one gets oneself experiences and impression consistently for a long time. It may be the positive or negative experiences.

2.2.2.4 The Attitude Measurement

Since the attitude measurement had been the measurement of trend that it seems to be a private feeling or subjective, the result of measurement may not be the truth. People's acting against something, either speaking or writing, will be appropriately meditated depending on social trend such as normal tradition, preference, acceptation and non – approval of people in society. As a result, nobody has found a direct measurement for attitude or feeling to use as an index of comparison. The measurement of attitude therefore is only the preference. So, it is only personnel estimation.

In this research will utilize the Likert's scale since it has been widely used, convenient, easy constructed, with high level of reliability. It covers several substances of both positive and negative aspects in equal numbers but ordering unspecifically.

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According to the above concept, the Likert's scale can be utilized to measure the attitude of respondents toward avian influenza by applying the rating scale with 3 choices: agree, not sure, disagree.

2.2.3 Behavior or Practice

There are many meanings of practice which provide by many persons as following:

Kothandapani (38) said about the practical determination that "the practical determine is based on knowledge (information), attitude, or belief."

Bloom and Others (39) said, "A practice or implementation is an ability to adopt the existing knowledge appropriately for solving any problems in new situations.

Suwan (40) concluded, "The human's practice is resulted from attitude, norm, habit, and result after the practice".

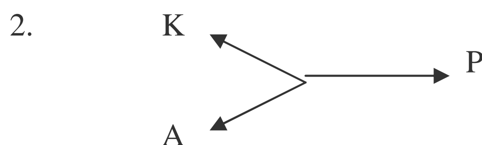
2.2.4 The Relationship between Knowledge, Attitude, and Practice

The relationship among knowledge, attitude and practice could be concluded that there are four types of relationship (41) as follows:

1.

Knowledge (K) has affected on Attitude (A), which affected on Practice (P).

2.



Knowledge (K) and Attitude (A) are related and shared the effect on Practice (P).

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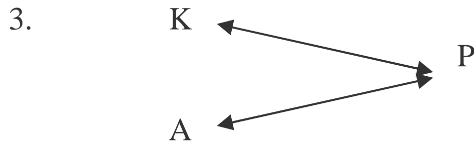
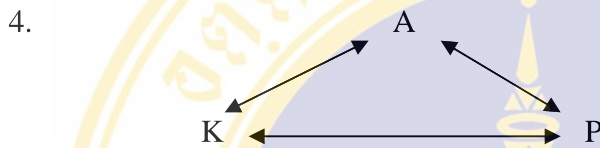
3.



Knowledge (K) or Attitude (A) has affected on Practice (P) but they are not related.

4.



Knowledge (K) has directly as well as indirectly affected on Practice (P), indirectly by stimulating Attitude (A).

As prevention and control of avian influenza of respondent, knowledge, attitudes, and practice also have relationships among each other. Knowledge and attitudes towards prevention and control of avian influenza affect role performance of health practice activities of respondent. In conclusion, if the respondents had correct knowledge on prevention and control of avian influenza, the knowledge would bring good attitudes towards avian influenza prevention, and the attitudes would be inspiration of proper role performance on the avian influenza prevention and control. All of that would cause effective and efficient prevention and control of the disease.

2.3. COMMUNITY PARTICIPATION AND DEVELOPMENT

2.3.1 The Concept of Community Participation

The concept of community participation or people's participation in development has come to have a major influence upon development thinking and practice. To understand community participation, it is useful to look at the two words separately (42).

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The term community is commonly used to refer to people grouped on the basis of geography and common interest, identity or interaction. It can thus be defined as:

"A group of people who share an interest, a neighborhood, or a common set of circumstances. They may or may not acknowledge membership of a particular community."

Community is a multidimensional concept involving a complexity of horizontal and vertical relationships between people and organizations. Use of the term is inevitably problematic, as discussed by Boutilier (43). De LE (44) expands on this to argue that communities are characterized by communication arrangements, highlighting the impact of change in technology in the late 20th century in challenging conventional understandings of community and opening up new of connectedness.

The term participation clearly implies several different things. Drawing on key literature the following working definition will be used:

"A process by which people are enabled to become actively and genuinely involved in defining the issues of concern to them, in making decisions about factors that affect their lives, in formulating and implementing policies, in planning, developing and delivering services and in taking action to achieve change' (45).

Community participation is often used interchangeably with or alongside a number of other terms, however, defines my single attempt at definition or interpretation; in many ways participation has become and umbrella term for a new and more people-centered approach to development intervention. Although there is no clear consensus on the distinction between these terms and without going into detail, it is useful to clarify the meanings of these (42).

- Consultation often forms an integral part of statutory urban planning processes and involves people being referred to for information and asked their opinions. Although this implies that communities' views may be taken into consideration, it has not generally meant that people are actively engaged in the decision-making process.
- Involvement is a term often used synonymously with participation. It implies being included as a necessary part of something.
- Citizenship – a word that comes from the Latin civilities,

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meaning "of or relating to city" – has been defined as having full membership of a community, involving the civil right to freedom and justice, the political right to participate in the exercise of political power and the social right to share in the quality of life enjoyed by society as a whole.

- Community action, a term used within the Ottawa Charter for Health Promotion, has been defined in a number of different ways but is generally understood to mean any activity undertaken by a community to effect change.

- Empowerment is a continual process whereby individuals and/or communities gain the confidence, self-esteem, understanding and power necessary to articulate their concerns, ensure that action is taken to address them and, more broadly, gain control over their lives.

- Community capacity – building is development work- involving training and providing access to support and resources – that recognizes existing capabilities and strengthens the ability of community organizations and groups to build structures, systems and skills that enable them to participate and take community action. Such capacity building may be developed through life-long learning and other routes. It is an essential part of a strategic approach to community participation within health promotion and sustainable development and must be complemented by parallel work with professionals and politicians within enabling organizations.

- Community development is a way of working groundwork by a commitment to equity, social justice and participation that enables people to strengthen networks and to identify common concerns and supports people in taking action related to the networks. It respects community-defined priorities, recognizes community assets as well as problems, gives priority to capacity building and is a key mechanism for enabling effective community participation and empowerment.

- Community organizing, a term originating in the United States and often used interchangeably with community development, is understood to be the process by which community groups are helped to identify common problems or goals, mobilize resources, and in other ways develop and implement strategies for reaching goals they collectively have set.

In conclusion, community participation is the educational and empowering

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process in which people or community groups identify common problems or goals, mobilize resources, and increasingly assume responsibility them to plan, manage, control and assess the collective actions that are proved necessary.

2.3.2 The importance of Community Participation

Community participation is important for many different reasons and offers many different benefits for individuals, communities, organizations and society as a whole (46). These benefits relate to both the process and the effects and outcomes of participation – participation as an end in it and participation as a means to achieve other goals (42).

Community participation can make an important contribution to achieving a number of objectives, as detailed below (47).

- Increasing democracy: Community participation in decision-making, planning and action is a human right. An increasing number of citizens are disillusioned with government and want to see more participatory approaches to democracy. It is increasingly being argued that new styles and structures of governance are needed that transcend people being viewed as passive recipients of services provided by agencies and decided by elected representatives and enable genuine participation, empowerment and citizenship.
- Combating exclusion: Community development and community organizing often work with specific groups of the population especially, those that are marginalized and disadvantaged. According to WHO, the changing contexts within and between European countries (such as the increase in asylum seekers) can pose special cultural and political challenges and require that workers be equipped with relevant skills, knowledge and attitudes. By giving these communities a voice, community participation can play an important role in combating social exclusion within society.
- Empowering people: Community participation can be both an outcome of empowerment and an effective empowerment strategy. The actual process of participation can inherently empower individuals and communities to understand their own situations and to gain increased control over the factors affecting their lives. This

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can, in turn, enhance people's sense of well-being and quality of life, as highlighted in health

- Mobilizing resources and energy: Communities have a wealth of untapped resources and energy that can be harnessed and mobilized through community participation, using a range of practical techniques that can engage people and, where appropriate, train and employ them in community development work. There is a clear tension here between mobilizing resources in a way that empowers communities and mobilizing to reduce the cost of providing services.

- Developing holistic and integrated approaches: Ordinary people do not tend to compartmentalize their thinking in the way that many professionals have been trained to do. They can thus make a valuable contribution to the formulation of holistic and integrated crosscutting approaches that can meaningfully address the complex issues being faced by towns and cities so long as professionals are prepared to work with them on the issues they define as important, whether or not labels such as "health" and "sustainable development" are used.

- Achieving better decisions and more effective services: Involving people in identifying needs, planning and taking action can result in better and more creative decisions being taken and more responsive and appropriate services being provided.

- Ensuring the ownership and sustainability of programs: Community participation is essential if interventions and programs aimed at promoting health, well-being, quality of life and environmental protection are to be widely owned and sustainable. However, such sustainability requires that the community participation process itself be sustainable, with fundamental prerequisites being in place.

2.3.3 Levels of Community Participation

Community participation has different degrees or levels of participation as seen in Figure 4. The challenge for many people working in local authorities, health authorities and other agencies is to move up the ladder, finding new tools and techniques that promote active and genuine involvement, citizenship and empowerment rather than settling for the more passive processes of providing

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information and consultation. Clearly, this style of participation can only flourish in societies with a political culture that encourages it and, as highlighted above, a number of commentators have for new systems of governance that support this approach (47).

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Table 3 a Ladder of Community Participation: Degree of Participation, Participants Action and Illustrative Modes for Achieving it.

Control	Participant's action	Examples
High	Has control	Organization asks community to identify the problem and make all key decisions on goals and means. Willing to help community at each step to accomplish goals.
	Has delegated authority	Organization identifies and presents a problem to the community. Defines limits and asks community to make a series of decisions which can be embodied in a plan which it will accept.
	Plans jointly	Organization presents tentative plan subject to change and open to change from those affected. Expects to change plan at least slightly and perhaps more subsequently.
	Advises	Organization presents a plan and invites questions. Prepared to change plan only if absolutely necessary.
	Is Consulted	Organization tries to promote a plan. Seeks to develop support to facilitate acceptance or give sufficient sanction to plan so that administrative compliance can be expected.
	Receives information	Organization makes plan and announces it. Community is convened for informational purposes. Compliance is expected.
Low	None	Community has told nothing.

Source: adapted from Brager & Specht (1973). Community Organizing. New York. Columbia University Press (48).

If community participation is to be sustainable and effective, it must be developed and practiced in a coherent, coordinated and strategic way. The notion of

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sustainable infrastructures, which in this form is new to the 1990s, has reinforced the need to see work around community involvement in health as an ongoing, continuous and strategic activity rather than as a series of ad hoc or "pilot" projects which remain outside the mainstream of an organization's endeavors. This means that action to enable community participation must take place in a number of ways at a number of different levels. It should include support for grassroots community level capacity building and development, the establishment and strengthening of networks and infrastructures for communities and professionals and a commitment to meaningful organizational development (46).

Resourcing grassroots work and local action with both geographical communities and communities of interest is usually the starting-point in enabling community participation. This process is long term, involving the establishment of trust and mutual respect between communities especially those often excluded and professionals, investment in capacity building and a concern to work with communities to address their priorities (49).

Developing community participation and increasing its influence requires facilitating the development of community and professional infrastructure. This can enable communities, development workers and professionals within organizations to network-sharing common experiences, learning from each another, strengthening competencies and building alliances (49).

2.3.4 Community Stakeholders

Community participation can contribute greatly to the effectiveness and efficiency of a program; the crucial factor in its success is the attitude of agency staff in the field. If staff does not treat people with respect or are seem to favor particular individuals or groups within a community, this can have a highly destructive effect on participation (50). For this reason it is important to identify key representatives and groups within the affected population early.

"Community Stakeholders" are people, groups, or institutions, which are likely to be affected by a proposed intervention (either negatively or positively), or those which can affect the outcome of the intervention (51).

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2.3.4.1 Stakeholder Analysis

It may not be possible for each and every member of the affected population to contribute to a program equally but attempts can be made to identify key groups and individuals that can be actively involved.

"Stakeholder Analysis" is a vital tool for understanding the social and institutional context of a project or policy. Its findings can provide early and essential information about who will be affected by the project (Positively or negatively); who could influence the project (again, positively or negatively); which individuals, groups, or agencies need to be involved in the project, and how; and whose capacity needs to be built to enable them to participate. Therefore, the main proposes of "Stakeholder Analysis" are (50):

- To identify stakeholders interests in, importance to, and influence over operation;
- To identify local institutions and processes upon which to build; and to provide a foundation and strategy for participation.

Stakeholder Analysis therefore, provides a foundation and structure for the participatory planning, implementation, and monitoring that follows.

Stakeholder Analysis is essentially a four-step process (50). This page and those that follow describe each step in the analysis, indicate who should be involved in the work, and then provide a series of matrices that can help to guide the process.

- The first step of a stakeholder analysis is to identify the key stakeholders - whose participation will be sought - from the large array of institutions and individuals that could potentially affect or be affected by the proposed intervention.
- The second step is to assess stakeholder interests and the potential impact of the project on these interests.
- The third step is to assess stakeholder influence and importance. Influence refers to the power that stakeholders have over a project. It can be exercised by controlling the decision-making process directly and by facilitating or hindering the project's implementation. This control may come from a stakeholders status or power, or from informal connections with leaders.

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- The last step is to outline a stakeholder participation strategy.

2.3.4.2 Selecting the Key Stakeholders (50).

The focus of this paper is the local community, but other types of stakeholder also need to be involved if the external input to decision-making is not to be dominated by one perspective or set of interests. Stakeholders are much less likely to respond constructively in future if they feel unfairly excluded.

Internal or external stakeholders that have a reasonable degree of commonality of interest with the organization in question are the most obvious category of stakeholder, and are sometimes referred to as 'true stakeholders.' There is however other classes of stakeholder that are affected by the decisions an organization takes or have a strong view on its conduct, even if their interests are very different.

Organizations require a 'license to operate' from a wider range of stakeholders. This is obvious in the case of regulators such as the Health & Safety Executive, where authority has been delegated by society. The right of shareholders to regulate the direction of a business is also readily appreciated. In practice however, organizations find that their 'license to operate' can also be compromised or even withdrawn because they have lost the consent of the local community in which they open rate, or they have lost the confidence of politicians and financiers. Campaign groups often see themselves as having a "license to operate," but they are also often significant as opinion formers able to influence other stakeholders. The media are sometimes considered to be stakeholders, but are more often considered separately with other opinion formers, on the basis that there is usually no strong commonality of interest. They may have considerable influence on other stakeholders and may also be seen in turn as an indicator of a broader, unobserved, public mood.

A community cannot be treated as a single entity. Relationships between the site and the community are complex and all the different types of stakeholder described above are contained within it. The people who live around the site and the community groups, and local authorities that speak for them, have a wide range of inter-relationships and perspectives. In reality, there is no such a thing as "the community view" and this has to be born in mind in reading the sections that follow.

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2.3.5 Incentives of Community Participation

The following are some of the main reasons why people are usually willing to participate in humanitarian programs (52):

- Community participation motivates people to work together – people feel a sense of community and recognize the benefits of their involvement.
- Social, religious or traditional obligations for mutual help.
- Genuine community participation – people see a genuine opportunity to better their own lives and for the community as a whole.
- Remuneration in cash or kind

There are often strong genuine reasons why people wish to participate in programs. All too often aid workers assume that people will only do anything for remuneration and have no genuine concern for their own predicament or that of the community as a whole. This is often the result of the actions of the agency itself, in giving money or food at community members without meaningful dialogue or consultation. Remuneration is an acceptable incentive but is usually not the only, or even the primary, motivation.

2.3.6 Disincentives to Community Participation

The following are some of the main reasons why individuals and/or community may be reluctant to take part in community participation (52):

- An unfair distribution of work or benefits amongst members of the community.

- A highly individualistic society where there is little or no sense of community.
- The feeling that the government or agency should provide the facilities.
- Agency treatment of community members – if people are treated as being helpless they are more likely to act as if they are.

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Generally, people are ready and willing to participate; the biggest disincentive to this is probably the attitude and actions of the agency concerned. Treating people with respect, listening to them and learning from them will go a long way toward building a successful program; it will also save time and resources in the long run and contribute greatly to program sustainability. Field workers who expect members of the affected community to be grateful for their presence without recognizing and empathizing with them as people may satisfy their own egos but will have little other positive effect.

2.4. EMPOWERMENT EDUCATION TECHNIQUE

2.4.1 The Development of Empowerment Education Model

The concept of empowerment, initiated and published in English by Paulo Freire, a Brazilian educator, was initially acknowledged in the education discipline in 1950. Freire taught empowerment through literacy education in his native Brazil (53). Freire genuinely believed that education is the foundation of knowledge in which individuals must develop in order to gain self-acknowledgement, self-confidence, self-efficacy, problem solving, decision-making, and collaborative ability. Therefore, the concept of empowerment is applied to educational delivery system to encourage students to participate in critical thinking and brainstorming.

The concept is widely used and has been developed in numerous developing and developed countries. Gibson (53) stated, “Empowerment is a complex multi-dimensional concept”. However, the concept of empowerment lacks a clear definition in which each person defines it within one’s own experiences (53). Empowerment is rooted in the “social action” ideology in the 1960s, and developed into self-help perspectives in the 1970s (53). Rappaport (54) had used the concept in 1981 to stimulate and to guide mental health policies.

Empowerment has emerged out of the realization that clients have rights. They cannot be forced to follow a life style dictated by health-care professionals. Health care professionals have a role in helping clients to make appropriate choices to take

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responsibility for their self-care. The major assumptions contained in the empowerment philosophy (55) include the following:

1. Human beings have physical, intellectual, emotional, social and spiritual components to their lives interact in a dynamic fashion.
2. To be healthy, human beings must be able to actualize the physical, intellectual, emotional, social, and spiritual components of their lives.
3. Human beings have the inherent right and responsibility to make the major decisions regarding the conduct of their own lives.

2.4.2 Concept of Empowerment

Empowerment is a transactional concept because the process involves a relationship with others. Although empowerment involves an individual demand, it is nurtured by the effects of collaborative efforts (56). Additionally, empowerment increases one's self-esteem and self-efficacy or the promotion of positive health behavior in individuals (57).

Katz (58) and Bernstein (59) viewed empowerment as a synergistic paradigm in which people are interrelated and encouraged. The concept is coping skill, mutual support, consensus, sharing and participatory decision-making, and genuine respect for partners, so trust should be fostered across groups. It is similar that Connelly et al. (60) described four levels of client's empowerment: participating, choosing, supporting and negotiating. Participating involves increased active involvement in the process of care. Choosing involves making personal choices and experiencing the consequence of the choices. It is the personal freedom to make choices. Supporting involves the process of moving beyond the individual's internal world to sharing the experience with others by giving and receiving mutual support. Negotiating is the fourth stage of empowerment by working collaboratively with others, such as a health care team, a colleague who has same interesting issues or problems, partnerships or stakeholders as well as family members. Gibson defined empowerment as the process that help some one to realize their problems, and their causes and solve them with wisdom or process help to restore recognition, promoting and enhancing people's ability in response to their need, in solving problems themselves and in mobilization of the necessary

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resources for daily life. These results in self-confidence, self-powerfulness and self-regulation of own daily life (61).

Power is basically divided into two sources: intrinsic and extrinsic power (62). Intrinsic power is developed from recognition of body image, knowledge, self-control and identity. External power is critically important for the ones who feel of powerless. It is crucial for the health team to recognize and provide it for them by group process or others like charging battery storage.

Empowerment can be considered in both the process and the results. It is vary in the pattern; target persons and situations. So it is difficult to define it strictly (63). Resolution of the problems, not the problems, is the major aim of the process by strengthening human power. It is a dynamic process for exchanging the power between individual and individual or organization or society for strengthening the power of control of daily livings by self or in cooperation with the others (54).

Empowerment is a process of helping people to assert control over the factors, which affect their lives. This process encompasses both the individual responsibilities in health care and the broader institutional, organizational or societal responsibilities in enabling people to assume responsibility for their own health.

2.4.3 The Significance of Empowerment

Empowerment is a social process that promotes an individual, organization and community self-control, an ability to make decision and determine individual's organization's and community's future. Empowerment is a process that individuals work together in the society with the aim to make the change in the desirable direction but it is not the power to force or oppress others (64). This internal power is the thing that individual/group of individuals must develop by her/him self/by the group of individuals themselves. It has been believed that the situation whereby the individual has powerless will cause a lot of problems including health problems. Therefore empowerment means oppositely with powerless or empowering whereby the people who have been empowered will fell that they do not have any power (powerless), are not willing to control any situation, ignore do not respond to any stimuli, and lack of motivation. Powerless may be caused by an individual allows other persons empower

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him/her self (Empowerment Education Model). Regarding the individual empowered him/her self or let others empower him/herself, it may be caused by the individual's self-concept, by other people or by the system itself that try to have power over that individual, do not want to have some changes, or get the feeling toward other persons as disability, can not be self-directed, must be of oppressed or led by others. Therefore, with this feeling, those people are not allowed to express their opinion, have not been motivate, or even get involved, etc. Empowerment is important in implementing the new concept of health promotion, whereby the World Health Organization has recommended strengthening the participation of individuals and community through getting more information, developing skills and self-esteem in order to be able to control or determine their own health (65). Formally, when empowerment concept has been applied in health education program, individual empowerment was emphasized to enhance an individual ability to make decision an have control over his or her personal life, but presently, the role of health education is also emphasized on community change, the empowerment should be aimed for developing policy and changing environments that conducive to community health (65).

2.4.4 Principles of Empowerment

In empowering individual, group and community, the principles are as follows (66):

1) To empower people by supporting learner to realize relationship between themselves and environment and promote perception of self-worth to change their own health, including the health of community and society.

2) The starting point is forming the concrete experience of the learner, then critically assessing the social role of their problems and develop action strategies to change their personal and social life.

3) Involving a high level of participation in every step, starting form selecting the interesting and significant issues to be learned, planning the activities, involving in dialogue and implementing of the activities, self-evaluation and program evaluation.

4) Collection learning should be emphasized. It is assumed that everyone is learning together, everyone teaches, everyone learns. Teacher's role is changed to be a facilitator or coordinator instead of transmitter of knowledge. Through the group

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process whereby learners can exchange their knowledge, opinions, experiences, it is not only promoting individual learning but also develop a sense of being in a group that thinks and acts together which this powerful group learning can lead to solve problems or change something to meet the target goals.

5) The aim should be emphasized on change which composed of changing knowledge, attitudes, feeling, and skills. These changes may be immediate or take time to change after the individuals take actions.

6) It is a continuous process that does not limited only in the classroom since learners can learn from concrete experience and from their own actions.

7) It is a flexible educational process and fun by modifying content, methods and materials appropriately with needs of learners and the group. The learners do not feel that they are forced to study the non-related or non-significant issues or forced to do the things that they do not have ability to do.

8) The learning of objectives must be clearly stated which can be able to select appropriate procedures, techniques, instruments and activities, to help learners learn and serve the objectives as stated.

2.4.5 Process and Outcome of Empowerment Education

The dimension of empowerment are varied, it can be process and outcome for individual development, the process dimension means interaction among people in allocation of power or mobilizing mutual power, helping people improve their own potentially and cooperate with other persons for improving society. For the outcome dimension, it means the effect an empowerment training, which consisted of ability, efficiency, and strength in living his/her life or performing any activities in daily life (57). Regarding the assessment is the measurement of self-esteem and self-efficacy. The second idea is the measurement of the outcome-related as the produce from being involved in the group's activities by measuring social network, social support on individual's satisfaction of having interaction with other persons on getting together in the group. And the third idea is the measurement of the changes of the environment on health status (65). For this project, the outcome of the empowerment program was

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measured based on the first idea whereby self-esteem and self-efficacy of key communities and household representatives were measured.

There are many recommendations about organizing teaching-learning experience for empowerment, base on different concepts and theories, i.e. active learning, interactive learning through action or participatory learning through action (PLA); experiential learning, self-centered learning, including other working and research procedures which were believed to be effective procedures for learning and empowerment, e.g. participatory rural appraisal (PRA), participatory research (PR) or participatory action research (PAR), future search conference (FCR), etc. These mentioned procedures are based on the common concepts of getting direct involvement and interaction with other persons, dialogue that provides opportunity to think critically and diversely, to see difference alternatives including reasons and consequences of each alternative, to be able to make reasonable decisions, whereby these characteristics reflect the person's power (57). For this study, the concept of participatory learning and adult learning were applied in organizing an empowerment program for key community stakeholders because the concepts were relevant to problem situation and the study's context.

2.4.6 Empowerment in Health

Empowerment in health, has traditionally been defined as powerless, the belief that oneself cannot determine the occurrence of outcomes. Rappaport (54) defined empowerment as a process by which individuals, organizations and communities gained mastery over their lives.

Israel (63), Wallenstein & Bernstein (64), empowerment also differs across levels of analysis at 3 levels as follows:

1) Individual/psychology empowerment refers to an individual ability to make decisions and have control over his/her personal life; includes participator behavior, motivations to exert control, and feelings of efficacy and control by emphasizing on the development of the positive self-concept/personal competence.

2) Organizational empowerment is democratically managed and includes shared leadership, opportunities to develop skills, expansion and effective community

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influence. Members share information and power, utilize cooperative decision-making processes, involve in design, implementation, and control of effort towards mutually defined goal. The organizations influence over policies and decision making in the larger community.

3) Community empowerment is one by which individuals and organizations apply their skills and resources in collective effort to meet their respective needs; and include opportunities for citizen participation in community decision-making and allow for fair consideration of multiple perspectives during times of conflict. So it embodies an interactive process of change, where communities become transformed as people who participate in changing them become transformed. Rather than pitting individuals against community and overall society needs, the empowerment focuses on both individual and community change.

Conclusion: Empowerment defined as giving power or authority to, giving ability enabling, and permitting. Empowerment occurs when power goes to employees who experience a sense of ownership and control over their jobs. Empowerment is facilitated by a combination of factors including values, leadership actions, job structure, training, and reward systems. Empowerment is the process of achieving continuous improvement in an organization's performance by developing and extending the competent influence of individuals and teams over their areas and functions, which affect their performance and the total organization.

2.5. PARTICIPATORY LEARNING AND ACTION TECHNIQUE

Kolb (67) developed the experiential learning process bases on the educational theories and concepts developed by Lewin, Dewey, and Piaget. The experiential learning is a continuous learning process, which composed of 4 components: concrete experience; reflection observation; abstract conceptualization; and active experimentation. Later on, Nicole et al. (68) had integrated the experiential learning process with group process and named it as participatory learning.

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2.5.1 Component of Participatory Learning (69)

The important principle of learning is to develop maximum learning in the learner through maximum participation and reach maximum performance. The four components are as follows:

1) **Experience:** Have learners brought their experience to develop the new body of knowledge.

2) **Reflection and discussion:** Learners should have an opportunity to express their opinion in order to exchange ideas, to develop mutual learning, to come up with varied conclusions, and to work as a team.

3) **Understanding and conceptualization:** The learners initiated their understanding and added to make it complete by the instructor or in the opposite way, the instructor guided and then learners made it complete until they formed their concepts.

4) **Experimentation/application:** Have learners put the new things learned in various situations until the learners find the guideline to perform some behaviors by themselves.

2.5.2 Experiential Learning

Experiential learning is the learning that the teacher emphasized on the learners created their learning from their former experience. There are 5 significant characteristics of experiential learning as follows:

1) The learning that depends on learners' experience.

2) It helps to create challenged new learning continuously and an active learning.

3) There is an interaction between learners themselves and between learners and teachers, which helped create the reflection and dialogue. The interaction occurred could expand the network of information that every member holds which will lead to understanding and conceptualization. There is a communication process through dialogue or writing, which are the media for exchanging, analysis, synthesis and application of the new learning to various situations until they can conceptualize the guideline to perform specific behavior.

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2.6 SOCIAL COGNITIVE THEORY

Social Cognitive Theory is an updated version of social learning theory, both of which were developed by Albert Bandura (70). Bandura advanced a view of human functioning that accords a central role to cognitive, vicarious, self-regulatory, and self-reflective processes in human adaptation and change. People are viewed as self-organizing, proactive, self-reflecting and self-regulating rather than as reactive organisms shaped and shepherded by environmental forces or driven by concealed inner impulses. From this theoretical perspective, human functioning is viewed as the product of a dynamic interplay of personal, behavioral, and environmental influences. For example, how people interpret the results of their own behavior informs and alters their environments and the personal factors they possess which, in turn, inform and alter subsequent behavior. This is the foundation of Bandura's conception of *reciprocal determinism*, the view that personal factors in the form of cognition, affect, and biological events, behavior, and environmental influences create interactions that result in a *triadic reciprocality*. Bandura altered the label of his theory from social learning to social "cognitive" both to distance it from prevalent social learning theories of the day and to emphasize that cognition plays a critical role in people's capability to construct reality, self-regulate, encode information, and perform behaviors.

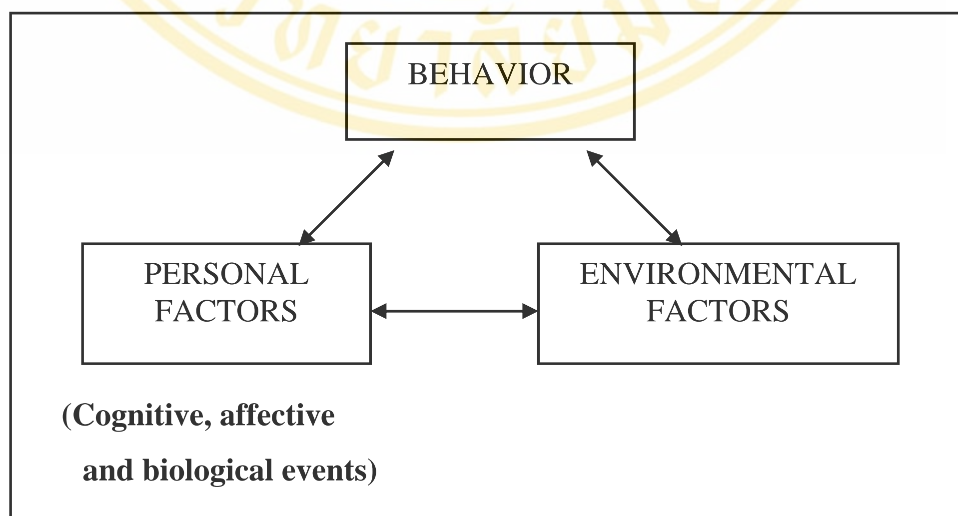

Figure 2 Diagram of Social Cognitive Theory

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The reciprocal nature of the determinants of human functioning in social cognitive theory makes it possible for therapeutic and counseling efforts to be directed at personal, environmental, or behavioral factors. Strategies for increasing well-being can be aimed at improving emotional, cognitive, or motivational processes, increasing behavioral competencies, or altering the social conditions under which people live and work. Social cognitive theory is rooted in a view of human agency in which individuals are agents proactively engaged in their own development and can make things happen by their actions. Key to this sense of agency is the fact that, among other personal factors, individuals possess self-beliefs that enable them to exercise a measure of control over their thoughts, feelings, and actions, that “what people think, believe, and feel affects how they behave”(70). Bandura provided a view of human behavior in which the beliefs that people have about themselves are critical elements in the exercise of control and personal agency. Thus, individuals are viewed both as products and as producers of their own environments and of their social systems. Because human lives are not lived in isolation, Bandura expanded the conception of human agency to include collective agency. People work together on shared beliefs about their capabilities and common aspirations to better their lives. This conceptual extension makes the theory applicable to human adaptation and change in collectivistic ally-oriented societies as well as individualistically oriented ones.

Environments and social systems influence human behavior through psychological mechanisms of the self-system. Hence, social cognitive theory posits that factors such as economic conditions, socioeconomic status, and educational and familial structures do not affect human behavior directly. Instead, they affect it to the degree that they influence people’s aspirations, self-efficacy beliefs, personal standards, emotional states, and other self-regulatory influences. In all, this social cognitive view of human and collective functioning, which marked a departure from the prevalent behaviorist and learning theories of the day, was to have a profound influence on psychological thinking and theorizing during the last two decades of the twentieth century and into the new millennium.

- **Self-efficacy Beliefs**

Of all the thoughts that affect human functioning, and standing

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at the very core of social cognitive theory, are **self-efficacy** beliefs, "people's judgments of their capabilities to organize and execute courses of action required to attain designated types of performances." Self-efficacy beliefs provide the foundation for human motivation, well-being, and personal accomplishment. This is because unless people believe that their actions can produce the outcomes they desire, they have little incentive to act or to persevere in the face of difficulties. Much empirical evidence now supports Bandura's (10) contention that self-efficacy beliefs touch virtually every aspect of people's lives – whether they think productively, self-debilitating, pessimistically or optimistically; how well they motivate themselves and persevere in the face of adversities; their vulnerability to stress and depression, and the life choices they make. Self-efficacy is also a critical determinant of self-regulation. Of course, human functioning is influenced by many factors. The success or failure that people experience as they engage the myriad tasks that comprise their life naturally influence the many decisions they must make. Also, the knowledge and skills they possess will certainly play critical roles in what they choose to do and not do. Individuals *interpret* the results of their attainments, however, just as they make judgments about the quality of the knowledge and skills they posses.

Bandura's (10). A key contention as regards the role of self-efficacy beliefs in human functioning is that *"people's level of motivation, affective states, and actions are based more on what they believe than on what is objectively true."* For this reason, how people behave can often be better predicted by the beliefs they hold about their capabilities than by what they are actually capable of accomplishing, for these self-efficacy perceptions help determine what individuals do with the knowledge and skills they have. This helps explain why people's behaviors are sometimes disjoined from their actual capabilities and why their behavior may differ widely even when they have similar knowledge and skills. For example, many talented people suffer frequent (and sometimes debilitating) bouts of self-doubt about capabilities they clearly possess, just as many individuals are confident about what they can accomplish despite possessing a modest repertoire of skills. Belief and reality are seldom perfectly matched, and individuals are typically guided by their beliefs when they engage the world. As a consequence, people's accomplishments are generally better predicted by their self-efficacy beliefs than by their pervious attainments, knowledge, or skills. Of

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course, no amount of confidence or self-appreciation can produce success when requisite skills and knowledge are absent.

People's self-efficacy beliefs should not be confused with their judgments of the consequences that their behavior will produce. Typically, of course, self-efficacy beliefs help determine the outcomes one expects. Confident individuals anticipate successful outcomes (www.emory.edu/EDUCATION/). For example, students confident in their social skills anticipate successful social encounters. Those confident in their academic skills expect high marks on exams and expect the quality of their work to reap personal and professional benefits. The opposite is true of those who lack confidence. Students who doubt their social skills often envision rejection or ridicule even before they establish social contact. Those who lack confidence in their academic skills envision a low grade before they begin an examination or enroll in a course. The expected results of these imagined performances would be differently envisioned: social success or greater career options for the former, social isolation or curtailed academic possibilities for the latter. Because individuals operate collectively as well as individually, self-efficacy is both a personal and a social construct. Collective systems develop a sense of collective efficacy – a group's shared belief in its capability to attain goals and accomplish desired tasks.

- **How Self-Efficacy Beliefs Are Created**

According to Bandura' SCT (10) individuals form their self-efficacy beliefs by interpreting information primarily from four sources. The most influential source is the interpreted result of one's previous performance, or *mastery experience.* Individuals engage in tasks and activities, interpret the results of their actions, use the interpretations to develop beliefs about their capability to engage in subsequent tasks or activities, and act in concert with the beliefs created. Typically, outcomes interpreted as successful raise self-efficacy; those interpreted as failures lower it. Of course, people who possess a low sense of efficacy often discount their successes rather than change their self-belief. Even after individuals achieve success through dogged effort, some continue to doubt their efficacy to mount a similar effort. Consequently, mastery experiences are only raw data, and many factors influence how such information is cognitively processed and affects an individual's self-appraisal.

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In addition to interpreting the results of their actions, people form their self-efficacy beliefs through the *vicarious experience* of observing others perform tasks. This source of information is weaker than mastery experience in helping create self-efficacy beliefs, but when people are uncertain about their own abilities or when they have limited prior experience, they become more sensitive to it. The effects of modeling are particularly relevant in this context. Especially when the individual has little prior experience with the task. Even experienced and self-efficacious individuals, however, will raise their perceived self-efficacy even higher if models teach them better ways of doing things. Vicarious experience is particularly powerful when observers see similarities in some attribute and then assume that the model's performance is diagnostic of their own capability. For example, a girl will raise her perceived physical efficacy on seeing a woman model exhibit physical strength but not after seeing a male model do so. In this case, gender is the attribute for assumed similarity. Observing the successes of such models contributes to the observers' beliefs about their own capabilities ("If they can do it, so can I!"). Conversely, watching models with perceived similar attributes fail can undermine the observers' beliefs about their own capability to succeed. When people perceive the model's attributes as highly divergent from their own, the influence of vicarious experience is greatly minimized. It bears noting that people seek out models that possess qualities they admire and capabilities to which they aspire. A significant model in one's life can help instill self-beliefs that will influence the course and direction that life will take.

Individuals also create and develop self-efficacy beliefs as a result of the social persuasions they receive from others. These persuasions can involve exposure to the verbal judgments that others provide. Persuaders play an important part in the development of an individual's self-beliefs. But social persuasions should not be confused with knee-jerk praise or empty inspirational homilies. Effective persuaders must cultivate people's beliefs in their capabilities while at the same time ensuring that the envisioned success is attainable. And, just as positive persuasions may work to encourage and empower, negative persuasions can work to defeat and weaken self-efficacy beliefs. In fact, it is usually easier to weaken self-efficacy beliefs through negative appraisals than to strengthen such beliefs through positive encouragement.

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2.7 RELEVANT RESEARCH

A descriptive study of behavioral factor by Arichokchai (5) researched on clinical symptom and risk factors data collected by interview the patients and relative. The information from the interview was used to formulate hypothesis the risk factor of bird flu. The hypothesis was tested by matched case control study (1:4). The control case was a person from the same village where the patient lived and was recruited in the same year. The results were found that between January 6 to February 13, 2004, 12 cases of bird flu occurred (8 males and 4 females) in 9 provinces including Suphan Buri, Kanchana Buri, Sukhothai, Uttaradit, Lopburi, Chaiyapoom, Khonkaen, Nakhornrachasima, and Pathumtani. Age average was 10 years (2-8 years), incubation period average was 4 days (2-8 days). All of leading symptom was fever (100%), cough (83.3%), secretion and dyspnia (50%), respectively. Patients had history of cutting chicken 2 cases (16.7%), cutting infected chicken 3 cases (25%), contacting infected chicken 7 cases (58.3%), contacting dead chicken 8 cases (56.7%), and keeping dead chicken in house 6 cases (50%). The results from the analytical method showed that highest risk factor of bird flu were keeping dead chicken in house (OR=16.7: 33.3-84.6), contacting dead chicken (OR=11.0: 2.7-45.4), and contacting infected chicken (OR=9.2: 2.3-37.2), respectively. The conclusion from the studies stated that the outbreak of bird flu in human was found only in the area where the outbreak of avian flu occurred and the risk factor of bird flu was avian contact. The highest risk factor was direct and in-direct contact of infected or dead chicken as well as keeping dead chicken in the house. Therefore, method to prevent and control the disease must focus closely on motivation of people to understand how to keep and eradicate sanitarily dead animals, avoid contacting, and eating dead chicken, and to destroy infected avian in the outbreak area rapidly.

Study of Knowledge, Attitude, and Practice

Prapasiri (9) conducted a cross-sectional study focusing on knowledge, attitude, and practice from people in community, Nakhon Phanom. The study aimed to compare knowledge, attitude, and practice on bird flu before and after intervention.

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Data collection was obtained by interview 200 samples, age equal or greater than 18 years old selected by cluster method from Nakhon Phanom. Interviewer have got training and tried out the instrument before the study began. Dada collection was performed from August 25 to 31, 2004. The results were found that most of the samples (>98%) received information about avian influenza from mass media especially television. Knowledge between before and after the outbreak was statistically significant. Attitude to prevent avian influenza was also statistically significant. On the other hand, behavior was not changed since people still used to behave what they have done. Consequently, the way to prevent bird flu was not changed such as no protecting of children to contact the dead animal, preparing and eating dead animal in house, using the same chopping block to cut everything for meal, no scrubbing hands immediately after preparing meat for food. Inclusion, samples specified that they had changed behavior in contacting avian or avian production 31.6 %.

Health Education Division, Department of Health Service studied health behavior for prevention avian influenza (the second round July 24-27, 2004) among people who domicile in contaminated areas found that 68.50% of people don’t know that avian influenza transmitted if contact with snivel, saliva or feces of poultry. 69.10% of people don’t know that person was sick avian influenza symptoms characterized high fever, headache, myalgia, sore throat and cough or pneumonia. 70.50% of people don’t know that symptoms characterized high fever and have history of contact with chicken or poultry, should be suspected infection avian influenza and must be take to a doctor immediately (71).

Study of Virus Mutation after Vaccination

Lee (72) studied the impact of avian influenza vaccine in Mexico and the results showed the change in gene of virus avian influenza, H5N1, about 10 years after using avian influenza vaccine, which consisted of HA (H5), the component of virus vaccine. In the study there was a sub lineage found substituted the old line. The evidence of the genetic change occurred when the virus in the vaccinated chicken escaped the initial immunity in chicken and mutated a new virus, which was different

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between from the old type. Therefore, vaccine was not active to prevent the disease. This mutation process took 2 - 8 years after vaccination. The report showed that the ability of mutation of avian influenza virus in chicken was not different compared to avian influenza in human. The change in genetic code happened because of amino acid substitution at 27 points within 10 years after vaccination. The rate of mutation measured in the vaccination area was double compared to the area without vaccination. The report confirmed that vaccination stimulated virus to create mutation.

In addition, the pandemic influenza occurred in 1957 and 1968 (73) illustrated that human was a HA receptor from avian influenza. However, the report confirmed that only an amino acid (HA) has changed. After avian influenza transmitted to human, the specificity of the receptor on the cell surface in host adapted to match the virus and caused the outbreak

Avian influenza occurred in Thailand is an invasive type (HPAI) and can transmitting to human. The more the probability of virus transmits to human, the more the possibility of adaptation in human happens. The development of the virus transmitted to human might not need the intermediate host (74).

All those reasons confirmed that it is important to contribute people the helpful information for disease surveillance of avian influenza and to clean up or eliminate the virus from the environment. These processes should be done with the concern of the overall Thai people.

Study on Empowerment Education Model

Pensirinapa, N. (75) studied the effects of empowerment education on smoking prevention program of the secondary school student, Suphan-Buri province. Forty-eight student leaders were recruited from 12 classes of the experimental group, according to the set criteria, to receive the 5-day-empowerment education-training course. The student leaders were facilitated to develop necessary skills, such as communication, problem solving and group working skills, included smoking refusal skill; and to be nonsmoking activities for their friends and in the school after the train. The summary findings were the empowerment education for smoking prevention program effected significant improvement of self-esteem, smoking attitude and

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participation in nonsmoking activities, as well as prevented smoking behavior among the student leader.

Phongthai, A. (76) studied the effectiveness of the development of housewife-volunteers for improving preventive behaviors of diarrhea disease among mothers of children less than one year of age, by providing a training program for a group of selected housewives and those trained housewives organize a health education program for the group of children under one year of age. After completing of training program, each housewife-volunteer was assigned to organize health education activities for 3-5 housewives in the experimental group for improving preventive behaviors of diarrheal disease among mothers of children less than one year of age in Mueang district, Udonthani province. The results of the study revealed that after the experiment, the experimental group had perceived susceptibility, perceived severity, and perceived cost and benefits including preventive behaviors of diarrheal disease were significantly better than the comparison group.

Intarasomwang, C. (77) studied the Effectiveness of an Empowerment program on AIDS Prevention among Pregnant Women attending Antenatal Care at Pramongkutklao hospital. The sample of this study was 190 pregnant women found that the empowerment program could effect significantly increase of Knowledge, self-esteem, self-efficacy and practices in preventing AIDS among pregnant women.

Khortwong, P. (78) studied "An Application of Empowerment Theory for Improving smear-positive Pulmonary Tuberculosis Patients 'Compliance during the Intensive Phase of Treatment in Bangkok." The sample this study consisted of 113 new smear-positive pulmonary TB patients indicated that the end of the program, the experimental group showed a significant in crease in their level of knowledge about TB, self-efficacy expectation and compliance. However, there was no significant change in self-esteem in both groups.

Gomez, C. and *et. al* (79) studied "Sex in the New World: An Empowerment Model for HIV Prevention in Latin Immigrant Women." Through collaboration among scientists and providers, this study was designed to evaluate the impact of a multifaceted empowerment program for Latin immigrant women on HIV risk behaviors. Women (N=74) were followed for the first 6 months of their participation and attended up to nine distinct types of activities (e.g., information meeting,

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friendship cycles, and workshop). Although the program was not developed to specifically target HIV risk behaviors, women showed significant increases in sexual communication comfort, were less likely to maintain traditional sexual gender norms, and reported changes in decision-making power. Targeting broader socio-cultural issues may increase the necessary skills for Latin women to prevent HIV infection form their sexual partners. Successful collaborations between scientists and providers are critical in developing effective, community-relevant interventions.

In conclusion the researcher believed that the related concepts, theories and research reports could be applied to develop empowerment program on avian influenza prevention and control key community stakeholders and households representative in the study area. The key community stakeholders and households representative would show the increasing of knowledge, attitudes, practices about avian influenza, self-efficacy expectation, self-esteem, transferring of avian influenza information and the changing of avian influenza prevention and control behavior.

2.8 CONSTRUCTING OF THE STUDY CONCEPTUAL FRAMEWORK

Based on theory and information from other studies as reviewed in this chapter, the study design was divided into 2 phases; the first phase was a cross-sectional analytic study. A conceptual framework of the first phase employed for KAP survey regarding avian influenza among people in Suphan Buri province. The major variables included in the first phase were demographic variables and KAP variables (see Figure 3). For the second phase was an action research with community – based approach for prevention and control of avian flu in the community.

The literature review suggested that many attempts for community participation in avian flu prevention and control programs were less successful because the promotions for community involvement at different level of participation were unclear. The programs that said to be involved by the community actually were not truly community participation. Primary stakeholders and members of the community were not being involved in planning, implementation and managing activities of the program. Instead, the programs were designed and directed by

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government officials; the people who were participated simply did what they were told. When the support from the government ceased the programs could not be maintained.

In addition, literature reviewed helps the researcher to conceptualize and provide direction for the formulation of research conceptual framework.

First, since avian influenza problem is not solely related to bio-medical aspect but also to social, cultural, and economic as well. The effective approach in solving avian influenza problem therefore should cut across different level and various sectors. It means that bird flu prevention and control program that would be developed for the study area should be emphasized more on coordination and more collaboration among public health offices, from sub-district health office to the provincial health office. The government officers both in health sectors and other related sectors should work more closely with local authorities as well as community leaders.

Second, community-based approach is another key to success in implementing avian influenza prevention and control program. The key community stakeholders should be identified and empowered before developing and during implementing avian influenza program. The key community stakeholders should be recruited from various existing groups, which is importance and respect from their community.

Third, in order to enhance the capability of the community in dealing with their actual avian influenza problems and to make the program more sustainable, the key community stakeholders and the household representatives should learn and gain knowledge and skill through direct learning experience. That was, the empowerment activities that was designed for the key stakeholders were built around the concept of participatory learning starting from the onset in identifying their activities and community environment in relation to avian flu problem, clarification of the problem, and identification of possible solutions, project development, project implementation, and project evaluation.

Finally, since self-efficacy is one of the most predictor in performing behavioral practices, thus the perceived self-efficacy in implementing the avian influenza prevention and control activities among the household representatives were empowered.

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The key elements of this research conceptual framework were comprised of identifying key community stakeholders, empowering the stakeholders through community-based empowerment training program, and action process. And the conceptual framework of the study was shown in the following figure 3, and 4.

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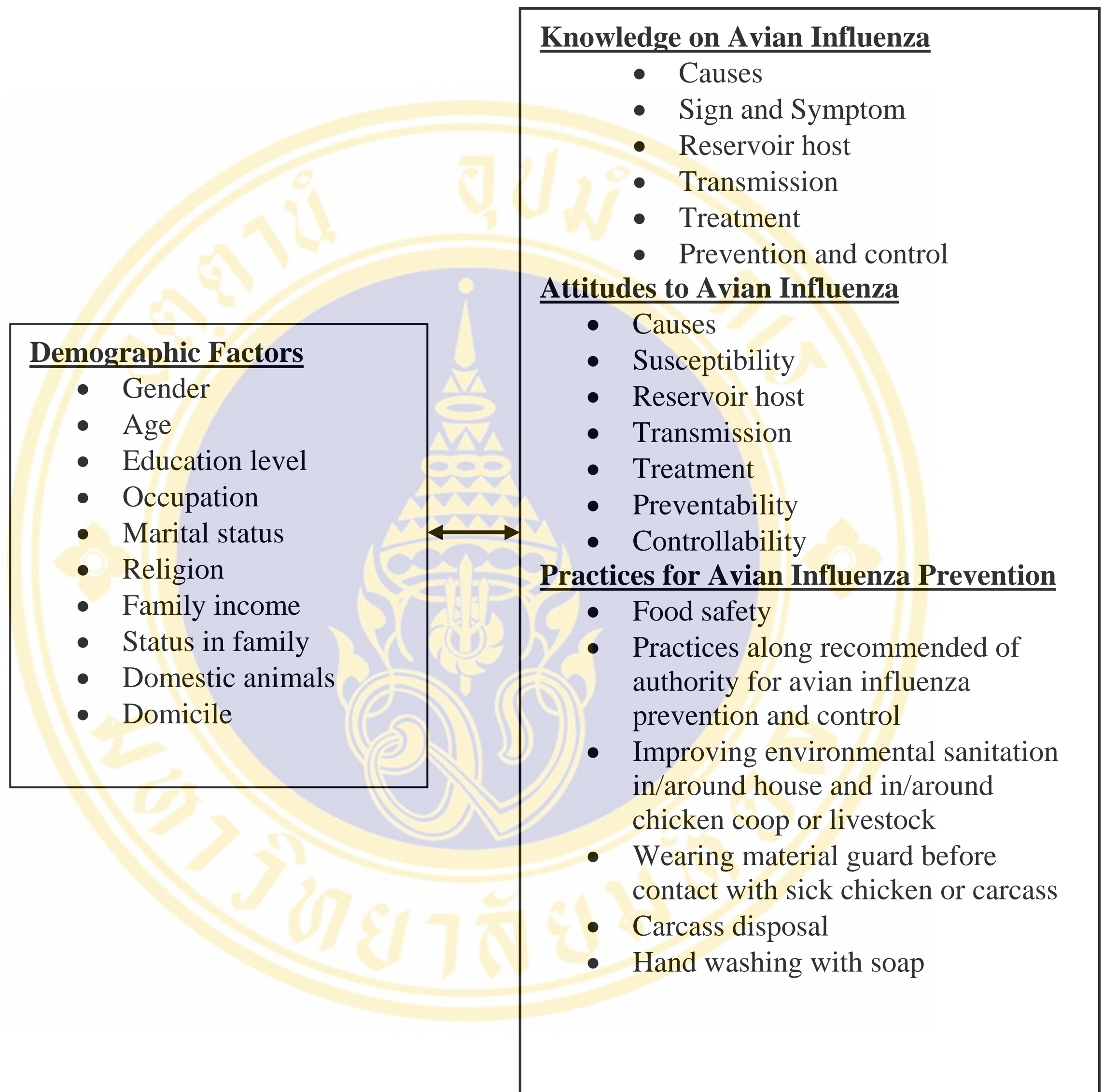

Figure 3 Conceptual Framework for KAP Survey Regarding Prevention and Control of Avian Influenza among People in Song Phi Nong District, Suphan Buri Province

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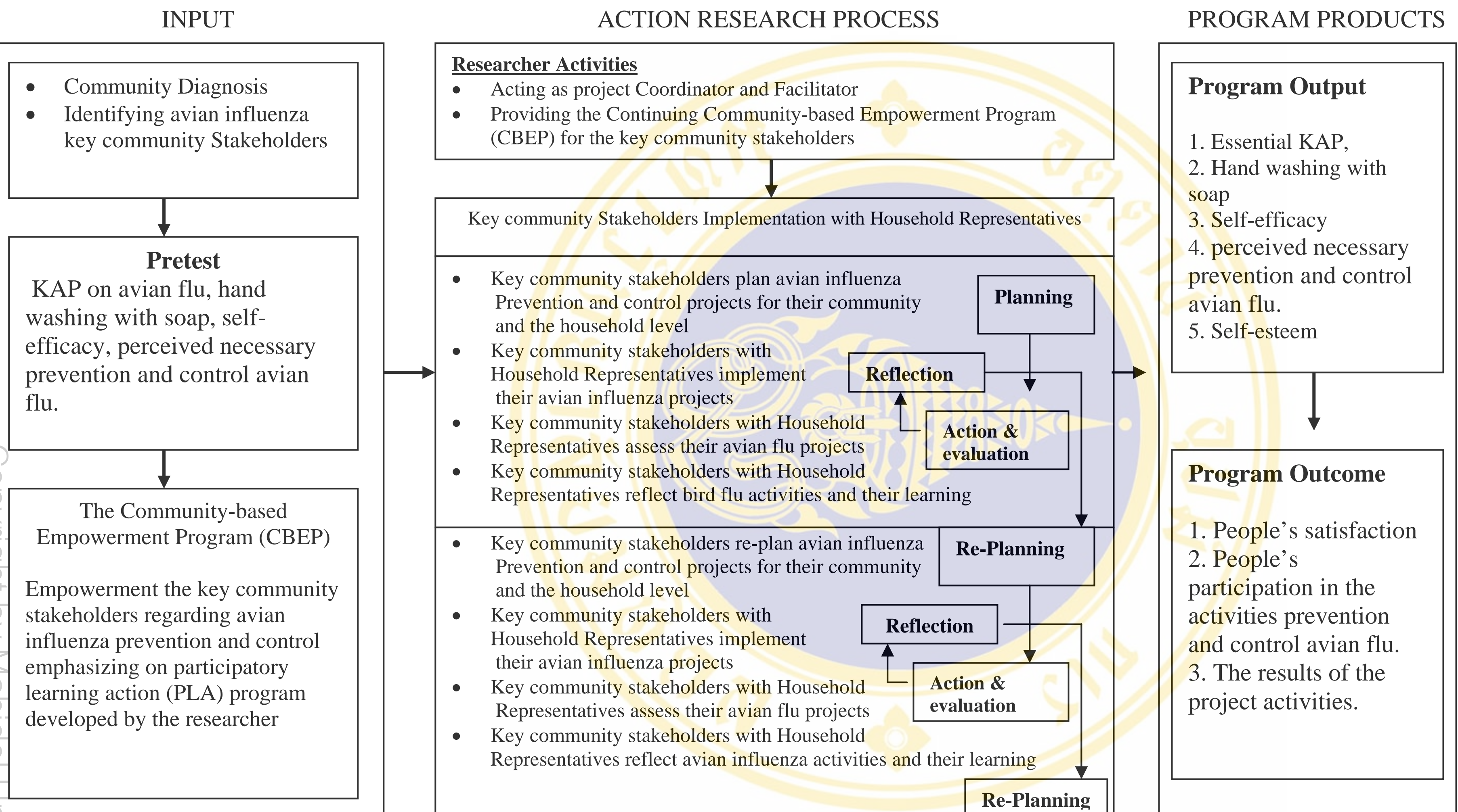

Figure 4 Conceptual Framework of the Community-Based Approach for Prevention and Control of Avian Influenza

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CHAPTER III

METHODOLOGY

The designs for this study were two types; the first was a cross-sectional analytic study and the second was an action research. According to the objectives of the study, two study phases were proposed. The study design and methodology of each study phase were planned separately. Different sets of population and samples were involved in accordance with each study objective.

3.1 PHASE 1: KAP Survey Regarding Prevention and Control of Avian Influenza Among People in Song Phi Nong district, Suphan Buri Province

3.1.1 Study Design

A cross-sectional study design was conducted to access knowledge, attitudes and practices regarding prevention and control of avian influenza.

3.1.2 Study Site

This study was conducted in almost all sub-districts in Song Phi Nong district, Suphan Buri Province, where is approximately 80 kilometers Northwest of Bangkok. The district is located in the most southern part of the province. Song Phi Nong is divided into 15 sub-districts, in which two of the sub-districts are municipalities and urban settings. In 2005, the district had its total population of 116,722, of which there were 54,757 males and 61,965 females. Fourteen of the 15 sub-districts were selected as research sites because they represented the range of variation in raising poultry, and used to be an epidemic area of avian influenza among poultry that transmitted to human in the year 2004, and affected socioeconomic status of communities in the

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district. However, populations were quite large to be carried out through the total number in 140 villages. Then, using the multi-stage random sampling technique could obtain a number of population samples to represent the total population. The study recruited 782 individuals from 14 sub-districts, one sub-district of the urbanized setting was excluded from the study.

3.1.3 Population and Sample Size

The total population was 116,722 people and 24,086 households living in Song Phi Nong district, Suphan Buri as shown in Table 4.

Inclusion criteria for study samples are as follows.

1. Both males and females aged 15 - 65 years old.
2. Living in the community more than six months.
3. Willing to join the study and to sign in the informed consent form.

Exclusion criteria are listed as follows:

1. Both males and females aged less than 15 and over 65 years old.
2. Living in the community less than six months.

The sample size of population was calculated from the following formula (80).

$$n = \frac{Z^2_{1-\alpha/2} \, P \, (1 - P)}{d^2}$$

Where

n = the desired sample size

$Z_{a/2}$ = the standard score corresponding to a given confidence level, with a 95 % confidence level, Z = 1.96

P = the proportion of 2,769 households that raise native chicken in house of Song Phi Nong district, Suphan Buri = 11.61% (81)

1 – P = 1- 0.116 = 0.884

d = εP (0.2 x 0.116) = 0.023

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ε (Relative error) = We allowed an error, here set at 20 %, then the degree of accuracy = 0.2

In order to study KAP of households with or without poultry farm, reported proportion of household with raised poultry was used as a baseline for sample size calculation. The provincial data reported p = 11.61%.

When replaced into the formula, then:

$$n = \frac{1.96^2 \times 0.116 \times 0.884}{0.023^2}$$

$$= 745$$

The sample size was 745. After adjusted for 5 % for missing data, the actual sample size became 782

Taking the population in each sub-district into an equation as below, the sub-samples by sub districts were calculated:

$$\frac{\textbf{Households raising native chicken X sample size (782)}}{\textbf{All households raising native chicken in Song Phi Nong District (2,796)}}$$

Proportions of samples by sub-districts are listed as shown in Table 4.

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Table 4 Number of houses sampled by sub-districts in Song Phi Nong District, Suphan Buri Province.

No.	Name of the sub-districts	Number of households	Households raising native chicken		Sample size
			Number	%	
1	Bang Len	1,414	164	12.60	45
2	Bang Ta-Tain	3,400	395	11.61	110
3	Bang Ta-Kian	1,157	134	11.61	38
4	Ban Kum	788	92	11.67	26
5	Hua Phoe	2,183	253	11.59	71
6	Bang Phlab	974	113	11.60	32
7	Noen Phra Prang	944	110	11.61	31
8	Ban Chang	755	88	11.61	25
9	Ton Tan	784	91	11.61	26
10	Sri Samran	2,005	233	8.32	65
11	Thung Khok	3,431	398	11.61	111
12	Hnong Bo	1,492	173	11.60	48
13	Bo Suphan	3,762	437	11.61	122
14	Don Manao	997	115	11.61	32
	Total	**24,086**	**2,796**	**11.61**	**782**

3.1.4 Sampling of Samples (Random of House Samples)

According to the sample size of each sub-district in Song Phi Nong district, therefore, the samples was proportionally selected from each sub-district to represent the total households from 140 villages, which was shown in Figure 5. A multi-stage sampling technique was performed. Observation technique was used to obtain data from selected 30 % of all villages in each sub-district by means of simple random

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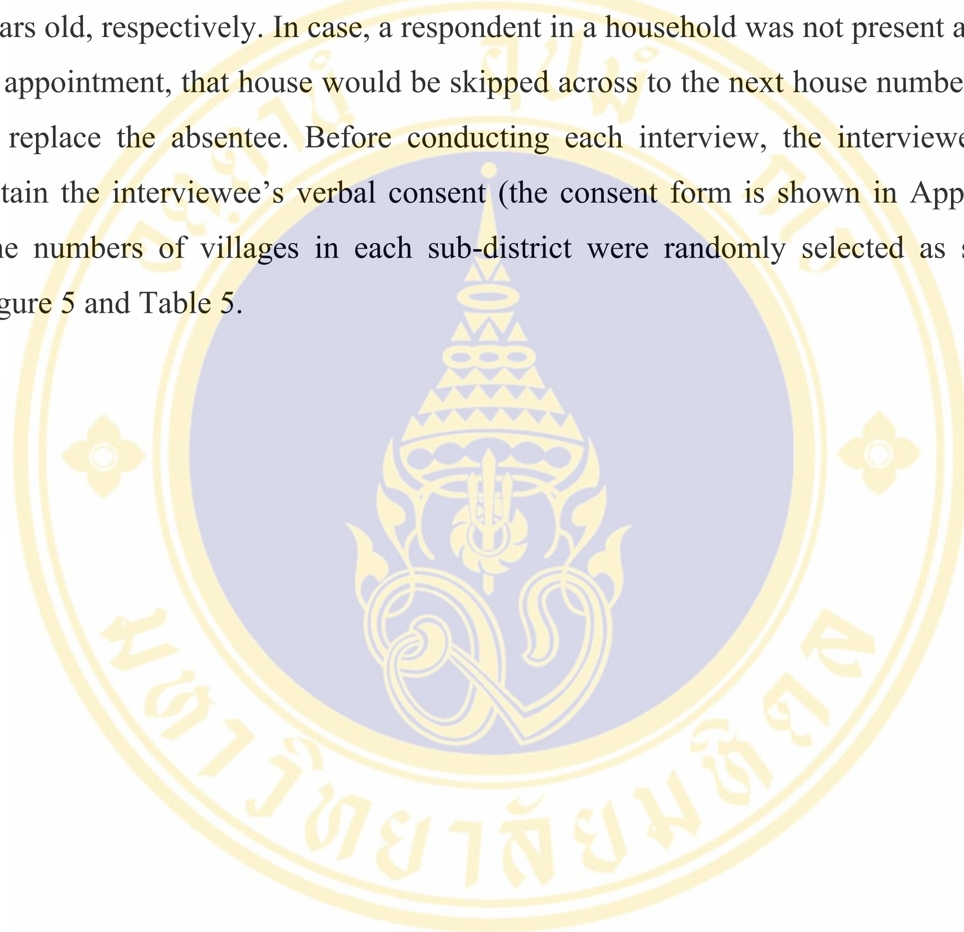
sampling. People of each village were randomly selected for interview by means of simple random sampling from the village census. The eligible person who was a representative of household was asked to participate and to be interviewed. The process of interview was assigned prior to the head of household. If he/she were not home, the interview would be going to a spouse or other person aged between 15 - 65 years old, respectively. In case, a respondent in a household was not present at the date of appointment, that house would be skipped across to the next house number in order to replace the absentee. Before conducting each interview, the interviewer had to obtain the interviewee’s verbal consent (the consent form is shown in Appendix F). The numbers of villages in each sub-district were randomly selected as shown in Figure 5 and Table 5.



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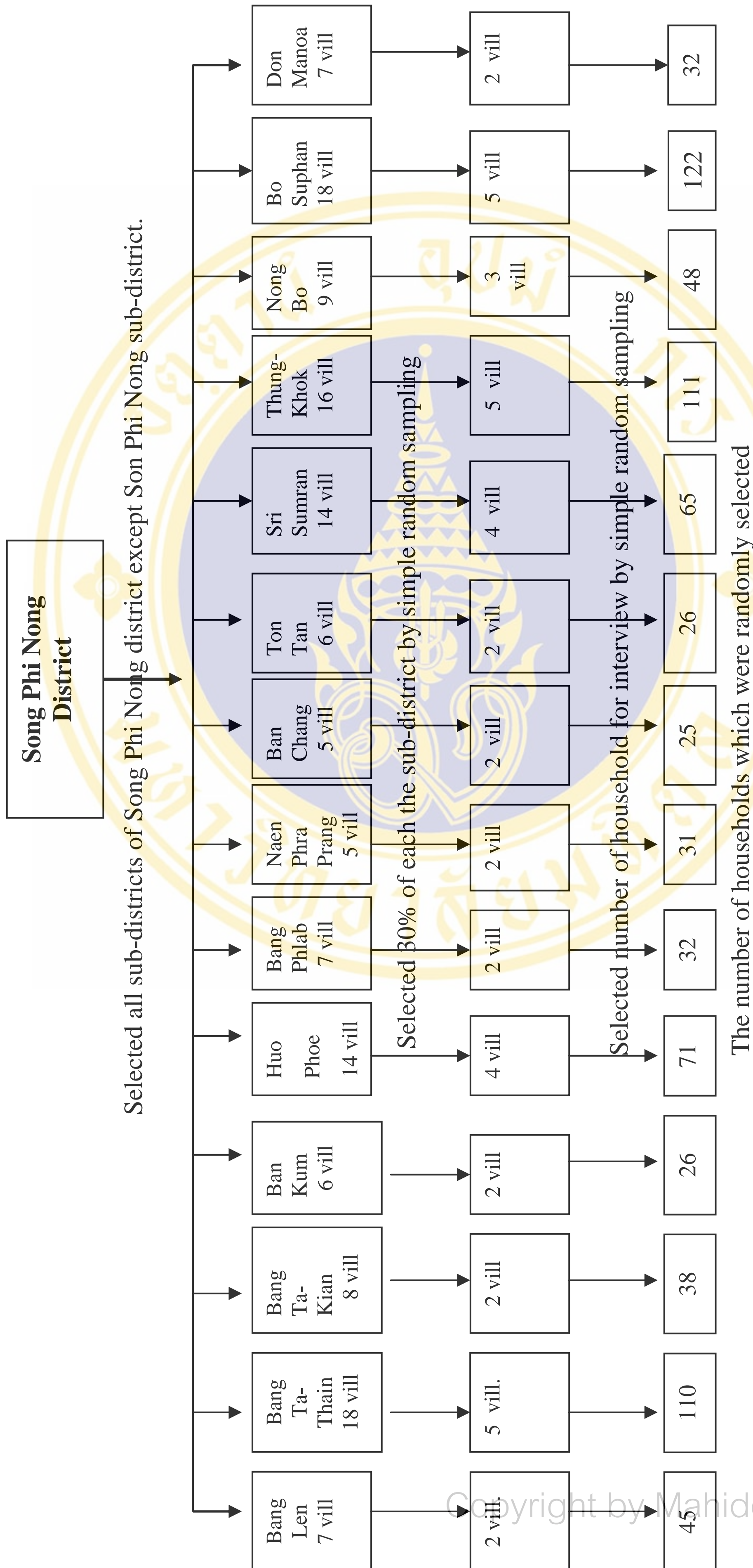

Figure 5 Procedure for Multi-stage Random Sampling

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Table 5 The Sub-Districts and Villages were Randomly Selected for Interview

No.	Sub-districts	Sample Size (Population samples)	Total Villages	Selected 30% of all Villages	The sample size in each village
1	Bang Laen	45	7	2	45/2 = 23
2	Bang Ta-Tain	110	18	5	110/5 = 22
3	Bang Ta-Kian	38	8	2	38/2 = 19
4	Ban Kum	26	6	2	26/2 = 13
5	Hua Phoe	71	14	4	71/4 = 18
6	Bang Phalab	32	7	2	32/2 = 16
7	Naon Phra Prang	31	5	2	31/2 = 16
8	Ban Chang	25	5	2	25/2 = 13
9	Taon Tan	26	6	2	26/2 = 13
10	Sri Samran	65	14	4	65/4 = 16
11	Thung -Khok	111	16	5	111/5 = 22
12	Nong Bo	48	9	3	48/3 = 16
13	Bo Suphan	122	18	5	122/5 = 24
14	Don Manoas	32	7	2	32/2 = 16
	Total	782	140	42	

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The samples recruited into this study were 782 people in Song Phi Nong district. However, two additional respondents were made, the actual number of samples was rounded up to 784.

3.1.5 Study Variables

Demographic data included personal characteristics: sex, age, educational level, religion, marital status, family income, received information about avian influenza and etc. Key outcome of interest included knowledge, attitudes, and practices on the prevention and control of avian influenza.

3.1.6 Research Instruments

The research instrument used in phase 1 was a structured questionnaire. This interview schedule consisted of 2 parts as follow:

Part 1 Socio-demographic data: This part comprised questions concerning age, sex, marital status, education, occupation, family income, religion, domestic animals etc. The questionnaire included both closed-ended and open-ended questions.

Part 2 The psychosocial factors included knowledge, attitudes, and practices on avian influenza and practice behaviors about hand washing with soap and using mask: This part contained questions about the disease causative agent, signs and symptoms, mode of transmission, prevention, control, treatment, hand washing with soap and use of protective guards.

The structured questionnaire of knowledge about avian influenza

The knowledge questions consisted of 18 items. A correct answer received a score equal to 1. A wrong answer or uncertain response received 0 score, which means the respondent did not know about that question. The levels of knowledge on avian influenza were grouped into 3 levels (82) by a criterion as follows:

0 – 6 scores categorized as a low knowledge level.

7 – 12 scores categorized as a moderate knowledge level.

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13 – 18 scores categorized as a high knowledge level.

The structured questionnaire of attitudes toward avian influenza

Attitudes toward avian influenza consisted of 17 items, with the total 51 scores. The scoring method was applied from a Likert Scale there were 3 choices for each item. All items were positive. The scoring for each scale was given as following:

Positive Attitude	Agreed	3 points
	Not sure	2 points
	Disagreed	1 point

The levels of attitudes toward avian influenza were grouped into 3 levels by a criterion as follows:

1-17 scores categorized as negative attitudes.

18-34 scores categorized as not sure.

35-51 scores categorized as positive attitudes.

However, an assessment of associations between socio-demographic variables and levels of attitudes were calculated by the chi-square test in the first phase. The attitudes regarding avian influenza were divided into 2 levels as follows:

Negative attitudes were scored from less than 70 % (1-34 points).

Positive attitudes were scored from 70 % up (35-51 points).

The structured questionnaires of practices of avian influenza prevention and control

Practices toward preventive avian influenza consisted of 15 items, and total 30 scores. The scoring method was applied from Likert Scale, 3 choices for each item, all items were positive, scoring method were:

Positive Statement	All time	2 points
	Sometimes	1 point
	No practice	0 point

The levels of practices toward avian influenza were grouped into 3 levels by a criterion as follows:

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< 10 scores categorized as a low practice level.

10-20 scores categorized as a moderate practice level.

21-30 scores categorized as a high practice level

The structured questionnaires of practice behaviors about hand washing with soap

The structured questionnaire toward behaviors of hand washing with soap consisted of 11 items. There were 3 categories for each item, the scoring were assigned as follows:

Application	No application	0 point
	Yes	1 point
Frequency of hand washing	No practice	0 point
	Sometimes	1 point
	Regularly	2 points
Method of hand washing	Water	1 point
	Soap	2 points

Steps of developing the instrument

1) Review concepts, theories, related research about avian influenza and results from the preliminary study.
2) Construct the interview schedule, framework according to the study objectives, and conceptual framework.
3) Design the questions.
4) Assess content and construct validity by the thesis advisers 3 persons and experts, and then revision was made according to the expert's suggestions.
5) All research instruments were tested for their content validity and reliability. The alpha Cronbach approach was used to assess the reliability of the sum of all items and each item. The results from the alpha analysis were used to improve and to adjust for the questionnaire items.

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3.1.7 Questionnaire Development

After a first draft of the questionnaire was constructed (Appendix D). Then, the adviser and the thesis committee members were consulted to assess for its content validity prior to try out. The first draft of questionnaire was pre-tested for 50 samples from community members in a village in Suphan Buri that was similar to the study area.

The Cronbach's alpha coefficient method was employed to assess reliability of the data parts 1, and 2. These were knowledge, attitudes and practices of avian influenza prevention and control. Then, the high-low 27 percent group method (83) of knowledge item analysis was used to examine the power of item discrimination. The items found a low or non of discriminatory power that would be eliminated from the questionnaire, and some would be revised for their wordings. Finally, the revised questionnaire was reorganized.

Validity and Reliability of the Questionnaire

After the first draft of data collection instruments were constructed, they were assessed by thesis advisers for contents and constructed validity. After improved, only the questionnaires for interviewing with household representatives were tested for its reliability with 50 randomly selected household members in a community that was similar to the study area.

The Cronbach's alpha coefficient method (84) was employed to assess reliability of the data parts 1 and 2. These were KAP of avian influenza prevention and control. It was found that the reliability of KAP test was 0.8. The high-low 27 percent group method (83) of knowledge item analysis was used to test for the discriminatory power of each question. Items found with too low or too high power (<0.2 or >0.8) were revised, if they did not affect the validity of the instrument; otherwise, they would be excluded.

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3.1.8 Data Collection

The researcher and five interviewers together conducted the collection of data. The interviewers were recruited from people who finished at least high school and were able to work for two months in the field. The researcher performed one day training for five interviewers and three field supervisors. The training content was included topics about respectfulness to the right of the data providers, qualification of interviewers, general knowledge about avian influenza, the interview method, process, and data collection. Interviewers conducted interviews with 784 respondents who lived in 42 villages of Song Phi Nong district, of which two villages were in the urban (municipality), and 40 in the rural. In average, one interviewer could interview eight respondents per day. After completion of the interview each time, the interviewer handed the questionnaire back to the supervisor to check out. Completed questionnaires were sent to the researcher to make the data entry.

3.1.9 Data Analysis

The data was analyzed by the STATA software program and was presented in the following manners.

1. Descriptive statistics, such as mean, standard deviation, frequency and percent distribution were employed to describe socio-demographic characteristics of the study population.

2. Chi-square test was used to examine relationships between socio-demographic characteristics and knowledge, attitudes and practices toward avian influenza.

3.2 PHASE 2: Action Research Process and Implementation

3.2.1 Study Design

The research design for the second phase was one group pretest-posttest action research, conducted in a selected community. Both quantitative and qualitative data were collected before, after, and during the implementation.

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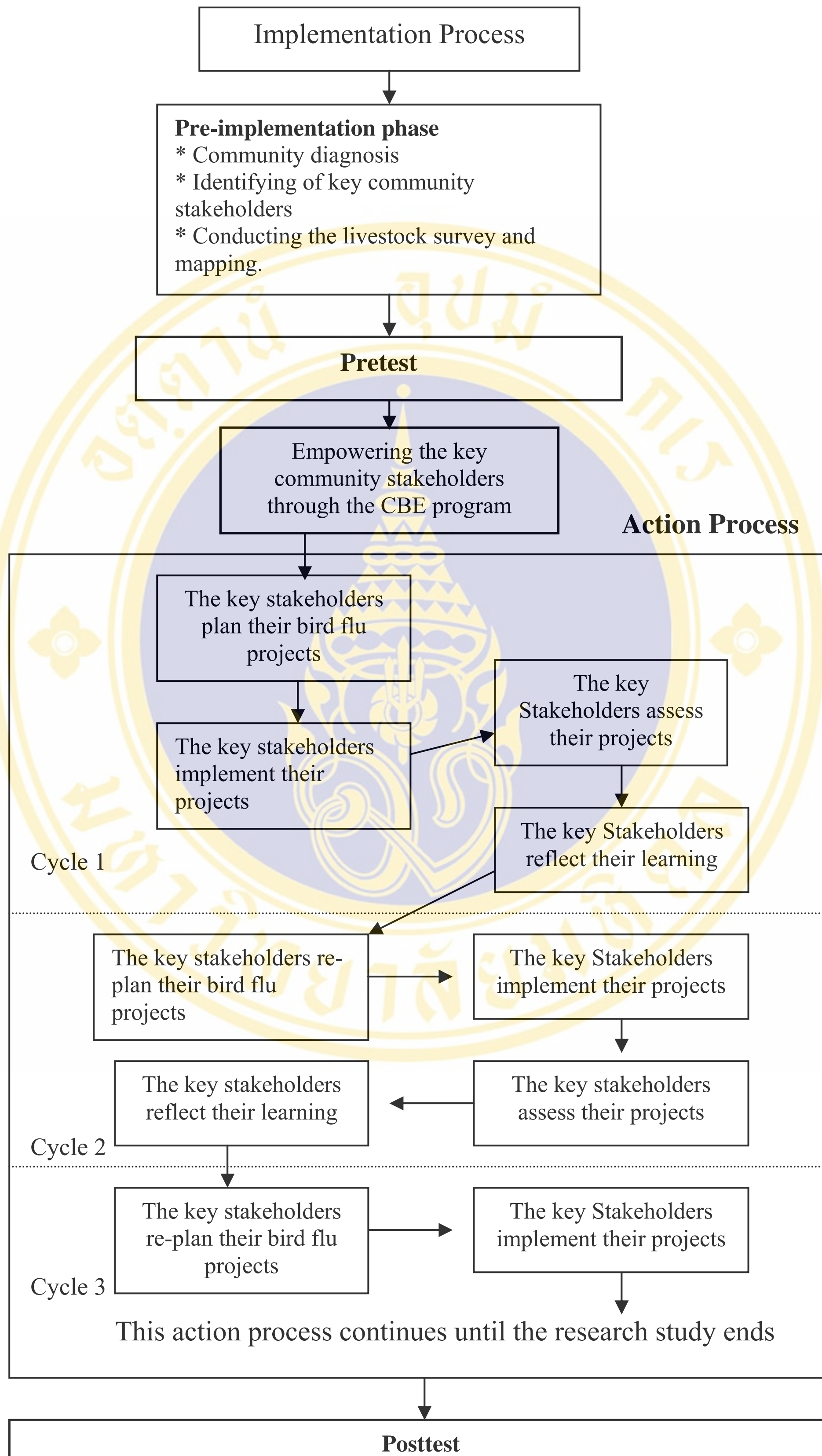

Figure 6 Implementation Processes

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3.2.2 Study Site

The study was carried out in Ban Vang Ta-ku, Song Phi Nong District. It was an action research that the researcher developed a community-based empowerment program for the implementation regarding prevention and control of avian influenza; therefore, the study site was purposively selected as the following steps.

1) One district of Suphan Buri province where avian influenza attacked human cases in the year 2004 and had reported of H5N1 virus infection in poultry.

2) Since the study could not be done for the whole district, therefore, one village in sub-district that had avian influenza incidence (with confirmed cases) in 2004 was purposively selected as a study area.

The health statistic report by Suphan Buri Provincial Health Office in 2004 showed that Song-Phi-Nong district had an incidence case of avian influenza (one confirmed patient and died) in Thung-Khok sub-district.

Thung-Khok Sub-district is about 15 kilometers from Song–Phi–Nong District Health Office. In 2004, the sub-district comprised 16 villages. Among those, village No. 8, namely, Ban Vang-Ta-ku, with 199 households was purposively selected as the implementation where that confirmed case of avian influenza died in February, 2004.

3.2.3 Population and Sample

Population: The action research took place in the village No. 8 (Ban Vang Ta-Ku), where all 1,140 persons accounted to be subjects in the village who were susceptible to avian influenza study population. The populations of this study village were divided in two groups as follows:

3.2.3.1 Key Community Stakeholders, who were recruited for developing, implementing, and monitoring of the avian influenza prevention and control program at the community level.

As mentioned in Chapter 2 that community participation could contribute

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greatly to the effectiveness and efficiency of a program. For this reason it is important to identify *key stakeholders* or *key representatives and groups within the affected population.* It might not be possible for each and every member of the affected population to contribute to a program equally; however, attempts could be made to identify key groups and individuals that could be actively involved so called "key community stakeholders." In this case individuals that could potentially affect or be affected by the avian influenza prevention and control program were identified.

The key community stakeholders of this study were divided into two groups as follows:

1) Key community stakeholders were individuals or an existing group from the affected community members namely village health volunteers, village headman, village headman assistants, committee members of village, members of housewife group, members of village security group, members of council Tambon Administrative Organization (TAO), and Technology Transfer Leadership of Thung-Khok sub-district.

2) Facilitative stakeholders were three persons who had authorities Namely health worker from Thung Khok sub-district health center, Ban Long Tong Health Centre one person, and Song Phi Nong district health office two persons.

Recruitment of the Key Community Stakeholders

The research and village headmen cooperated to set the number of key community stakeholders who should participate in this project. The procedures to recruit key community stakeholders were as follows.

1. Village health volunteers in the community are persons assigned proportionally that one village health volunteer serves 10-15 households. Therefore, village health volunteers and community social sub-group representatives were recruited including a village headman identified key community stakeholders. Their recruitment started with on interview with the village headman who took an important role in the village. The community as well as the community members who were actively involved in the community activities interviewed him regarding the avian influenza prevention and control performance. He was asked to give recommendation

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to select two or three key community stakeholders. The recommended key community stakeholders were then interviewed and asked to suggest another two or three persons and until the researcher obtained targeted 24 key community stakeholders.

2. The second group of facilitative stakeholders we recruited one officer from Song Phi Nong District Livestock Office, three health workers from Thung Khok sub-district health centre, one health worker from Ban Long Tong health centre, and two health workers from Song Phi Nong District Health Office. Therefore, key community stakeholders and facilitative stakeholders were totally 31 persons recruited into this study.

3.2.3.2 Household Representatives

The second group of the study samples was household representatives of Vang Ta-Ku village. They mainly involved in planning and implementing the avian influenza prevention and control project activities at the household level specifically in improving environmental sanitation and cleaning livestock farmhouses. We had 199 households in Vang Ta-Ku village where one house representative was nominated to join this study under a criterion of:

1) Either males or females aged between 15 and 65 years.
2) Be selected by his or her household members to perform avian influenza prevention and control project activities.
3) Do not have any intension to move out from the village during 6 months of the study.
4) Willing to join the project.

One-exclusion criteria: was that the household representatives should not be replicated the key stakeholder. It yes, we excluded them from the list.

3.2.4 The Action Research Process and Implementation

The research intervention activities of this study were divided in to two major phases, pre-implementation and implementation.

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3.2.4.1 Pre-implementation Phase

This phase comprised three basic activities, gathering of baseline data about the study village, identifying key community stakeholders, and conducting the village survey regarding avian influenza. The implementation phase emphasized mainly on empowering the key community stakeholders to carry out avian influenza prevention and control program and to monitor the project. The facilitative stakeholders provided social supports as well as technical assistance for the key community stakeholders.

1) Gathering of Baseline Data about the Study Village.

Baseline data about the structure of the study village and their information in relation to avian influenza prevention and control was gathered prior to identifying the key community stakeholders. The following information were assessed:- present community structure, environmental condition regarding raising the poultry, socio-cultural and economic status of the community, community activities in prevention and control practices emphasized on carcass eradication, health care services and traditional practices commonly found in the community. Information about avian influenza prevention and control program of sub-district health center and from Tambon Administrative Organization (TAO) was also gathered. This information was mainly used for sharing and exchanging information with the key community stakeholders during the participatory learning action (PLA) process.

2) Identifying the Key Community Stakeholders.

The key community stakeholders and the facilitative stakeholders were identified as mentioned above. However, the key community stakeholders and household representatives of the study village were the priority group to cope with. After the key stakeholders were identified, they were categorized according to the type of participation at different stages of the avian influenza prevention and control activities by the action plan. At the planning, implementing, monitoring, and

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evaluating the project, the key community stakeholders fully participated and involved in this study.

3) Conducting the Village Survey Regarding the Avian Influenza

Before conducting the village survey, the village map was drawn on the basis of existing map of Ban Long Tong Health Center. Community map was a useful tool for collecting information from the community concerning the location of avian influenza prevention and control activities. The technique so called "Transect-Walk" was used for drawing the map. Location of housing, area of cultural, household that raised animals, and road, were appeared on the map.

After the community map was drawn, the village survey was conducted mainly at the household level since the household was the focal point in the control of risk factors relating to avian influenza. It was also the focal point of the study intervention. The information from the survey was used as baseline data for the following steps and for the pre-testing data as well.

3.2.4.2 Implementation Phase: Action Research Process

1) Training the Key Community Stakeholders

Researcher and staffs trained 24 key community stakeholders who were village headman, village headman assistants, committee members of the village, members of the housewife group, members of the village security group, members of council Tambon Administrative Organization (TAO), and Technology Transfer Leadership of Thung-Khok Sub-district. Objective of the training was to enhance ability of the key community stakeholders. The training was performed two times. The first training was conducted on June 29, 2005. The contents of the first training included general situation and knowledge of avian influenza, role and responsibilities of themselves to prevent and control avian influenza in the study village. After one week from the first training, they returned to their home in order to find out the data and strategy for

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applying to write the avian influenza prevention and control plan in the second training. The second training was performed on July 8, 2005 (later one week after the first training). The data feedbacks were applied to write the plan of avian influenza prevention and control for the study village. The knowledge about the avian influenza and the experiences received from the two trainings. These were applied to write the action plan of avian influenza prevention and control. After finished the second training, the action plan was led to promptly action in the study village and it was submitted to the government official at the same time. This plan submitted because of we required financial support from the concerned governmental units.

2) Role of the Key Community Stakeholders for Implementation of Prevention and Control of Avian Influenza in the Study Village

The results from the first training, key community stakeholders, facilitative stakeholders, and researcher had mutually summarized the role of the key communities to perform the prevention and control of avian influenza as follows.

1. Surveillance and reported occurrence of the avian influenza both in poultry and in human, in case with illness or dead poultry with an unknown cause. These must be reported to health workers and properly educated people regarding prevention and control of avian influenza, including proper elimination of animal carcasses.

2. Providing knowledge about avian influenza and motivating people to participate in activities of avian influenza prevention for their zone (8-10 households) such as spraying the anti-infective virus solution, cleaning the cages/coops, and destroying germ contaminated places around the house.

3. During the outbreak of avian influenza, the key communities must provide personal protective materials such as gloves, mask for the risk group or individual, and sprayed anti-infective virus solution in poultry cages/coops.

4. Scaling up knowledge of avian influenza during the religion rites namely Buddist's Lent days (Khoa-Phansa, Auk-Phansa) and other ritual festivals in order to create awareness and conscious for disease prevention in humans.

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5. Conducting the meeting of villagers in the study village (Pra-cha-Khom Mooban) to mobilize all people to find out methods of avian influenza prevention and control in the village, and to develop the plan of the village that required funding from the government supports.

6. Taking the action plan of avian influenza of the village that also required funding.

7. The key community stakeholders had a meeting every fifth day of the month in order to exchange information and share experiences among the groups.

3) Projects Implementation, Monitoring, and Evaluation by the Key Community Stakeholders

The second training, the researcher and facilitators provided description and demonstration in the lecture, group discussion, brainstorming and practices in the training process. These processes could help the key community stakeholders to write the action plan of avian influenza prevention and control. The plan operated in Vang Ta-Ku village from July to November 2005, as following activities:

1. Assigned the key community member to responsible 8-10 households for the surveillance program whenever the disease would be spread in humans and in poultry.

2. The key community members educated people in their zone, performed the surveillance, and reported any occurrence of avian influenza whether in poultry and in human every month by the provided form.

3. Conducted the key community members meeting every 5th day of the month to provide education to people, and followed up the progress of conducting avian influenza prevention of the key communities and the problem solution or trouble in all conducted activities.

4. The key community members met the villagers three times for the health education campaign about avian influenza and promoted cooperation from all people to clean their houses, environment, and also cages/coops on every Friday. The

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slaughters, farmers who raised native (domestic) chicken, farming ducks (free-range duck raising; Phed Lai Thung), and fighting roosters were advised to wear gloves and mask all times when contacted the fowl. They could obtain the gloves and masks from the health worker at Ban Long Tong Health Centre.

5. Between October and November 2005, avian influenza attacked poultry at neighboring villages and was spread to Vang Ta-Ku village. The key community members conducted the meeting with all villages twice to give education about avian influenza and the prevention. This process aimed to reduce the transmission of the disease to poultry and to human. The key community members collaborated with Song Phi Nong Livestock Office and requested an antiseptic spray for people who raised poultry in the village. Those people sprayed the antiseptic solution to cover the cages/coops and around their houses every three days until the outbreak declined. During the outbreak of the disease, duck farmers were not allowed to keep their flocks in the rice field according to prevent viral spread in the environment. Meanwhile, health workers from Ban Long Tong Health Centre supplied masks and gloves to all people who raised poultry.

6. During October 5, – November 5, 2005, the outbreak of avian influenza widely spread among poultry in Suphan Buri province. The governor allocated the budget to purchase anti-septic solution to control H5N1 viruses in the areas. The key community members and farmers were assigned to promptly spray anti-septic in the cages/coops and around their houses during November 1 – 3, 2005.

7. After the end of the research project, researcher met the key community members, and the villagers to feedback the results. In the meeting, researcher delegated ceremony to appreciate the health workers from Ban Long Tong Health Centre who were responsible to the village and the members of the council of Thung Khok Sub-district Administration Organization who provided supports for the key community members continuously and also for other activities in the community.

4) The Model of Prevention and Control of Avian Influenza in the Study Village

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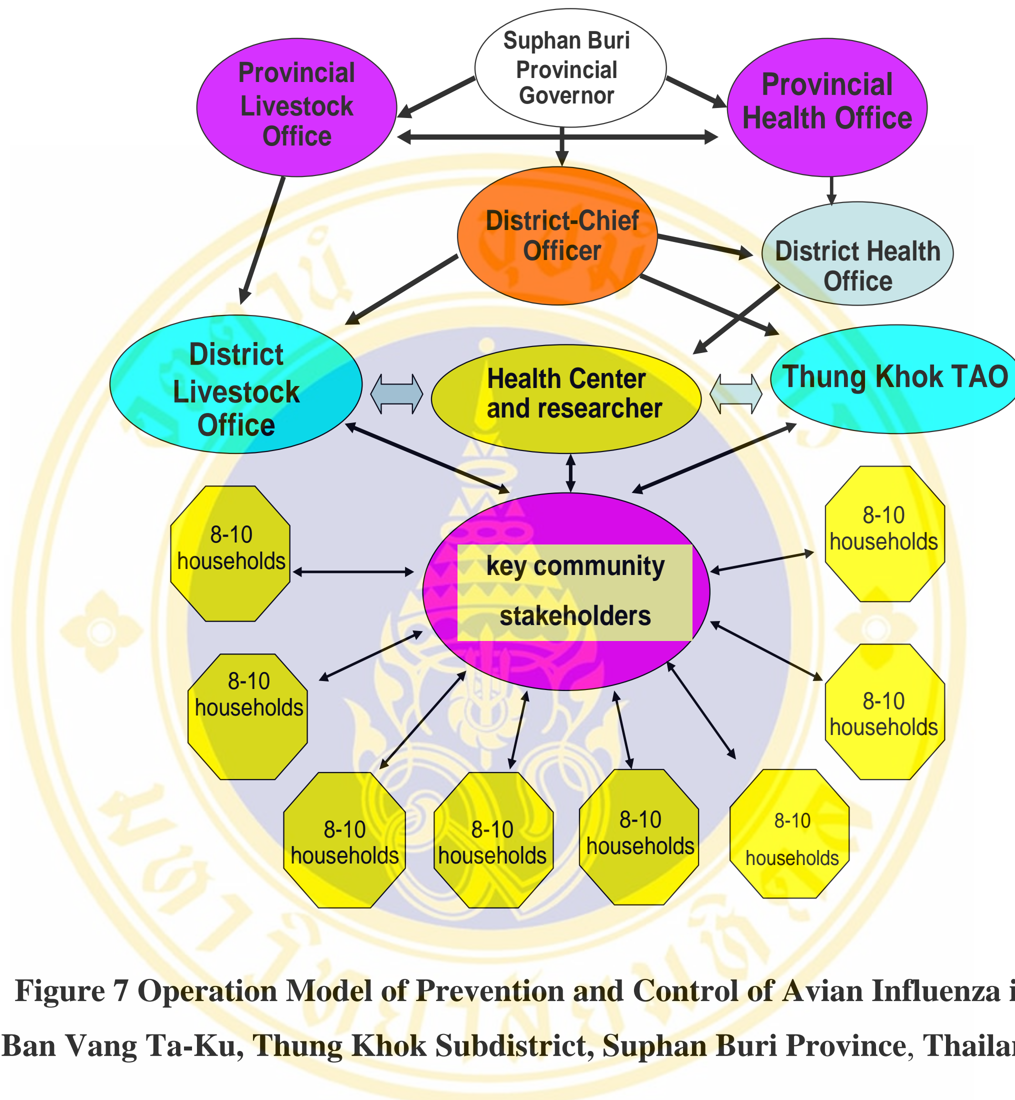

Figure 7 Operation Model of Prevention and Control of Avian Influenza in Ban Vang Ta-Ku, Thung Khok Subdistrict, Suphan Buri Province, Thailand

After the training, 24 key community stakeholders were assigned for a responsibility zone. One key community member was responsible for 8-10 households. They operated as follows.

1. Performing surveillance and reporting occurrence of avian influenza both in poultry and in human cases numbering illness or death of poultry whether known or unknown cause. Results of surveillance must be reported to the health workers and properly educated their people regarding prevention and control of avian influenza, and including proper elimination of carcass.

2. Educating people in their responsible zone, and campaigning the

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knowledge of avian influenza in every people gathering in order to create awareness and consciousness of disease prevention in humans.

3. Conducting the meeting every fifth day of the month to exchange information, learn experiences among groups, consecutively, and following up the progress of implemented avian influenza prevention, problem solution or struggles in all conducted activities.

4. Distributing mask, gloves, and anti-septic spray to the people who raised domestic poultry.

5. Spraying antiseptic in poultry barns of the people who raised domestic poultry during the outbreak of avian influenza.

The personal protective materials such as mask and gloves had to be supported from Ban Long Tong Health Center. The antiseptic solution need support from Song Phi Nong District Livestock Office and Thung Khok Sub-district Administration Organization. Whereas, the provincial governor allocated the budget for the anti-septic solution, and personal protective materials to distribute to people who raised poultry in the outbreak areas. The budgets were subsidized to Provincial Livestock Office, Provincial Health Office, District-Chief Officer, District Livestock Office, Tambon Administration Organization, District Health Office and Health Center. In the village level, key community stakeholders received support for mask, gloves, and anti-septic solution from the Health Center, District Livestock Office, and Tambon Administrative Organization. However, the three agencies collaborated in prevention and control of avian influenza for the exchange information, and supported the materials to the key community stakeholders.

Measurement of the program: The program effectiveness was assessed mainly through the following indicators:

The program outputs were assessed by increased KAP of avian influenza, self-efficacy, self-esteem, and perceived necessary to prevention and control of the disease.

Finally, the program lasted about 6 months, people's satisfaction in the project activities, people's participation in the project activities, advantages of the project activities and outcomes or benefits of the project affecting the community were

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used to assess the program outcomes. The following flow chart presents schedules of the CBEP and data collection during the study period (see Appendix B).

3.2.5 Research Instruments

The research instrument comprised 3 types:

1. The structured questionnaire for the pre-tested implementation program: The questionnaire had 3 parts as follows:

Part 1 Socio – demographic data: This part comprised questions of age, sex, marital status, education, occupation, family income, religion, etc. The questionnaire was mainly designed for closed-ended and open-ended questions.

Part 2 Knowledge, attitudes, practices on avian influenza and the hand washing methods: This part contained items that comprised questions about the disease cause, signs and symptoms, mode of transmission, prevention, control, treatment, and hand washing methods. The scoring and category of KAP toward avian influenza was similar to that of the phase I, on pages 87-89.

Part 3 Self-efficacy and necessity to prevent and control of avian influenza: The questions in this part were related to the perception of self-efficacy and outcome expectation regarding prevention and control practices of avian influenza. The Likert scale technique was used for this measurement.

Self-efficacy and necessity to prevent and control of avian influenza consisted of 21 items, with the total of 42 scores in the self-efficacy questions. However the necessity to that prevention and control of avian influenza statements had total 63 scores. The scoring method was, applied from Likert Scale, consisting of three-scale item in each. The scoring of self-efficacy question was assigned as following:

Do well	2 points
Not sure	1 points
Not do	0 point

The level of self-efficacy to prevent and control of avian influenza was grouped into 3 levels by criteria as follow:

< 14 scores categorized as “not done.”

14-28 scores categorized as “not sure.”

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> 28 scores categorized as "done well."

The scoring of necessity to prevent and control of the disease question was as the following:

Very many	3 points
Moderate	2 points
Less	1-point

The level of necessity to prevent and control of avian influenza was grouped into 3 levels by criteria as follow:

1-21 scores means the activity was less necessary.

22-42 scores means the activity was moderate necessary

43-63 scores means the activity was very necessary.

2. An empowerment program for key community stakeholders included 2 phases as follows:

1.1 Phase I: Orientation of the problems and planning for the program implementation

1.2 Phase II: Presentation of planning and program improvement

3. The key community stakeholders performed the following action plan of avian influenza prevention and control in the study village.

Performing activities to prevent and control of avian influenza in the community, the key community stakeholders were assessed themselves by filling in the form, namely, "Daily Report" (see Appendix C) for the surveillance of avian influenza. In case of having ill and dead animals in the community, the evidence must be reported to the livestock authority. In addition, if there were persons sick of influenza or were suspected cases of avian influenza, the cases must be reported to the health worker at the Health Center. Then, key community members had to the report those activities, using the record forms, to the researcher every month on the meeting schedule.

4. The structured questionnaire for the posttest experimental program: The questionnaire consisted of 5 parts. The structured questionnaire consisted of three parts that were similar to the pretest form in the implementation program. Another two parts were Part 4 and Part 5 as follows.

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Part 4 people's satisfaction to the project and activities of avian influenza prevention and control in the study village. It consisted of 18 items and 54 scores.

The scoring method was applied from Likert Scale, using a three-scale item. The scoring of people's satisfaction question was assigned as following:

Very satisfactory	3 points
Moderate satisfactory	2 points
Less satisfactory	1 point
Not satisfied	0 point

The level of people's satisfaction to the project and activities for prevention and control of avian influenza were grouped into 3 levels by criteria as follow:

< 18 scores categorized as a low satisfaction.

18-36 scores categorized as a moderate satisfaction.

> 36 scores categorized as a very satisfaction.

Part 5 people's participation in the project activities prevention and control of avian influenza consisted of 4 items.

5. Questions for the assessment of "Self-esteem" were measured with the Rosenberg Self-Esteem Scale (85), which included ten items. To measure the feeling of the key community members and household representatives who assessed themselves as they were significant and accepted by the society. In addition, they got an ability to do something successfully. Ten key community members and ten household representatives using an in-depth interview assessed it.

Steps of developing the instrument

1) Reviewed concepts, theories, related research about avian influenza and results from the preliminary study.
2) Constructed interview schedule framework according to the study objectives, and the conceptual framework, variables and dimensions of each variable. Then above information were used to construct the questionnaire.
3) Designed interview questions.

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4) Assessed contents and the validity by the thesis advisers and experts. Then the revision was made according to the expert's suggestions.
5) All research instruments were tested for their content validity and reliability. The Conbrach alpha technique was used to assess the reliability of the sum of all items and each item. The results from the alpha analysis were used to improve or to adjust for the questionnaire items.

3.2.6 Developing the CBE Curriculum

The community-based empowerment (CBE) curriculum was conducted by using all experiences from the training about the education techniques, as well as knowledge and concepts from related literature review. Discussion between the researcher and stakeholders was held during the process of curriculum construction for consideration of its appropriateness. The objectives of the CBE course were: 1) to enhance the stakeholders to understand and respect oneself and others, 2) to develop creativity and critical consciousness, 3) to build a working team, 4) to develop problem solving skills, and 5) to set a plan for avian influenza prevention and control in their villages.

The CBE curriculum for the stakeholder training included sixth sessions:

Session 1 Introduction to and overview of the CBEP role of stakeholders

Community participation was viewed as the only approach that was cost-effective and that provided effective disease control over the long run. In this case, community members were required to undertake the risk reduction measures, such as to eliminate animal carcass properly, and to use protective instruments. They had to improve the environmental sanitation of livestock and its premises, and to report whether there were suspected cases in humans and animals by developing a daily-report, etc. These activities needed the community participation and sustainable behaviors. Community was a focal point in developing, implementing and evaluating of the avian influenza program, so called the community-based program. It was also the center for continuous learning experiences of the community members.

Session 2 Knowledge of Avian Influenza

H5N1 is an avian influenza virus. It is a pandemic threatening disease. H5N1

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influenza is what commonly meant when talking of “bird flu” or “avian influenza” and is a viral disease that causes illness in many species including humans. Avian influenza (H5N1) is a subtype of the species called avian influenza virus (bird flu). Avian influenza is a disease and avian influenza virus is a species. The avian influenza virus subtypes are labeled according to an H number and a N number. Infected birds pass on H5N1 through their saliva, nasal secretions, and feces. Other birds may pick up the virus through direct contact with these excretions or when they have contact with surfaces contaminated with this material. Because migratory birds are among the carriers of the H5N1 virus, it may spread to all parts of the world. Past outbreaks of avian flu have often originated in crowded conditions in Southeast and East Asia, where humans, pigs, and poultry live in close quarters. In these conditions, a virus can mutate into a form that more easily infects humans. The current method of prevention in animal populations is to destroy infected animals, as well as animals suspected of being infected. In Southeast Asia, millions of domestic birds have been slaughtered to prevent the spread of the virus. In 2004, the World Health Organization reports 23 human casualties of H5N1 outbreaks in Asia. Eight of these were in Thailand and 15 in Vietnam. Outbreaks have also been reported among poultry in Cambodia, China, Indonesia, Japan, Laos, and South Korea, but so far none of these is reported to have infected humans. According to the World Health Organization, flu pandemics can be expected to occur three or four times every 100 years. The WHO quotes experts as agreeing, “another influenza pandemic is inevitable and possibly imminent”.

Session 3 What does the reservoir host that carry avian influenza?

All birds are thought to be susceptible to infection with avian influenza, though some species are more resistant to infection than others. Infection causes a wide spectrum of symptoms in birds, ranging from mild illness to a highly contagious and rapidly fatal disease resulting in severe epidemics. The latter is known as “highly pathogenic avian influenza”. This form is characterized by sudden onset, severe illness, and rapid death, with a mortality that can approach 100%. Fifteen subtypes of influenza virus are known to infect birds, thus providing an extensive reservoir of influenza viruses potentially circulating in bird populations. To date, all outbreaks of the highly pathogenic form have been caused by influenza A viruses of subtypes H5

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and H7. Migratory waterfowl - most notably wild ducks – are the natural reservoirs of avian influenza viruses, and these birds are also the most resistant to infection. Domestic poultry, including chickens and turkeys, are particularly susceptible to epidemics of rapidly fatal influenza. Direct or indirect contact of domestic flocks with wild migratory waterfowl has been implicated as a frequent cause of epidemics. Live bird markets have also played an important role in the spread of epidemics.

Session 4 How can people get avian influenza?

The risk from avian influenza is generally low to most people because the viruses occur mainly among birds and do not usually infect humans. However, during an outbreak of avian influenza among poultry (domestic chicken, ducks, turkeys), there is a possible risk to people who have contacted with infected birds or surfaces that have been contaminated with excretions from infected birds. The current outbreak of avian influenza A (H5N1) among poultry in Asia is an example of avian influenza outbreak that has caused human infections and deaths. In such situations, people should avoid contact with infected birds or contaminated surfaces, and should be careful when handling and cooking poultry.

Session 5 What signs and symptoms should they know after they get avian influenza infection?

Since H5N1 is an influenza virus to infect animals, symptoms similar to those of the common flu, such as fever, cough, sore throat, and sore muscles, can develop in infected humans. However, in more severe cases, pneumonia and respiratory failure can develop and eventually cause death. Patients with H5N1 avian influenza have rarely had conjunctivitis, unlike human cases of infection by the H7 viruses. Severe infection from H5N1 caused multiple lung infections (including pus, fever, cough), lung scar tissue, fluid in the space surrounding the lungs, enlarged lymph nodes and cavities forming in the lung tissues.

Antiviral agents for influenza: Four different influenza antiviral drugs (amantadine, rimantadine, oseltamivir, and zanamivir) are approved by the U.S. Food and Drug Administration (FDA) for the treatment and/or prophylaxis of influenza. All four medicine have activity against influenza A viruses. However, sometimes influenza strains can become resistant to these drugs, and therefore the drugs may not always be effective. For example, analyses of some of the 2004 H5N1 viruses isolated

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from poultry and humans in Asia have shown that the viruses are resistant to two of the medications (amantadine and rimantadine).

Session 6 What can the community do to prevent avian influenza?

The avian influenza problem is not solely related to biomedical aspect but also to social, cultural, and economic as well. Therefore, the method for prevention and control of avian influenza must emphasize on people in the local outbreak of the avian influenza in poultry. To improve of individual hygiene, food safety, proper carcass elimination, used safeguard instruments to protect infectious disease mean while took carcass to eliminate, and improved environmental sanitation in and around house, and also livestock or farm in the local area where the outbreak of avian influenza occurred. Poultry infected should be promptly eliminated and not bring them to cook for food.

The CBEP main strategy was so call “ongoing training activities” that was developed around the basic concepts of problem solving process: - problem identification, clarification of the problem, identification of possible solutions, project development, project implementation, and project evaluation. Participatory learning and action, small group discussion, brainstorming, and continuous dialogue were educational methods that were used in the CBEP. The knowledge about avian influenza and the experiences received from the two trainings were applied to write the action plan of avian influenza prevention and control. After finished the second training, the action plan was promptly performed in the study village.

3.2.7 Procedure and Methods of Data Collection

Preparation

1. To gain acceptance from the study, the researcher requested a recommendation letter from Faculty of Tropical Medicine, Mahidol University and sent permission letters to the Provincial Governor, Provincial Health Office, Song Phi Nong District Officer, Song Phi Nong District Health Officer, the mayor of Thung Khok Sub-district Administrative Organization, and chief of Long Tong Village

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Health Center. The researcher also visited and made understanding in each level, district and sub-district, to explain the objectives of the research, discuss about avian influenza problem, the achievement of the program for prevention and control the avian influenza in the study area, and the concept of empowerment that would be conducted in the district.

2. To create relationships within the community level in term of formal and informal contacts operated by the key informants.

Implementation

1. Before the implementation, we prepared an in-depth interview schedule, a structured questionnaire, transect-walk checklist, observation guidelines and village map during May – July 2005. Five interviewers were recruited from Song Phi Nong district and were trained how to use questionnaire for one day.

2. The researcher visited the key community stakeholders at home to observe the social network, provided health education, communication and environmental improvement.

3. The socio-economic data of respondents, KAP on avian influenza, self-efficacy were analyzed to approve the empower of the program

4. The researcher, the public health officers from District Health Office and Ban Long Tong Health Center met to plan the training for the key community stakeholders one day on June 13, 2005.

5. The researcher and staff provided the training for the key community members. The training was divided into two phases, in which one day was needed to operate. The first phase was carried on June 29, and the second phase was on July 8, 2005. At the end of the training, the key community members planned the activities four times for the next five months.

6. The researcher feedback information from the discussion to both the facilitative and the key community members for an exchange and enhance an awareness of the problems under the implementation.

7. The researcher, the facilitative, and the key community members arranged activities for prevention and control program. The meeting was set every fifth day of the month, for five months.

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8. During the implementation program, the researcher closely monitored for its implementation and evaluation of the process of the community-based empowerment program for consecutively six months. While processing the implementation from the feedback of the stakeholders (community members), there were three proposed plans setup from the stakeholders (key community members and researcher). After the implementation, the immediate outcome, the post structured, and in-depth interviews with the key community members were conducted during November 1- 7, 2005.

The collection of data was done by the researcher and five research assistants. All of five assistants were public health officers from Song Phi Nong District Health Office, Thung Khok Sub-district Health Center and Ban Long-Tong Health Center. They were trained by the researcher about the CBE process and data collection trained them.

Quantitative and qualitative data were collected. The quantitative data collections were performed twice; pretest and posttest, by using the structured interview. The Daily Report for the disease surveillance was assigned to record daily through out the implementation period (see Appendix C).

The qualitative data collection was conducted among the key community stakeholders and household representatives by using the in-depth interview, observation, and home visit forms.

3.2.8 Data Analysis

By the end of the implementation, the data were organized and entered in the statistic software program. STATA software program was applied for analyzing the data that were divided into 2 parts.

1. Descriptive statistics determining minimum, maximum, mode, mean, standard deviation, frequency, distribution, and percentage were calculated to describe the general information such as socio-demographic characteristics of the target population, self-efficacy, knowledge, attitudes, and practices towards avian influenza.

2. Analytical statistics

1) Chi-square tests were used to examine the relationships between

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socio-demographic characteristics and knowledge, attitudes and practices toward avian influenza.

2) Paired t-test was used to examine the differences of mean values in self-efficacy of essential prevention and knowledge, attitudes, and practices toward avian influenza between before and after the implementation.

3) Logistic Regression was applied to explain of the relationships of general characteristics, including, sex, age, marital status, educational level, occupation, family income, KAP, self-efficacy, having children or elderly, received information, raising domestic poultry, and satisfaction in the project with people's participation in the project activities for prevention and control of avian influenza.

3.2.9 Protection of Human Subjects

Mahidol University Ethical Committee Members approved the Ethical Clearance of this research (Appendix E). The researcher and interviewers explained the purposes of the study to all subjects who were the population subjects. They had human right to refuse or to quit to participate in the study at any time and they would receive services and treatment as well as they usually have. Then the researcher and/or interviewers read the informed consent information to the participants and asked them to sign their name in the form. They were also informed that all information they gave to the study would be confidential. If they had any questions, the researcher would be available to answer them.

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CHAPTER IV
RESULTS

With respect to the objectives of this study, the study results were presented in each Phase as following.

4.1 PHASE 1: KAP Survey regarding Prevention and Control of Avian Influenza Among People in Song Phi Nong District, Suphan Buri Province.

This study was conducted in 14 of 15 sub-districts in Song Phi Nong District, Suphan Buri Province. The study population comprised 784 representatives from household members who completely responded to the structured quantitative questionnaire concerning to KAP of avian influenza. Results are present in separate parts of socio-economic and KAP of the disease.

4.1.1 Socio-demographic Characteristics of the Respondents

Socio-demographic characteristics of the respondents are presented in Table 6. The respondents were 277 males and 577 females, ages were ranged from 15 to 65 years. More than half of them (54.8%) were between 32 – 48 years. The majority of them (75.1%) finished primary school and 78.6% were married. Most respondents were Buddhist. Occupations were slightly different between those who were agriculturists and employed labors 42.3% and 40.4%, respectively. The proportion of those who earned 5000 – 10,000 Baht and who earned less than 5,000 Baht per month was a little difference, 46.4% and 43.6%, respectively. Almost all of respondents (80.6%) reported that they had elderly and/or children living in their houses and 48.6% of those had the children 0-15 years old. More than half of the respondents (53.8%) accessed local health center for their health care service. More than half (61.6%) took 10-30 minutes for traveling to the health center. Slightly less than two-

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third (62.2%) rode a motorcycle to the health care service. Almost all study samples had their own house and land (94.6%). More than third (39.3%) were the head of household and 36.2% were the housewife. Almost of respondents (95.9%) received avian influenza information through television sets (91.5%). More than 90% of the respondents collected garbage and disposed by burning by themselves.

Table 6 Number and Percentage of Respondents by Socio-demographic Characteristics, Song Phi Nong District, 2005.

Socio-demographic characteristics		Number (N = 784)	Percentage
Sex	Male	277	35.3
	Female	507	64.7
Age (years)	15 – 31	214	27.3
	32 – 48	430	54.8
	49 – 65	140	17.9
$\bar{X}$ = 43.65, S.D. = 12.56			
Educational Level			
	Never attained	35	4.5
	Primary school (1-6)	589	75.1
	High school (1-6)	140	17.9
	Diploma	11	1.4
	Bachelor Degree	9	1.1
Marital Status			
	Single	111	14.2
	Married	616	78.6
	Widowed	31	4.0
	Divorced	2	0.3
	Separated	24	3.1
Religion			
	Buddhist	783	99.9
	Christian	1	0.1

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Table 6 Number and percentage of respondents by socio-demographic characteristics (Cont).

Socio-demographic characteristics	Number (N = 784)	Percentage
Primary Job		
Unemployment	13	1.7
Government officer	2	0.3
Employed laborer	317	40.4
Agricultural	332	42.3
Student	4	0.5
Housewife	22	2.8
Trade	87	11.1
Others	7	0.9
Monthly family income		
< 5,000	342	43.6
5,000 – 10,000	364	46.4
10,000 – 15,000	56	7.1
> 15,000	22	2.8
Having elderly and/or children 0 – 15 years old		
No	152	19.4
Yes (both children and elderly)	632	80.6
Had elderly > 60 years old (N=784)	251	32.0
Had children 0-15 years old (N=784)	381	48.6
Identified by year old group (more than one answer)		
0-5 years (n=381)	286	75.1
6-10 years (n=381)	225	59.1
11-15 years (n=381)	252	66.1
Places of receiving health care services		
Public health center	422	53.8
Public hospital	269	34.3
Private medical physician	72	9.2
Pharmacy	11	1.4
Private hospital	9	1.1
Others	1	0.1

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Table 6 Number and percentage of respondents by socio-demographic characteristics (Cont).

Socio-demographic characteristics		Number (N = 784)	Percentage
Time traveling to health care service			
	< 10 minutes	154	19.6
	10 – 30 minutes	483	61.6
	31 – 60 minutes	110	14.0
	> 60 minutes	37	4.7
Type of transportation			
	Motorcycle	488	62.2
	Private car	168	21.4
	Public vehicle	70	8.9
	Walking	23	2.9
	Bicycle	17	2.2
	Motorboat	6	0.8
	Others	12	1.5
House and land possession			
	Yes	742	94.6
	No	42	5.4
Status in the family	Head of household	308	39.3
	Housewife	284	36.2
	Son or daughter	135	17.2
	Kindred	23	2.9
	Son or daughter-in-law	22	2.8
	Parents	12	1.5
Getting information about avian influenza			
	Yes	752	95.9
	No	32	4.1
Sources of information			
	T.V. set	717	91.5
	Health workers	388	49.5
	Newspaper	296	37.8
	Radio	287	36.6
	Village Health Volunteers	272	34.7
	Kindred	48	6.1
	Friends	46	5.9
	Drug stores	10	1.3
	Others	36	4.5

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Table 6 Number and percentage of respondents by socio-demographic characteristics (Cont).

Socio-demographic characteristics	Number (N = 784)	Percentage
Methods of garbage disposal		
Collected and burnt	720	91.8
Collected and picked up by TAO/municipality	36	4.6
Collected and buried	15	1.9
Put on ground	10	1.3
Collected as a heap	3	0.4

Table 7 displays number and percentage of respondents who raised poultry and had history of their poultry contacts. Nearly half of samples (43.6%) raised poultry in their house yard. Very few of them (0.5%) worked in the poultry farm. More than a half of poultry raised (55.3%) were domestic (native) chicken. Slightly less than two-thirds (63.0%) of those raised 10- 50 domestic chicken per household and more than 80% raised them freely in the house environment. More than half of those who raised domestic chicken (54.5%) seldomly contacted their domestic chicken. Most of family members were feeders who always exposed to the chicken by themselves (75.7%).

Thirty four point five percent of the respondents raised fighting roosters. More than third (39.8%) raised 10 -20 roosters per household and most of them (80.5%) fed the fighting roosters in their surrounding. Among those who raised the roosters, 36.4% contacted the fowl daily. Persons who were chicken feeders mostly exposed to the poultry were the respondent themselves (70.3%). Only one respondent (0.3%) raised true bred meat poultry about 20,000 chicken. It was a closed farm. The respondent who owned the farm contacted chicken everyday and also exposed to the chicken secretion, feces, and contaminated surface of the barn. There were 12 respondents (3.5%) who raised hybrid laying chicken. Among those, 66.6% raised >1,500-2,500 chicken. Most of them (66.7%) had open farms. Almost of the farmers contacted their

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chicken regularly during the feeding, watering and cleaning by themselves.Twenty of respondents (5.8%) raised ducks. The number of ducks mostly raised varied from 10 – 50. More than half of them (55%) fed their ducks in surrounding environment. There was no difference between respondents who contacted ducks every day and contacted them sometimes. Around sixty percent of the respondents exposed to their poultry while feeding. Only three respondents (0.9%) reported that they raised geese. Two of them raised one or two geese at home. All of them kept geese freely in household areas and they seldomly contacted the geese. It was found that 36 of the respondents (10.5%) raised other kinds of birds (e.g. turtledove, mynas). Seventy five percent raised them less than 10. Almost a third kept the birds in coop or cage. More than 40 percent seldomly contacted that fowl.

Table7. Number and percentage of respondents by type of poultry raised, Song Phi Nong District, 2005.

Type of poultry raised		Number (N = 784)	Percentage
Raising poultry in household			
	Yes	342	43.6
	No	442	56.4
Working in farm	Yes	4	0.5
	No	438	99.5
Type of poultry raised (more than one answered)			
	Native domestic chicken	189	55.3
	Fighting roosters	118	34.5
	Ducks	20	5.8
	Bred laying chicken	12	3.5
	Geese	3	0.9
	Bred meat chicken	1	0.3
	Others	36	10.5
1. Number of domestic chicken raised per house (n = 189)			
	< 10	57	30.2
	10 – 50	119	63.0
	51 – 91	7	3.7
	> 91	6	3.2
	Min = 1, Max = 1,000		

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Table 7 Number and percentage of respondents by type of poultry raised (cont).

Type of poultry raised	Number (N = 784)	Percentage
1.1 Places for feeding domestic chicken		
House yard	159	84.1
Coop/cage (Closed farm)	28	14.8
Open farm	1	0.5
Others	1	0.5
1.2 Frequency of contact with domestic chicken		
Everyday	14	7.4
Sometimes	61	32.3
Seldom	103	54.5
No contact	11	5.8
1.3 Family members exposed to domestic chicken (multiple answers)		
Respondents	143	75.7
Spouse	84	44.4
Children	22	11.6
Parents	17	9.0
Others	17	9.0
2. Number of fighting roosters raised (n = 118)		
< 10	27	22.9
10 – 20	47	39.8
21 – 31	25	21.2
> 31	19	16.1
Min = 1, Max = 100		
2.1 Places of raising fighting roosters		
House yard	95	80.5
Coop/cage	23	19.5
2.2 Frequency of contact with fighting roosters		
Everyday	43	36.4
Sometimes	32	27.1
Seldom	31	26.3
No contact	12	10.2

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Table 7 Number and percentage of respondents by type of poultry raised (cont).

Type of poultry raised	Number (N = 784)	Percentage
2.3 Family member exposed to fighting roosters (multiple answers)		
Respondents	83	70.3
Spouse	35	29.7
Children	14	11.9
Parents	7	5.9
Others	18	15.3
3. Number of bred laying chicken (n = 12)		
1,500 – 2,500	8	66.6
2,501 – 3,501	2	16.7
> 3,501	2	16.7
Min = 1,500, Max = 10,000		
3.1 Places of raising bred laying chicken		
Open farm	8	66.7
Closed farm	1	8.3
Coop/cage	2	16.7
Others	1	8.3
3.2 Frequency of contacting laying chicken		
Everyday	10	83.3
Sometimes	2	16.7
3.3 Family member exposed bred laying chicken (multiple answers)		
Respondents	12	100.0
Spouse	8	66.0
Parents	1	8.3
4. Number of duck raised (n = 20)		
< 10	9	45.0
10 – 50	9	45.0
> 51	2	10.0
Min = 1, Max = 700		
4.1 Places of raising ducks		
Surrounding area	11	55.0
Open farm	1	5.0
Coop/cage	6	30.0
Others	2	10.0

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Table 7 Number and percentage of respondents by type of poultry raised (cont).

Type of poultry raised	Number (N = 784)	Percentage
4.2 Frequency of contacting ducks		
Everyday	2	10.0
Sometimes	8	40.0
Seldom	8	40.0
No contact	2	10.0
4.3 Family members exposing ducks (multiple answers)		
Respondents	13	65.0
Spouse	6	30.0
Children	5	25.0
Others	2	10.0
5. Number of other species of poultry raised (n = 36)		
< 10	27	75.0
10 – 50	8	22.2
> 51	1	2.8
Min = 1, Max = 74		
5.1 Places of raising that poultry		
House yard	4	11.1
Open farm	1	2.8
Coop/cage	31	86.1
5.2 Frequency of contacting that poultry		
Everyday	3	8.3
Sometimes	11	30.6
Seldom	15	41.7
No contact	7	19.4
5.3 Family members exposing that poultry (multiple answers)		
Respondents	19	52.8
Spouse	15	41.7
Children	1	2.8
Parents	3	8.3
Others	5	13.9

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Table 8 illustrates respondents who slaughtered poultry for consuming in their families. It was found that more study populations (74.9%) preferred to purchase the poultry meat for consuming in their families. They were more likely to buy chicken meat from a fresh-food market in the municipality (73.7%). Approximately fourth (25.1%) slaughtered the fowl they raised for consuming in the family and very few persons (2.0%) used safeguard to protect themselves. It was reported that almost a half of those who slaughtered the poultry (45.7%) were done by themselves. Slightly more than half of those who slaughtered poultry used the yard of the house to operate. Almost all of the poultry were slaughtered by cutting the neck (98.5%), and 47.2% of the slaughters destroyed the carcasses by burning, and 42.6% by burying.

Table 8 Number and percentage of respondents who slaughtered poultry for consuming in family, Song Phi Nong District, 2005.

Statement		Number (N = 784)	Percentage
Place of purchasing poultry for consuming in family			
	Fresh-food market of municipality	578	73.7
	Shop in the village	39	5.0
	Department store	9	1.1
	Market fair in the village	158	20.2
Slaughter poultry for consuming			
	Yes	197	25.1
	No	587	74.9
Wearing personal protective safeguard			
	Yes	4	2.0
	No	193	98.0
Person slaughtered poultry for consuming in family (n = 197)			
	Respondents	90	45.7
	Brother or sister	27	13.7
	Parents	23	11.7
	Son/daughter	18	9.1
	Others	39	19.8

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Table 8 Number and percentage of respondents who slaughtered poultry for consuming in family.

Statement Items	Number (N = 784)	Percentage
Place of slaughtering poultry		
House yard	109	55.3
Kitchen	69	35.0
Underneath the house	2	1.0
Others	17	8.6
Method of killing poultry		
Cutting the neck	194	98.5
Hitting the head	1	0.5
Others	2	1.0
Disposing of chicken carcasses		
Burning	93	47.2
Burying	84	42.6
Throwing away in the yard	13	6.6
Feeding animals	5	2.6
Others	2	1.0

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4.1.2 Knowledge, Attitudes, and Practices toward Avian Influenza

Knowledge about Avian Influenza

Table 9 displays knowledge of respondents about avian influenza. When considering each item, it was found that more than 90% of the respondents knew that: (1) the direct contact of infected or dead animals and consuming of dead chicken meat are at highest risk of getting disease. (2) avian influenza can cause illness and death. (3) the method to prevent avian influenza is to keep out of the contact with sick or dead chicken. (4) wearing the safeguard when they are going to touch sick chicken or carcasses, (5) contact the poultry is the risk of avian influenza, and (6) children and elderly are highly susceptible to be infected by avian influenza in the contaminated area.

In the other hand, more than 90% of them did not know (1) the major signs and symptoms of avian influenza, (2) modes of transmission of avian influenza, (3) risk persons eat uncooked meat of dead chicken or contact dead chicken, (4) indirect contact with secretion of infected animals can cause disease infection, and (5) avian influenza can not transmitted from person to person.

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Table 9 Number and percentage of respondents who answered the questions of knowledge about avian influenza by statements.

Statement	answer			
	Correct		Incorrect	
	No.	%	No.	%
1. Major signs and symptoms of avian influenza.	2	0.3	782	99.7
2. Causative agent of avian influenza.	346	44.1	438	55.9
3. Modes of transmission of avian influenza: Direct contact of avian or infected animals.	66	8.4	718	91.6
4. Risk persons eat uncooked dead chicken meat or contact to dead chicken?	19	2.4	765	97.6
5. Indirect contact with secretion of infected animals.	40	5.1	744	94.9
6. Avian influenza can transmit from person to person.	44	5.6	740	94.4
7. Avian influenza is a transmittable disease.	539	68.8	245	31.3
8. Avian influenza is a communicable disease.	467	59.6	317	40.4
9. The highest risk of avian influenza is a direct contact with infected or dead animals as well as eating dead chicken meat.	725	92.5	59	7.5
10. Avian influenza can be treated.	541	69.0	243	31.0
11. Avian influenza can cause illness and death.	756	96.4	28	3.6
12. Prevention methods for avian influenza infection is not to contact with sick or dead chicken.	765	97.6	19	2.4
13. Wearing safeguard when contact sick chicken.	764	97.4	20	2.6
14. Wearing safeguard when contact a carcass.	764	97.4	20	2.6
15. Children and elderly are the highest susceptibility to avian flu in the contaminated area.	731	93.2	53	6.8
16. Highest risk is a direct contact with infected or dead animals as well as eating dead chicken meat.	764	97.4	20	2.6
17. Vaccination for poultry affect the mutation of avian influenza virus.	264	33.7	520	66.3
18. People who contact the poultry are at risk to avian influenza.	761	97.1	23	2.9

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Table 10 shows ranking scores of the knowledge. The scores varied from 0-18 with the mean scores = 10.6 and standard deviation = 1.8. The knowledge was classified into 3 categories of low, moderate, and high. The scores of low level ranged from 1-6 points, middle level 7-12 points, and high level 13-18 points, respectively. Majority of the respondents had knowledge in the moderate level (85.1%). However, the proportion of the high level was greater than the low level, 12.1% and 2.8%, respectively.

Table 10 Number and percentage of respondents identified by knowledge levels of avian influenza.

Levels of Knowledge	Number (N = 784)	Percentage
Knowledge (Total scores = 18)		
Low (1 – 6 scores)	22	2.8
Moderate (7 – 12 scores)	667	85.1
High (13 – 18 scores)	95	12.1

$\overline{X}$ = 10.6, SD = 1.8, Minimum score = 4, Maximum score = 14

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Attitudes toward Avian Influenza

Table 11 shows number and percentage of respondents regarding their perceptions that were categorized into agreed, not sure, and disagreed. There were 17 items tested for the attitudes toward avian influenza. It was found that more than 90% of the respondents agreed with the statements: (1) Avian influenza can be prevented, (2) Eating sick or dead chicken meat are at risk to the avian influenza, (3) People who eat uncooked dead chicken meat or contact to dead chicken can get avian influenza, (4) People who have contacted the poultry are more likely than who have never contacted the poultry to get avian influenza infection, (5) Hand washing with soap after contact with the poultry can prevent the avian influenza viruses, (6) Consumption of properly cooked chicken meat and egg can protect the infection, (7) Children and elderly and immune suppressing persons are susceptible to get infection easier than healthy persons, (8) People who feed fighting roosters and have close association especially with contaminated areas are the population at risk to be infected from the avian influenza, (9) Wearing personal protective guards while working in the poultry farm or taking animals carcass to dispose can protect the infection of the avian influenza, (10) Housewives and chefs play an important role in the prevention of the avian influenza and they must be good cook, and always be sanitized, (11) The confirmed infectious poultry with avian influenza will be immediately killed or eliminated to prevent the spread out of avian influenza infection to other kinds of the poultry, and (12) When there have domestic poultry get sick and die with unknown cause more than one case within one day, relevant person must inform the livestock officer to take carcasses tested and eliminated. In contrast, more than 60% of the respondents disagreed with the statements of: (1) At present, you are at risk to avian influenza, and (2) At present, your family members are at risk to avian influenza.

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Table 11 Number and percentage of respondents regarding their perceptions, with the scales of agreed, not sure, and disagreed by items.

Attitudes	Agreed		Not sure		Disagreed		Mode
	No.	%	No.	%	No.	%	
1. You are concerned to the avian influenza.	509	64.9	45	5.7	230	29.3	Agreed
2. Avian influenza is a preventable disease.	754	96.2	23	2.9	7	0.9	Agreed
3. Eating sick or dead chicken meat is risk to avian influenza.	762	97.2	16	2.0	6	0.8	Agreed
4. People who eat uncooked dead chicken meat or contact with dead chicken can get avian influenza.	765	97.6	15	1.9	4	0.5	Agreed
5. People who contacting poultry, killing, selling, transferring, disposing carcass, children playing with poultry, are more likely to get avian influenza infection than people who never contacting poultry.	767	97.8	13	1.7	4	0.5	Agreed
6. People who get common cold with high fever, chill, sore throat, cough, and fatigue may be infected by avian influenza.	476	60.7	248	31.6	60	7.7	Agreed
7. Hand washing with soap after contact with poultry could prevent avian influenza.	734	93.6	23	2.9	27	3.4	Agreed
8. Consumption of fully cooked chicken meat and eggs can protect the infection of avian influenza.	767	97.8	11	1.4	6	0.8	Agreed
9. Children and elderly or immune suppressing are susceptible to infection easier than the normal person.	757	96.6	17	2.2	10	1.3	Agreed
10. People who fed fighting roosters and had close association especially with contaminated areas are population at risk to be infected from avian influenza.	730	93.1	28	3.6	26	3.3	Agreed
11. Wearing mask, gloves, goggle and boot while working in poultry farm or keeping animal carcass to dispose can protect infection of avian influenza.	756	96.4	15	1.9	13	1.7	Agreed

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Table 11 Number and percentage of respondents regarding their perceptions, with the scales of agreed, not sure, and disagreed by items (Cont).

Attitudes	Agreed		Not sure		Disagreed		Mode
	No.	%	No.	%	No.	%	
12. Housewives and chefs play an important role in prevention of avian influenza. They must fully cook, and always sanitize.	754	96.2	14	1.8	16	2.0	Agreed
13. At present, are you at risk to avian influenza?	209	26.7	76	9.7	499	63.6	Disagreed
14. At present, are your family members at risk to avian influenza?	213	27.2	74	9.4	497	63.4	Disagreed
15. The confirmed infectious poultry with avian influenza will be immediately killed or eliminated to prevent the spread out of avian influenza infection to other kinds of poultry.	731	93.2	23	2.9	30	3.8	Agreed
16. When there are domestic poultry get sick and died with unknown cause more than one case within one day, a relevant person must inform the livestock officer to take carcass tested and eliminated.	732	93.4	19	2.4	33	4.2	Agreed
17. Relatives or persons who have close relationship with a patient who have high fever, chill, sore throat and cough, must not contact mucous and saliva and other secretion of the patient.	700	89.3	55	7.0	29	3.7	Agreed

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Table 12 displays attitudes levels of respondents. The score ranged from 1-51 were the mean score was 46.27, and the S.D. = 3.54. The attitude was classified into 3 categories of high, moderate, and low. The scoring technique was applied from a 3-point scale that had been used in the part of perception. The scores of low attitude were ranged from 1-17 points; the scores of moderate attitude were from 11-34 points, and the scores of the high attitude from 35-51 points. The majority of respondents had positive attitudes toward avian influenza (98.9%).

Table 12 Number and percentage of respondents identified by attitudes level of avian influenza.

Attitudes level of avian influenza	Number (N = 784)	Percentage
Attitudes (Total scores = 51)		
Low (1 – 17 points)	0	0.0
Moderate (11 – 34 points)	9	1.1
High (35 – 51 points)	775	98.9

$\bar{X}$ = 46.27, S.D. = 3.54, Minimum score = 19, Maximum score = 51

These highly positive attitudes toward the disease mean that the study population had an intention to act toward prevention and control of avian influenza including, improvement of individual hygiene, food safety, proper carcass elimination, using of safeguard instruments to protect viruses, and improvement of an environmental sanitation in and around the house.

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Table 13 shows number and percentage of the respondents regarding practices toward avian influenza. More than half of respondents (52.4%) purchased chicken and chicken products from butcher shops that were not have food inspection and warranty. When they or their family members got common cold with high fever, chill, sore throat, and cough, they immediately went to the physician or health worker every time, especially during the outbreak in the poultry population. More than half of them (57.7 %) advised their family members when they got common cold every time. Almost all of the respondents (98 %) did not purchase sick or dead chicken. Slightly less than half of respondents (48.1 %) protected themselves all the times while 45.9% of them did not do it. Moreover, more than half (57.0%) did not take a bath or a shower and changed new clothes after work. The proportion of the respondents who cleaned the personal protective safeguards (48.2%) was submissive higher than those who did not do it (46.8%). However, the majority of the respondents did not eat soft-boiled or uncooked egg (95.2%). Approximately two-thirds (67.2%) cleaned cages with detergent and water at least once a week. Almost 80 % of them watched on children by warning them not to handle any chicken or birds and not to carry any carcasses. Almost 100% ate fully cooked chicken meat and eggs regularly. Furthermore, 98.5% of them made well done foods before eating every. Almost all of them (97.7%) and their family members (96.6 %) properly practiced following the regulations of avian influenza prevention.

Table 14 illustrates number and percentage of the respondents by practice levels. The score ranged from 1-30 with the mean score 18.2 and standard deviation 4.0. Practice was classified into 3 categories, low, middle, and high. The score of low level ranged from 1-10, middle level 11-20, and high level 21-30, respectively. It was found that slightly more than two-thirds of the respondents were categorized in middle level (67.5 %) whereas 29.3 % were in high level.

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Table 13 Number and percentage of respondents regarding their practices about preventive avian influenza by items, Song Phi Nong District, 2005.

Practices	All time		Sometimes		No practice		Mode
	No.	%	No.	%	No.	%	
1. Do you purchase only chicken and chicken products from the inspected?	129	16.5	244	31.1	411	52.4	No practice
2. Do you immediately go to the physician or health worker when you get common cold with high fever, chill, sore throat, and cough, especially during the outbreak in poultry?	581	74.1	97	12.4	106	13.5	All time
3. Do you immediately take your family member who get common with high fever, chill, sore throat, and cough to the physician or health worker, especially during the outbreak in poultry?	587	74.9	95	12.1	102	13.0	All time
4. Do you advise your family members when they get common cold to prevent spread of disease to other persons?	452	57.7	138	17.6	194	24.7	All time
5. Do you purchase sick chicken with signs of cyanosis, ruffled feathers, snivel, diarrhea etc., or dead chicken slaughtered for sale?	12	1.5	4	0.5	768	98.0	No practice
6. Do you always protect yourself properly before contacting sick poultry or dead by wearing the personal protection safeguards (gloves, glasses, a mask, an apron, a pair of boots)?	377	48.1	47	6.0	360	45.9	No practice
7. Do you take a bath or shower, and change new cloths after work?	280	35.7	57	7.3	447	57.0	No practice

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Table 13 Number and percentage of respondents regarding their practices about preventive avian influenza by items, Song Phi Nong District, 2005 (Cont).

Practices	All time		Sometimes		No practice		Mode
	No.	%	No.	%	No.	%	
8. Do you always disinfect or clean the personal protective safeguards (e.g. the dirty clothes, apron, mask, gloves, glasses, and have them dried in the sunlight) before re-using?	378	48.2	39	5.0	367	46.8	All time
9. At present, do you eat half-boiled or raw eggs?	19	2.4	19	2.4	746	95.2	No practice
10. Do you continuously clean cages with detergent and water at least once a week?	189	24.1	68	8.7	527	67.2	No practice
11. Do you keep a close watch on children by warning them not to handle any chickens or birds and not to carry any carcasses?	624	79.6	35	4.5	125	15.9	All time
12. Do you always eat well cooked chicken meat and eggs (for protection the infection of avian influenza)?	770	98.2	7	0.9	7	0.9	All time
13. Do you always cook well done foods before eating (to protect the infection of avian influenza)?	772	98.5	5	0.6	7	0.9	All time
14. Do you properly practice yourself following the regulations of avian influenza prevention by washing hands with soap before eating food, eating well cooked food, not directly contact sick and dead chicken?	766	97.7	12	1.5	6	0.8	All time
15. Can your family members properly practice themselves following the regulations of avian influenza prevention?	757	96.6	21	2.7	6	0.8	All time

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Table 14 Number and percentage of the respondents by practices level about prevention of avian influenza.

Practices level to avian influenza	Frequency (N = 784)	Percent
Practices (Total scores = 30)		
Low (1 – 10 scores)	25	3.2
Middle (11 – 20 scores)	529	67.5
High (21 – 30 scores)	230	29.3

$\overline{X}$ = 18.2, SD = 4.0, Minimum score = 6, Maximum score = 29

Behaviors of Hand Washing

Table 15 shows behaviors of hand washing with soap of the respondents to prevent avian influenza.

Before preparing food

Approximately two-thirds of the study population prepared food. More than 90 % of them washed hands every time before preparing foods and more than half of them used only the water to wash hands.

After preparing food

Submissive higher than two-thirds of the respondents were related to preparation of foods. Almost all study population had behavior of hand washing every time after preparing foods and more than a half used soap to clean their hands (94.1%).

Before eating food

Most of respondents (86%) washed their hands every time after meal and 54.6% washed hands with soap.

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After using toilet

All study population (100%) had and used toilet at home. Among those 92.5% washed hands every time after using the toilet and 60.6% regularly washed hands with soap.

After killing or cutting poultry meat

Slightly less than 20% of the respondents slaughtered and cut chicken meat for food. Almost of them (98.0%) confirmed that they washed their hands every time after they slaughtered and cut the meat. Approximately 80% of them used soap to wash their hands.

After handling poultry

Forty point two percent of the respondents handled or contacted with poultry. The majority (93.5%) washed their hands every time after handling or contacting the animals. Most of them (84.3%) used soap to clean up their hands.

After cleaning up the coop/cage of poultry

Slightly more than two-thirds of the respondents reported that they cleaned the poultry barn. Almost all of them (94.7%) washed their hands every time after cleaning the barn, and 83.3 % washed hands with soap.

After feeding and watering the poultry

About 68% of the respondents fed and watered their poultry. Among those 92.4% washed hands every time after feeding and watering the poultry. About 75% of them informed that they washed hands with soap.

Behaviors of coughing or sneezing (put on hand/handkerchief/tissue)

Almost all of the respondents protected secretion splashes by wing hand/handkerchief/tissue paper when they coughed or sneezed. About 56% of them washed their hands every time after coughing or sneezing. However, 55.2% of them used only the water to wash hands.

Behaviors of carrying and disposing garbage

About 94% of the respondents used to touch garbage and take the garbage to dispose. Eighty point four percent washed hands regularly and 64.5% used soap to wash their hands.

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After touching carcasses

Approximately 68% of respondents used to touch poultry carcasses. Almost all (96.3%) responded that they washed their hands every time after touching carcasses, and 74.0% used soap to wash their hands.

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Table 15 Behaviors of Hand Washing of the Respondents in Song Phi Nong District, 2005.

Practices	Application				Frequency of washing hands						Method of washing			
	No		Yes		No		Sometimes		All times		Water		Soap	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1.Before preparing foods	529	67.0	525	67.0	2	0.4	34	6.5	489	93.1	293	56.0	230	44.0
2. After preparing foods	255	32.5	529	67.5	3	0.6	28	5.3	498	94.1	252	47.9	274	52.1
3. Before eating foods	0	0.0	784	100.0	35	4.5	75	9.5	674	86.0	409	54.6	340	45.4
4. After using toilet	0	0.0	784	100.0	14	1.8	45	5.7	725	92.5	303	39.4	467	60.6
5. After killing poultry and cutting meat	637	81.2	147	18.8	1	0.7	2	1.3	144	98.0	28	19.2	118	80.8
6. After handling poultry	445	56.8	339	43.2	8	2.4	14	4.1	317	93.5	52	15.7	279	84.3
7. After cleaning coop/cage of poultry	540	68.9	244	31.1	5	2.0	8	3.3	231	94.7	40	16.7	199	83.3
8. After feeding and watering poultry	535	68.2	249	31.8	6	2.4	13	5.2	230	92.4	62	25.5	181	74.5
9. Protection from coughing or sneezing (use hand /handkerchief/tis sue)	14	1.8	770	98.2	161	21.0	174	22.6	435	56.4	336	55.2	273	44.8
10. After touching garbage and disposing garbage	46	5.9	738	94.1	14	1.9	79	10.7	645	87.4	257	35.5	467	64.5
11. After touching carcasses	249	31.8	535	68.2	5	0.9	15	2.8	515	96.3	138	26.0	392	74.0

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4.1.3 The Analysis of Factors Associated with Knowledge, Attitudes, and Practices (KAP) on Avian Influenza

1. Factors Associated with Knowledge toward Avian Influenza

The following data analyses display the associations between independent factors and knowledge about avian influenza. The associations were calculated by chi-square. There were 3 levels of knowledge, namely, low, medium, and high, which are presented and identified in Table 16.

In Table 16, it is found that there was a non-significant difference in a proportion of knowledge in each level between two age groups of 15-39 years and 40-65 years the latter had slightly better percent of knowledge of avian influenza in the medium level. Many males and females had knowledge in medium level, and more females were better than males (87.0% and 81.6%, respectively). Males were more likely than females to have higher level of knowledge in avian influenza. The respondents showing family income categories did not make any statistical differences between the knowledge levels.

The proportions of the respondents in each knowledge level regarding occupations were slightly non-significant difference. The respondents who were labor employees slightly having more percent of higher knowledge level. There was a significant difference in the proportions of the levels of knowledge regarding the education. The respondents who finished high school or above were more likely than who never attended school and those who finished primary school (P=0.009).

The respondents 85.8% who had children or elderly in their families were in a medium level of knowledge of avian influenza. However, a little higher level of knowledge belonged to the people without children or elderly in their household. A strong significant difference in the proportion of knowledge was found between the respondents who received and did not receive the information from media about avian influenza. The respondents who received information about avian influenza were more likely to have a better knowledge of avian influenza.

The knowledge between respondents who fed and did not feed poultry was not significantly different (χ^2 = 0.593, P = 0.743). The proportion in the medium level

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was found in the respondents who raised poultry and the high level of knowledge was found in the respondents who did not raise poultry. There was no significant difference between the level of knowledge of the respondents who slaughtered and did not slaughter poultry (P = 0.611). The respondents who did not slaughter poultry were likely to have a little a higher knowledge level of avian influenza.

Table 16 Associations of socio-demographic variables and levels of knowledge of the respondents in Song Phi Nong District, 2005.

Variables	Knowledge (N= 784)						Statistics		
	Low		Medium		High		χ^2	df	P
	n	%	n	%	n	%			
Age							4.381	2	0.112
15 – 39	5	1.7	250	83.9	43	14.4			
40 – 65	17	3.5	417	85.8	52	10.7			
Sex							5.748	2	0.056
Male	7	2.5	226	81.6	44	15.9			
Female	15	3.0	441	87.0	51	10.0			
Marital Status							0.345	2	0.842
Single	4	3.6	93	83.8	14	12.6			
Married	18	2.7	574	85.3	81	12.0			
Family income							0.310	2	0.856
< 5,000 Baht	10	2.9	293	85.7	39	11.4			
5,000 Baht and above	12	2.7	374	84.6	56	12.7			
Occupation							2.128	2	0.345
Labor and employee	7	2.2	266	83.9	44	13.9			
Agriculturalist	15	3.2	401	85.9	51	10.9			
Educational levels							9.486	2	0.009
Primary school or never schooling (< 4)	22	3.5	534	85.6	68	10.9			
High school (1-6) and above	0	0.0	133	83.1	27	16.9			

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Table 16 Associations of socio-demographic variables and levels of knowledge of the respondents in Song Phi Nong District, 2005 (Cont).

Variables	Knowledge (N= 784)						Statistics		
	Low		Medium		High		χ^2	df	P
	n	%	n	%	n	%			
Raising poultry							0.593	2	0.743
No	12	2.7	373	84.4	57	12.9			
Yes	10	3.0	294	85.9	38	11.1			
Slaughtering poultry							0.984	2	0 .611
No	16	2.7	496	84.5	75	12.8			
Yes	6	3.0	171	86.8	20	10.2			
Having children and elderly							2.743	2	0.254
No	3	2.0	125	82.2	24	15.8			
Yes	19	3.0	542	85.8	71	11.2			
Received information from media							34.322	2	< 0.001
No	6	18.8	26	81.2	0	0.0			
Yes	16	2.1	641	82.3	95	12.6			

2. Factors Associated with Attitudes toward Avian Influenza

The following analysis indicates the associations between the independent factors and attitudes toward avian influenza. The associations of attitudes and that factors were calculated by chi-square test. There are 2 levels of attitudes, namely, negative and positive attitudes, and are presented in Table 17.

There was no significant difference in the proportion of the respondents aged 15-39 and 40-45 years. The higher age group had more percentage than the lower one to have a positive attitude. Most of males and females (33.7% and 61.0%) had positive attitude. Males were more likely than females to have positive attitude. There

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was no difference in proportion between the respondents who were single and who were married toward attitude levels. Single respondents were little more percentage to have positive attitude. The proportion of the respondents considering family income was significantly different. The lowest proportion in negative attitude was found in the respondents who earned less than 5,000 Baht while the highest proportion in positive attitude was found in the respondents who earned 5,000 Baht and above. There was a not significant difference among these two groups of family income of the respondents.

The variable of occupation was a not significant difference in levels of the attitude toward avian influenza. Most of respondents had positive attitude toward avian influenza. The proportion of agriculturalists and others were more likely than employed occupations to have positive attitude. There was different in proportion of the respondents among these two groups of level of knowledge regarding education. The respondents who never attended school and finished primary school were more likely than the respondents those who finished high school or above level to have negative and positive attitude of avian influenza. The respondents with families had no children and elderly were larger percentage than whose families had children or elderly to have positive attitude toward avian influenza.

There was highly significant difference in proportion of respondents between who received information from media, radio, T.V. about avian influenza and those who did not. The respondents who received the information were more likely to have positive attitude ($p<0.001$). The majority of the respondents who raised and who did not raise poultry had positive attitude toward avian influenza. It was found no significant difference in proportion of respondents among these two groups of attitudes. The respondents who slaughtered and did not slaughter poultry in the house mostly had the same positive attitude of avian influenza. The respondents who slaughtered poultry were not significant from the respondents who did not.

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Table 17 Relationships between attitudes toward avian influenza and socio-demographic variables.

Variables	Attitudes (N= 784)				Statistics		
	Negative		Positive		χ^2	df	P
	n	%	n	%			
Age					0.412	1	0.521
15 – 39	14	4.7	284	95.3			
40 – 65	28	5.8	458	94.2			
Gender					0.372	1	0.542
Male	13	4.7	264	95.3			
Female	29	5.7	478	94.3			
Marital Status					0.185	1	0.667
Single	5	4.5	106	95.5			
Married	37	4.5	636	94.5			
Family income					1.966	1	0.189*
< 5,000 Baht	6	1.8	336	98.2			
5,000 Baht and above	3	0.7	439	99.3			
Occupation					0.610	1	1.000*
Labor and employee	4	1.3	313	98.7			
Agriculturalist and others	5	1.1	462	98.9			
Educational levels					0.484	1	0.695*
Never attained and primary school	8	1.3	616	98.7			
High school (1-6) and above	1	0.6	159	99.4			
Having children and elderly					2.763	1	0.096
No	4	2.6	148	97.4			
Yes	38	6.0	594	94.0			
Received information from media					25.388	1	< 0.001
No	8	25.0	24	75.0			
Yes	34	4.5	718	95.5			

* Fisher's Exact Test

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Table 17 Relationships between attitudes toward avian influenza and socio-demographic variables (Cont).

Variables	Attitudes (N= 784)				Statistics		
	Negative		Positive		χ^2	df	P
	n	%	n	%			
Raising poultry					0.047	1	0.828
No	23	5.2	419	94.8			
Yes	19	5.6	323	94.4			
slaughtering poultry					0.323	1	0.570
No	33	5.6	554	94.4			
Yes	9	4.6	188	95.4			

3. Factors Associated with Practices toward Avian Influenza

The following analysis presents the association between independent factors and practices to prevent avian influenza. The association of practices and factors were calculated by chi-square. There were 3 levels of practices, low, medium, and high, presented and identified in Table 18.

From table 18, it was found that the proportion of the respondents aged 15-39 and 40-65 years old was submissively different toward practices of avian influenza. Younger age group was more like to have correct practices to prevent avian influenza. There was slightly difference in proportion between males and females in practice levels. Almost one-third of them were classified in high level. Most of the respondents who were single and married practiced in medium level. The married respondents were more likely than single respondents to practice correctly. The proportion of the respondents in varied income was significant difference in practice levels. Most of every income group was categorized in medium level. The

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respondents who had family income 5,000 Baht and above were more likely than another income group to have regularly practices to prevent avian influenza. Therefore, it was found that the difference between family income and practices was statistically significantly ($p<0.05$).

Most of the respondents in each occupation had intermediate practices correctly. The highest proportion in high level of practices was found in agriculturalist and others. Most of the respondents in these two groups practiced themselves to prevent avian influenza identified in medium level. The proportion of the respondents in high level was different in proportion of the respondents in each level of practices regarding education. The respondents who never attended and finished primary school were more likely than the respondents who finished high school or above level to have proper practices in prevention and control of avian influenza. It was displayed a many difference in proportion of the respondents in low, medium, and high level regarding education. Greater proportions of the respondents who had and who did not have children or elderly were found in medium and high level of practice. It indicates that the respondents whose families were present of children or elderly were more likely to have better practice to prevent avian influenza. Consequently, there was significant difference between these two groups ($p<0.05$).

Higher proportion in high practice level was found in the respondents who have received the information. It is reasonable to assume that the respondents who have received the information were more likely to have good practices to prevent avian influenza. Moreover, the difference between practice and history of receiving information of the respondents to prevent avian influenza was statistically significant ($p<0.01$). There was difference in proportion of the respondents between who raised and did not raise poultry. The respondents who raised poultry were more likely to practice correctly to prevent avian influenza. As a result, the difference between practices and feeding experience of the poultry was statistically significant ($p<0.001$). Similarly, there was a great difference in proportion between the respondents who slaughtered and did not slaughter poultry. The respondents who slaughtered poultry were more likely to have correctly practice to prevent the avian influenza. Furthermore, there was found the significant difference between practices and slaughtering experience ($p<0.05$).

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Table 18 Relationships between preventive avian influenza practices and socio-demographic variables.

Variables	Practices (N= 784)						Statistics		
	Low		Medium		High		χ^2	df	P
	n	%	n	%	n	%			
Age							1.504	2	0.472
15 – 39	9	3.0	194	65.1	95	31.9			
40 – 65	16	3.3	335	68.9	135	27.8			
Sex							0.626	2	0.731
Male	7	2.5	189	68.2	81	29.3			
Female	18	3.6	340	67.1	149	29.3			
Marital Status							4.008	2	0.135
Single	3	2.7	84	75.7	24	24.6			
Married	22	3.3	445	66.1	206	30.6			
Family income							7.620	2	0.022
< 5,000 Baht	14	4.1	244	71.3	84	24.6			
5,000 Baht and above	11	2.5	285	64.5	146	33.0			
Occupation							0.499	2	0.779
Labor and employee	9	2.8	218	68.8	90	28.4			
Agriculturalist and others	16	3.4	311	66.6	140	30.0			
Educational levels							0.209	2	0.901
Never attained and primary school	19	3.0	422	67.6	183	29.3			
High school (1-6) and above	6	3.8	107	66.9	47	29.4			
Having children and elderly							7.062	2	0.029
No	10	6.6	100	65.8	42	27.6			
Yes	15	2.4	429	67.9	188	29.7			
Received information from media							14.163	2	0.001
No	4	12.5	25	78.1	3	9.4			
Yes	21	2.8	504	67.0	227	30.2			

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Table 18 Relationships between preventive avian influenza practices and socio-demographic variables (Cont).

Variables	Practices (N= 784)						Statistics		
	Low		Medium		High		χ^2	df	P
	n	%	n	%	n	%			
Raising poultry							80.415	2	< 0.001
No	16	3.6	353	79.9	73	16.5			
Yes	9	2.6	176	51.5	157	45.9			
Slaughtering poultry							10.187	2	0.006
No	21	3.6	411	70.0	155	26.4			
Yes	4	2.0	118	59.9	75	38.1			

The Analysis of Association of KAP (knowledge, attitudes and practices) about Avian Influenza

The following analysis displays the association of KAP (knowledge, attitudes and practices) about avian influenza, as shown in Tables 19-21.

Table 19 displays the levels of attitudes versus the levels of knowledge of the respondents. The proportion of the respondents who had the medium level of knowledge was higher than others who had positive attitudes. The association between the knowledge and the levels of attitudes was statistically significant ($p<0.05$).

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Table 19 Number and percentage distribution of respondents by the levels of attitudes versus the levels of knowledge.

Levels of knowledge	**Attitudes Levels**				Total	
	Negative		Positive			
	No.	%	No.	%	No.	%
Low	11	1.4	11	1.4	22	2.8
Medium	27	3.4	640	81.6	667	85.1
High	4	0.5	91	11.6	95	12.1
Total	42	5.4	742	94.6	784	100.0

χ^2 = 88.979, df = 2, Significance < 0.001

Table 20 displays the levels of practices versus the levels of attitudes of the respondents. The proportion of the respondents who had positive attitudes was greater than those who had negative attitudes to practices rightly about avian influenza prevention. The association between attitudes and practices was statistically significant (p<0.05).

Table 20 Number and percentage distribution of respondents by the levels of practices versus the levels of attitudes.

Levels of Attitudes	**Practices Levels**						Total	
	Low		Medium		High			
	No.	%	No	%	No	%	No.	%
Negative	7	0.9	24	3.1	11	1.4	42	5.4
Positive	18	2.3	505	64.4	219	27.9	742	94.6
Total	25	3.2	529	67.5	230	29.3	784	100.0

χ^2 = 26.132, df = 2, Significance < 0.001

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Table 21 presents the levels of knowledge versus the levels of practices of the respondents. The proportion of the respondents who had knowledge of avian influenza was more likely to have good practices to prevent avian influenza. However, the association between knowledge and practices was not statistically significant (p>0.05).

Table 21 Number and percentage distribution of respondents by the levels of knowledge versus the levels of practices.

Levels of Practices	**Knowledge Levels**						Total	
	Low		Medium		High			
	No.	%	No	%	No	%	No.	%
Low	2	0.3	22	2.8	1	0.4	25	3.2
Medium	17	2.2	449	57.3	63	8.0	529	67.5
High	3	0.4	196	25.0	31	4.0	230	29.3
Total	22	2.8	667	85.1	95	12.1	784	100.0

χ^2 = 6.323, df = 4, Significance 0.176

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4.2 Phase II: Action Research Process and Implementation

In this phase both qualitative and quantitative data collection were performed to describe socio-demographic characteristics of the study population.

The qualitative data collection was obtained by various methods including transect-walk, in-depth interview, and observation. These methods aimed to collect data about community infrastructure, socio-cultural and economic status of the community, environmental conditions, community activities about avian flu prevention and control measures, health care services and to obtain supportive activities from local authorities. The results of the study presented Vang Ta-Ku community's characteristics which related to background, location, ecological and physical characteristics, population, economy, society, culture, environmental sanitation and medicine and public health. As a result, we were able to understand the community as well as some foundations described factors related to prevent avian influenza infection in the study village.

Before the implementation the empowerment program would be applied to empower to the key community stakeholders. The researcher performed the qualitative data collection as a based line data of the study. The methods were used for data collection as follow:

1. Participant observation: the researcher participated with the community in several activities including:

1.1 Risk areas survey; transect-walk in risk area, domestic poultry reservoirs survey and observation.

1.2 Mapping of the village

1.3 Visiting houses

2. In-depth Interview: conducted among the leader group of the village in both formal and informal, and interviewed with 5 key informants by questions planned to find information about the history of the community, their lifestyle, basic social structure, political economic and social characteristics, culture and the possibilities of community empowerment.

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3. Informal interview: conducted in the target group without guideline questions and the interview were performed as a conversational between the interviews and respondents.

4.2.1 Community Diagnosis

Background and Location of the Village

Ban Vang Ta – Ku is a community located at Moo 8, Thung - Khok Sub-district, Song Phi Nong district, Suphan Buri province. It is approx 45 kms from Muang district and 15 kilometers from Song Phi Nong district. The total area of the community is 5,425 rai (a rai equals 40 m x 40 m.), where 850 rai belonged to residential area and 4,575 rai were for agricultural area. The village sketched map is shown in Figure 8.

Physical and Ecological Characteristics

Topography: The topography of Ban Vang Ta – Ku community is composed of basin and plain. Owing to this, most Ban Vang Ta – Ku villagers earn a living from rice cultivation and asparagus growing. Rice field of the community is divided into two parts: eastern and western.

Water supply: Most of the community areas are developed land where the rice field can be cultivated by the irrigation system through out the areas. Ban Vang Ta-Ku is suitable for agriculture all around the year. Most of people grow rice, asparagus, Rosella, and corns as each crops. The residential areas and water sources in Ban Vang Ta – Ku are shown in Figure 8.

Climate: Vang Ta – Ku climate is divided into three seasons as follows:

Summer season starts from February to May. The highest average temperature is in March and April. The average temperature is 30 degrees Celsius.

Rainy starts from June to mid October. Normally, it slightly rains at the beginning of the season, but not as heavy as during July to mid October.

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Cool season is between November to January. The period of lowest temperature falls in mid December. The average temperature is 28 degrees Celsius.

Transportation: At present, Ban Vang Ta-Ku community is very well accessible and has an asphalt paved road, namely "Vang Ta-Ku – Srisamran". It is the main link making many villages access to the town. This village doesn't have public transportation. Most villagers had to ride their owned automobile, motorcycle, or bicycles.

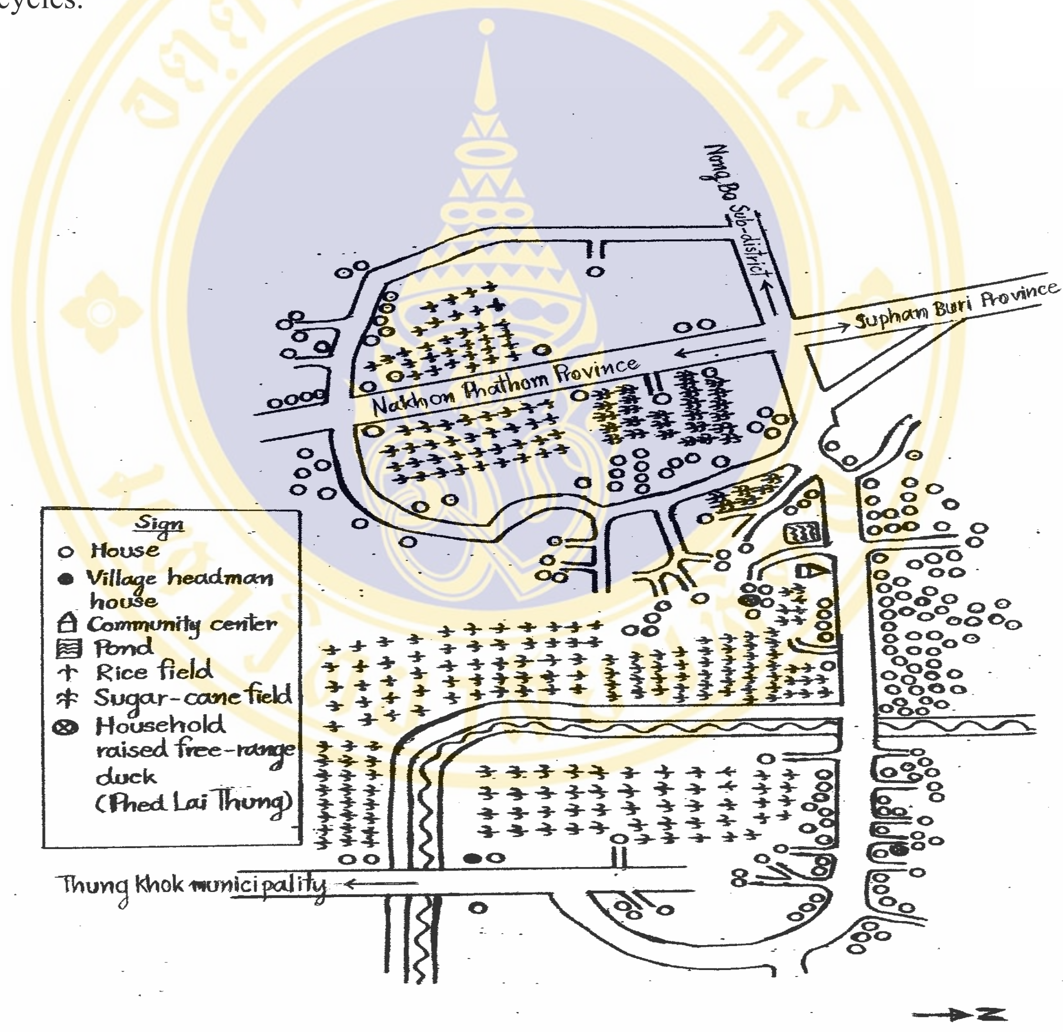

Figure 8 The sketched map of Van Ta-Ku village No. 8, Thung Khok Sub-district, Song Phi Nong District, Suphan Buri, Province.

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Vang Ta-ku villagers have connected to communication channels. These are:

Television. Most villagers had television set at home. Somebody join watching television with his or her kindred or neighbors mostly during 06.00 – 10.00 p.m. It is considerable for the most effective method to give information to villagers.

Village information center. The news tower center at Ban Vang Ta-Ku community was located at the house of the village headman to announce information/news to villagers.

Magazines, newspapers and other publications. Most of the villagers finished the primary school and only a few persons preferred reading regularly. Therefore, it might be a challenge to provide information on avian influenza through to the community via this channel.

Residential Areas

Housing. Generally villagers built their houses along the road close together like a cluster, each cluster of houses had a strong social and family ties. There were some marginal groups of villagers living far from the road. Most of houses had two storeyes raised on high poles where the people always worked and packed their stuff beneath the house.

Environmental Sanitation

Water for domestic uses. All households drank rainy water collected from the roof and stored in big jars. The jar might have no cover or have merely a zinc sheet to protect. Therefore, the water is not clean. Moreover, people drank water without boiling. Many villagers used tap water or bottled water for consumption.

Using latrine. All families in Vang Ta-Ku have and use latrine inside or outside the houses. New family will use the same latrine with their parents.

Garbage disposal. Most garbage was organic refuse and of course it is naturally digestible. Some garbage such as plastic debris were left and occasionally burnt.

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The culture of consumption. The consumption of Vang Ta-Ku villagers: Many kinds of foods were available at the local fresh markets, such as, vegetables, fish, pork, and chicken. Culturally, people were eating well-cooked foods from frying, boiling, or roasting. Very rare cases the people ate raw foods, such as raw fish or raw chicken meat. However, due to the modernize lifestyle, people did not have time to cook at home, instead, the preferred to buy ready-cooked foods from vendors or from the super market.

Religions and Beliefs

Most of villagers in Vang Ta-Ku were Buddhism. There was one family a Christian. Ban Vang Ta-Ku had no Buddhist temple, but only the one Chinese joss-house. Vang Ta-Ku villagers continued traditionally made the merit rites during the year at the Buddhist temple nearby the village. There were important traditional worships in Vang Ta-Ku village, such as *Bun Songkran Ruam Yard Deuan 5*, *Bun Kaw Pansa Deuan 8, Bun Aukpansa Deuan 11, and Bun Katin Deuan 12.* Besides, the temple was also the center of the rite that concerned with the lifestyle of villagers that's the status of individuals and kinship. The rite would make offerings to the dead relatives, *Bun Buat Nak* and the funeral. People believed in ghost as well. Thus, the folkways, tradition, rituals, and beliefs are usually related to Buddhism and the ghost.

Beliefs - Most of villagers believed in merit, sin, rebirth and ghost. However some misunderstood about avian influenza. In the past, most of Vang Ta-Ku villagers had traditional beliefs when their chicken were sick and dead by an unknown cause, they called it "*Ka - Lee" (Damn) sick*. Most of villagers would take dead chicken meat to cook for food. This belief caused a person in Vang Ta-Ku village got infected by avian influenza and died from eating dead chicken meat in 2004.

Medical and Public Health

Sickness and Health Care: At present, most of common disease incidences occurred among the villagers included hypertension, diabetes, and the digestive system, respectively.

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Villagers' Health Care: Use of modern medicine-in general, Vang Ta-Ku villagers' health care was provided with modern medicine from various sources as follows:

1) Government's health center (Ban Long Tong Health Center)
2) Stores in the community
3) Public health personnel's clinics located in sub-district
4) Private clinics in Song Phi Nong town, Suphan Buri province
5) District General hospital in Song Phi Nong

Despite a modern medicine was widely accepted, some villagers preferred to receive traditional healing such as herbs and spirit. At the time of study, some herbal medicines were famous in the community. Many people have their own preparations.

In conclusion, when villagers got sickness, they needed the modern medicine to cure. Traditional healing was only an alternative preference for ones who suffered from chronic disease.

Demographics

According to the survey on Vang Ta-Ku village's population in December 2004. The figure of population were 978 persons, with 470 males and 508 females living in 199 households. Its population density was averaged around 56 persons per a square kilometer.

Vang Ta-Ku had a low rate of immigration. Hence, aspects of the immigration will be examined.

History of the village. Dating back for 75 years ago; there were 5 families who were the first pioneers settled down in Ban Vang Ta-Ku and search for a new community. The people came from Dontoom district, Nakhon Phathom province and some were from sub-districts of Suphan Buri province. At the beginning of the settlement, the people gave the name of the village followed the name of a kind of tree "Ta Ku" wood.

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Economy

Earning a living: At the time of the study, the main agricultural products were rice, sugar cane, asparagus, vegetables, and other cash crops. Therefore, Vang Ta-Ku villagers earned a living by growing rice, asparagus, rosella and sugar cane. The majority of people in Ban Vang Ta-Ku were farmers made the production for the purposes of consuming and trading. Rice culturing process depends on agricultural technology methods such as an engine wheel plough, harvesting tractors, and rice graining machines. In addition, there were uses of chemical substances such as weed killers, pesticides, and fertilizers for agriculture. People planted rice in three seasons a year by using irrigation canals which supplied water all the year. Most of people in Vang Ta-Ku rented a land for growing rice and doing cash crops. The rate of the rent costed 1,000 baht per rai per year. Most of agriculturists had high liability. Therefore, to survive, people have to find some other sideline jobs. Besides, most villagers also had supplement careers such as raising domestic poultry, and being employed for daily wages.

Raising animals: Vang Ta-Ku inhabitants raised animals for a supplementary job. Those were pigs, native chicken, fighting roosters and ducks. The animal farms were scattered around the village. Most of the poultry were raised to supplement people's foods such as native chicken or ducks. Nobody raised animals for trade. Some people raised fighting roosters for game and gambling nearby the village. This was the way of life and the culture that might or might not involve with the spread of the disease.

Employment: Most of Vang Ta-Ku people were employed inside the village. There were shoes factory and animal farming. Some people worked in the factories nearby the village. The labor wages depended on the features and procedures of jobs for example, a wage per day for job in the factories was approximately 110 – 135 Baht, or about the rate of 120 – 150 Baht for unskilled employment.

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Socio-Economic Characteristics

Family and kinship: The villagers had more single families rather than expanded families. However, the relationship of families was in the form of kinship, as seen from the location of houses being clustered together.

They were likely to get married when they were young. Sometimes, if they got to work outside the village, they would get married with outsiders. However, most of them still abided by our old tradition in which the spouses come from approving of man of standing in their kinships. After the marriage, the matrilocal was held as culturally practiced when the bridegroom moved to stay with the bride's family. Until they had children, women's parents provided the land for their new family to settle down and then family would become a single one.

4.2.2 The results of analysis the sample groups

This phase emphasized on the empowerment of the key community stakeholders toward prevention and control of avian influenza in Ban Vang Ta-Ku. Both qualitative and quantitative data were collected. At the beginning and at the end of the study there were 24 key community members and 175 household representatives in the implement. The results of the analyses were presented in 4 parts:

Part 1: The results of analysis toward the key community members

1.1 Socio-demographic characteristics of the key community members

1.2 Levels of knowledge, attitudes and practices of avian influenza, hand washing with soap, self-efficacy, and necessary to prevent the disease.

1.3 Comparison of mean scores of KAP of avian influenza, hand washing with soap, and self-efficacy expectation and necessary for prevention the disease of the key community members between before and after implement program.

Part 2: The results of analysis toward the household representatives

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2.1 Socio-demographic characteristics of the household representatives

2.2 Comparison KAP on avian influenza between before and after implement program both in the key community members and household representatives group.

2.3 Level of knowledge, attitudes, and practices to prevent avian influenza, self-efficacy expectation, necessary perception for prevention of household representatives to implement avian influenza prevention and control in the study village.

2.4 Behaviors of hand washing of the respondents in the study village both before and after implement program.

2.5 Comparison of mean scores on knowledge, attitudes, and practices of avian influenza, hand washing with soap, perceived self-efficacy, and perceived necessary to prevent avian influenza between before and after implement program.

2.6 People's satisfaction to the research project and working with the key community members.

2.7 People's participation in the project activities of prevention and control avian influenza in the study village.

2.8 Self-esteem of the key community members and household representatives

2.9 The advantages and benefits of the project activities affecting the study village.

Part 1: The Analysis of Data in Group of the Key Community Stakeholders

1.1 Socio-demographic characteristics of the key community stakeholders

Most of the sample key community members aged between 35 to 56 years old, with the mean of 46 years old; 70.8% were male. Almost 80% finished 6 year-school and 79.2% were married. Less than half of them (45.8 %) were farmers and 37.5% were waged employees. Most of them have monthly income between 5,000 – 10,000 Baht per month (45.8 %). More than half of key community members raised poultry in their house (58.3 %). See detail in Table 22.

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Table 22 Number and percentage of the key community members by socio-demographic Variables.

Socio-demographic variables	Key community members (n = 24)	
	Number	Percentage
Gender		
Male	17	70.8
Female	7	29.2
Age (Year)		
15 – 31	3	12.5
32 – 48	6	25.0
49 – 65	15	62.5
Mean = 12.50 SD. = 27.590		
Education		
Never attended school	1	4.2
Primary school (1 -6)	19	79.2
Secondary and high school (1 – 6)	3	12.5
Bachelor degree	1	4.2
Marital status		
Single	2	8.3
Married	19	79.2
Window	2	8.3
Separated	1	4.2
Occupation		
Government officer	2	8.3
Waged employee	9	37.5
Agriculturalist	11	45.8
Trading	2	8.3
Family income		
< 5,000	9	37.5
5,000 - 10,000	11	45.8
10,001 – 15,000	2	8.3
> 15,000	2	8.3
Raising poultry		
No	10	41.7
Yes	14	58.3

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1.2 Level of Avian Influenza Knowledge, Attitudes and Practices, Self-efficacy, and Perceived Necessity to Prevent the Disease of the Key Community stakeholders.

Knowledge: It was found that more key community members increased knowledge after the program. In pretest, higher proportion was found in moderate level whereas in the posttest the higher proportion was the high level.

Attitudes: The proportion of key community members had high attitudes of pretest and posttest, 75.0 percent and 100.0 percent, respectively.

Practices: Higher proportion of key community members more up from moderate level (62.5 %) in pretest to high level in posttest (79.2 %).

Self-efficacy: The proportion of key community members highly perceived their self-efficacy on avian influenza prevention and control program in the community both in pretest and posttest 54.2 percent and 100.0 percent, respectively.

Perceived necessity: The proportion of key community members highly perceived necessity in prevention and control of avian influenza in the community both in pretest and posttest 54.2 percent and 100.0 percent, respectively.

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Table 23 Frequency and percentage distribution of key community members by degree of avian influenza KAP and other variables between before and after implementation.

Level of avian flu KAP	Pretest (n = 24)		Posttest (n = 24)	
	Number	Percent	Number	Percent
Knowledge				
High	10	41.7	23	95.8
Moderate	14	58.3	1	4.2
Low	-	-	-	-
Attitudes				
Positive	18	75.0	24	100.0
Not sure	6	25.0	-	-
Negative	-	-	-	-
Practices				
High	9	37.5	19	79.2
Moderate	15	62.5	5	20.8
Low	-	-	-	-
Self-efficacy				
High self-efficacy	13	54.2	24	100.0
Moderate self-efficacy	-	-	-	-
Low self-efficacy	11	45.8	-	-
Perceived necessity to prevention				
Very	13	54.2	24	100.0
Moderate	-	-	-	-
Less	11	45.8	-	-

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1.3 The Comparison of Difference of Avian Flu KAP, Self-efficacy on Behavioral Practices for Avian Flu Prevention and Control of the Key Communities both Pretest and Posttest of the Implement Program.

Knowledge about Avian Influenza

There were 18 questions about the knowledge of avian influenza with the actual possible range of scores 0-18. The sample key community members had the mean knowledge score in the pretest equal to 12.42 and the posttest 16.13, respectively. All knowledge variables of the implementation group were significantly changed during the post-study than the pre-study ($p < 0.001$).

Attitudes to Avian Influenza

There were 17 statements about attitudes toward avian influenza with the actual possible range of scores 17-51. The sample key community members had the mean attitudes score in the pretest equal to 41.38 and the posttest 48.04, respectively. The attitudes of the implementation group on avian influenza were significantly improved than the pre-study ($p < 0.001$).

Practices Behavior about Avian Influenza

There were 15 items about practices behavior to prevention and control of avian influenza with the actual possible range of scores 0-30. The sample key community members had the mean practices behavior score in the pretest equal to 18.04 and the posttest 22.88, respectively. Practices behaviors of the implementation group during the post-study were improved than the pre-study. Significant difference was found at p-value < 0.001.

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Perceptions on Self-efficacy for the Prevention and Control of Avian Influenza

There were 21 questions about the self-efficacy with the actual possible range of scores 0-42. The sample key community members had the mean perception score in pretest 12.42 and posttest 16.13, respectively. Perceptions on self-efficacy of the implementation group were significantly changed during the post-study than the pre-study at p-value < 0.001.

Perceptions of Necessity to Prevent and Control of Avian Influenza

There were 21 questions about the perception on necessary to prevention and control of avian influenza with the actual possible range of scores 1-63. The sample key community members had the mean perception score in the pretest equal to 45.63 and the posttest 59.50, respectively. When these mean scores were compared and tested, the statistical significant different was found at p-value 0.002.

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Table 24 Comparisons of differences of avian influenza KAP, self-efficacy on behavioral practices of the key community members between the pretest and posttest of the implement program.

Variables	N	Mean	S.D.	t-value	df	p-value
Avian flu knowledge						
Pretest	24	12.42	1.909	9.452	23	< 0.001
Posttest	24	16.13	1.569			
Attitudes toward avian flu						
Pretest	24	41.38	4.538	-6.564	23	< 0.001
Posttest	24	48.04	2.836			
Practices behavior about avian flu						
Pretest	24	18.04	3.368	-5.287	23	< 0 .001
Posttest	24	22.88	3.340			
Perceived Self-efficacy						
Pretest	24	12.83	4.208	33.835	23	< 0.001
Posttest	24	41.92	0.408			
Perceived necessary to prevention						
Pretest	24	45.63	17.480	3.468	23	0.002
Posttest	24	59.50	5.405			

Part 2: The Analysis of Data in Group of the Household Representatives

2.1 Socio-Demographic Characteristics of Household Representatives

The socio-demographic characteristics of the respondents are presented in Table 25. The respondents consisted of 86 males and 113 females aged between 15 to 65 years. About a half (50.8%) aged 32 – 48 years. The majority (76.4%) finished

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primary school and 75.4% were married. Almost all of respondents were Buddhists. Among the study populations, there was slightly variation between those who worked in agriculture and labor employment, 30.7% and 46.7%, respectively. The proportions of those who earned 5000 – 10,000 and who earned less than 5,000 Baht per month was a variation, 35.2% and 56.3%, respectively. Most of the respondents (74.9%) reported that they had elderly and/or children living in their houses. Most (44.2%) chose public health center for their health care service. Approximately three fourths of them (74.9%) spent time for traveling to the health care service 10 – 30 minutes. Slightly more than two-thirds of them (69.8%) took motorcycle for traveling to the health care service. Almost all study samples had their own houses (90.5%). Almost of them (46.7%) were the head of household and 28.6% were the housewife. Almost of respondents (90.5%) received avian influenza information through television (83.9%). More than 90% of respondents collected and burned disposal garbage.

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Table 25 Number and percentage of respondents by demographic variables:

Socio-demographic variables	Number (N = 199)	Percentage
Gender		
Male	86	43.2
Female	113	56.8
Age (years)		
15 – 31	49	24.6
32 – 48	101	50.8
49 – 65	49	24.6
$\bar{X}$ = 46.23 , S.D. = 16.05		
Educational Level		
Never attended school	11	5.5
Primary school (1-6)	152	76.4
Secondary and high school (1-6)	29	14.6
Diploma	1	0.5
Bachelor Degree	6	3.0
Marital Status		
Single	31	15.6
Married	150	75.4
Widowed	15	7.5
Separated	3	1.5
Religion		
Buddhist	198	99.5
Christian	1	0.5
Primary Job		
Unemployed	7	3.5
Government officer	4	2.0
Waged employee	93	46.7
Agriculturalist	61	30.7
Student	6	3.0
Housewife	8	4.0
Trade	18	9.0
Others	2	1.0.

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Table 25 Number and percentage of respondents by demographic variables (Cont).

Socio-demographic variables		Number (N = 199)	Percentage
Monthly Family Income			
	< 5,000	112	56.3
	5,000 – 10,000	70	35.2
	10,000 – 15,000	7	3.5
	> 15,000	10	5.0
Having elderly and/or children 0 – 15 years old			
	Yes	149	74.9
	No	50	25.1
Place of receiving health care service			
	Public Health Center	88	44.2
	Public Hospital	82	41.2
	Private medical physician	15	7.5
	Pharmacy	7	3.5
	Private Hospital	5	2.5
	Others	2	1.0
Time of travel to the health care service			
	< 10 minutes	11	5.5
	10 – 30 minutes	149	74.9
	31 – 60 minutes	32	16.1
	> 60 minutes	7	3.5
Types of transportation			
	Motorbike	139	69.8
	Private car	48	24.1
	Public car	7	3.5
	Walking	3	1.5
	Bicycle	1	0.5
	Others	1	0.5
House Owner	Yes	180	90.5
	No	19	9.5

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Table 25 Number and percentage of respondents by demographic variables (Cont).

Socio-demographic variables		Number (N = 199)	Percentage
Status in the family	Head of household	93	46.7
	Wife	57	28.6
	Son or daughter	35	17.6
	Kindred	6	3.0
	Son or daughter-in-law	4	2.0
	Parents	4	2.0
Received information about avian influenza			
	Yes	180	90.5
	No	19	9.5
Sources of information			
	T.V.	167	83.9
	Health worker	56	28.1
	Newspaper	56	28.1
	Radio	61	30.7
	Magazine	2	1.0
	Lover	3	1.5
	Village Health Volunteers	42	21.1
	Kindred	8	4.0
	Friend	17	8.5
	Others	8	4.0
Method of garbage disposal			
	Collected and burned	184	92.5
	Collected and picked up by TAO/municipality	4	2.0
	Collected and buried	5	2.5
	Put on ground	1	0.5
	Collected and heap	3	1.5
	Dumped into the canal	2	1.0

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Table 26 displays number and percentage of respondents who raised poultry and history of touching the poultry contacting. A proportion of 40.2% raised poultry in their house areas. All of them didn't have poultry farm. The majority of the poultry raised (80.0%) were native (domestic) chicken.

Slightly less than two-thirds (63.0%) of the people raised 1- 20 native chicken per household and more than 70% raised them in the house yard. More than two-thirds (68.8%) of those who raised native chicken had seldomly contacted the fowl. The respondent themselves (70.3%) took care and fed their poultry flocks, at the same time, they were the risk group who always exposed to animal secretions.

Twenty of the respondents raised fighting roosters. Seventeen of them raised 1 - 17 roosters per house and half (50.0%) raised in the surrounding yards. Among those who raised roosters 55.0% contacted them every day. About 70.0% of the respondents accepted that they owned the roosters.

Three respondents raised duck flocks. The number of ducks raised varied from 1,000– 1,500 in number. Approximately two-thirds (66.7%) were the free-range duck (Phed Lai Thung) raising method. Probably these farmers did not contact the ducks often (66.7%). Only a third of the respondents and their family members were taking of the duck flocks and they accepted that they were contaminated with duck mess.

Only one respondent reported raising geese. There were only eight geese raised. The people not always contacted the geese and they raised they lived freely around the respondent's house.

It was found that five respondents raised other kinds of bird (e.g. turtledove, mynas). Eighty percent raised about 1 – 4 birds in the house or kept them in a coop or a cage. Eighty percent of them had never contacted their birds. Except two of the family's respondents (40.0%) had experienced closed in touch with their bird.

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Table 26 Number and percentage of respondents by methods of poultry raised.

Method of Poultry Raised		Number (N = 199)	Percentage
Raising poultry in household			
	Yes	80	40.2
	No	119	59.8
Raising in farm	Yes	0	00.0
	No	119	100.0
Type of poultry raised (multiple answers)			
	Native chicken	64	80.0
	Fighting roosters	20	25.0
	Duck	3	3.8
	Geese	1	1.3
	Others	5	6.3
1. Number of native chicken raised (n = 64)			
	1 - 20	51	79.7
	21 – 40	10	15.6
	41 – 60	3	4.7
	Min = 1, Max = 60		
1.1 Places of raising native chicken			
	House yard	47	73.4
	Coop/cage	14	21.9
	Open farm	2	3.1
	Closed farm	1	1.6
1.2 Frequency of contact with native chicken			
	Everyday	4	6.2
	Sometimes	8	12.5
	Seldom	44	68.8
	Never	8	12.5

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Table 26 Number and percentage of respondents by methods of poultry raised (Cont).

Method of Poultry Raised	Number (N = 199)	Percentage
1.3 Family member exposed the native chicken (multiple answers)		
Oneself	45	70.3
Spouse	16	25.0
Children	4	6.3
Parents	5	7.8
Others	10	15.6
2. Number of raised fighting roosters (n = 20)		
1 – 17	14	70.0
18 – 34	4	20.0
35 – 51	2	10.0
Min = 1, Max = 50		
2.1 Places of raising fighting roosters		
House yard	10	50.0
Coop/cage	10	50.0
2.2 Frequency of contact with the fighting roosters		
Daily	5	25.0
Sometimes	3	15.0
Seldom	11	55.0
Never	1	5.0
2.3 Family member exposed the fighting roosters (multiple answers)		
Myself	14	70.0
Spouse	6	30.0
Children	3	15.0
Parents	1	5.0
Others	4	20.0

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Table 26 Number and percentage of respondents by methods of poultry raised (Cont).

Method of Poultry Raised	Number (N = 199)	Percentage
3. Number of duck (n = 3)		
40	1	33.3
1,000-1,500	2	66.7
Min = 40, Max = 1,500		
3.1 Places of raising the ducks		
House yard	1	33.3
Free-range raising	2	66.7
3.2 Frequency of contact with the ducks		
Daily	1	33.3
Never	2	66.7
3.3 Family member exposed the ducks (multiple answers)		
Myself	1	33.3
Parents	1	33.3
Children	1	33.3
4. Number of geese (n = 1)		
8	1	100.0
4.1 Places of raising the goose		
House yard	1	100.0
4.2 Frequency of contact with the goose		
Seldom contact	1	100.0
4.3 Family member exposed the geese (multiple answers)		
Others	1	100.0

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Table 26 Number and percentage of respondents by methods of poultry raised (Cont).

Method of Poultry Raised	Number (N = 199)	Percentage
5. Number of others poultry (n = 5)		
1 - 2	4	80.0
3 thru highest	1	20.0
Min = 1, Max = 3		
5.1 Places of raising the other poultry		
Coop/cage	5	100.0
5.2 Frequency of contact with the other poultry		
Seldom	1	20.0
Never	4	80.0
5.3 Family member exposed the other poultry (multiple answers)		
Myself	2	40.0
Spouse	2	40.0
Children	1	20.0

Table 27 illustrates respondents who slaughtered poultry for consuming in their families. It was found that many of the study population (68.8%) preferred purchase the poultry meat rather than to kill their chicken. They liked to go to the fresh market in the municipality (84.9%). Thirty percent of the respondents slaughtered their fowl for consuming and very few of them used safeguards to protect from contamination (3.2 %). It was observed that more than a half of those who slaughtered the poultry were the respondents themselves (53.2%). The place they slaughtered the poultry was in the house yard (61.3%). The way they slaughtered was by cutting the neck (100.0%), and 35.5% selected to disposed the waste of poultry by burning, and 58.1% by burying, respectively.

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Table 27 Number and percentage of respondents consumed poultry meat in their family.

Killing poultry for consuming	Number (N = 199)	Percentage
Places to purchase poultry		
Fresh market in municipality	169	84.9
Meat shops in the village	6	3.0
Super market	1	0.5
Sunday market in the village	23	11.6
Slaughtered poultry for consuming		
Yes	62	31.2
No	137	68.8
Wore personal protective safeguards		
Yes	2	3.2
No	60	96.8
Person slaughtered poultry for consuming (n = 62)		
Myself	33	53.2
Brother or sister	7	11.3
Parents	10	16.1
Son/daughter	1	1.6
Others	11	17.8
Place to slaughter poultry		
House Yard	38	61.3
Kitchen	17	27.4
Be neath	2	3.2
Others	5	8.1
Method of killing poultry		
Cut the neck	62	100.0
Disposed of the waste/carcass		
Burnt	22	35.5
Buried	36	58.1
Threw in to the yard	3	4.8
Fed animals	1	1.6

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2.2 Comparison of KAP on avian influenza before and after experimental program in both the key communities and household representatives group

Table 28 shows the comparisons of the knowledge distribution of percents regarding avian influenza of household representatives and the key community members between pre-test and post-test ot the study. When considering each item in each group, we noted that not all of them correctly knew avian influenza.

In the pre-test, the group of household representatives, we found that more than 80% knew that: (1) Modes of transmission of avian influenza, namely person who ate uncooked meat of dead chicken or contacted dead chicken, (2) The highest risk of avian influenza was a direct contact to infected or dead fowl as well as an eating dead chicken meat, (3) Children and elderly were the highest susceptibility to get infection from avian influenza in the contaminated area, (4) Preventive method of avian influenza infection was not to contact sick or dead chicken (93.7%), (5) Wearing safeguards when contacted sick chicken (93.1%), (6) Wearing safeguard when contacted carcass (93.7%), (7) Avian influenza could cause illness and fatality (90.3%), (8) Highest risk was a direct contact of an infected or dead animal as well as eating dead chicken meat (90.3%), (9) People who contacted poultry were risk to avian influenza (90.9%). Only 34.3%, 27.4%, and 22.3% of them knew that the major signs and symptoms of avian influenza, causative agent of avian influenza, and the vaccination for poultry involved with mutation of avian influenza virus, respectively. However, all of them (100%) didn't know that the avian influenza (H5N1) might not transmit from person to person. In the post-test we found that the proportion of household representatives, who correctly answered, increased in every item. However, there were 66.3% did not know that the avian influenza (H5N1) could not transmit from person to person.

In group of the key community stakeholders, the pre-test we assessed and found that more than 90% knew that: (1) Modes of transmission of avian influenza**;** person who ate uncooked meat of dead chicken or contact dead chicken, (2) Indirect contact to secretion of infected animal**,** (3) The highest risk of avian influenza was a direct contact to infected or dead animal as well as an eating dead chicken meat**,** (4) Avian influenza could cause illness and fatality, (5) Preventive method of avian

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influenza infection was not to contact to sick or dead chicken, (6) Wearing safeguards when contacting sick chicken, (7) People who contacted poultry were at risk to avian influenza. However, all of them (100%) did not know that the avian influenza (H5N1) could not transmit from person to person. After the implementation program we did post-test assessment and found that 66.7% did not know that the avian influenza (H5N1) could not transmit from person to person. However, most of them increased the knowledge in all items after the implementation. The items that all of them (100%) knew were: (1) Modes of transmission of avian influenza**:** Direct contact to avian or infected animal**,** (2) Persons who ate uncooked meat of dead chicken or contacted dead chicken, (3) The highest risk of avian influenza was a direct contact of infected or dead animal as well as an eating dead chicken meat**,** (4) Avian influenza could cause illness and fatality, (5) Preventive method for avian influenza infection is not to contact to sick or dead chicken, (6) Wearing safeguards when contacting sick chicken, (7) Wearing safeguards when contacting animal carcasses, (8) Highest risk is a direct contact to infected or dead animal as well as an eating dead chicken meat, and (9) People who contacted poultry were at risk of avian influenza.

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Table 28 Comparison of knowledge regarding avian influenza between the household representatives and the key community members before and after implementation program.

Knowledge on avian influenza	Respondents (N=175)				Key communities (N = 24)			
	Pretest		Posttest		Pretest		Posttest	
	No.	%	No.	%	No	%	No	%
1. Mention major signs and symptoms of avian influenza.								
Correct	60	34.3	101	57.7	8	33.3	21	87.5
Incorrect	115	65.7	74	42.3	16	66.7	3	12.5
2. Able to state causative agent of avian influenza	48	27.4	117	66.9	9	37.5	22	91.7
Correct	127	72.6	58	33.1	15	62.5	2	8.2
Incorrect								
3. Modes of transmission of avian influenza: Direct contact of avian or infected animal								
Correct	122	69.7	151	86.3	21	87.5	24	100.0
Incorrect	53	30.3	24	13.7	3	12.5	0	0.0
4. Persons eat uncooked meat of dead chicken or contact dead chicken are at risk.								
Correct	142	81.1	165	94.3	23	95.8	24	100.0
Incorrect	33	18.9	10	5.7	1	4.2	0	0.0
5. Indirect contact of secretion of infected animals.								
Correct	129	73.3	156	89.1	23	95.8	23	95.8
Incorrect	46	26.3	19	10.9	1	4.2	1	4.2
6. Avian influenza can transmit from person to person.								
Correct	0	0.0	59	33.7	0	0.0	8	33.3
Incorrect	175	100.0	116	66.3	24	100.0	16	66.7
7. Avian influenza can be transmitted from poultry to man.	105	60.0	141	80.6	12	50.0	21	87.5
Correct	70	40.0	34	19.4	12	50.0	3	12.5
Incorrect								
8. Avian influenza is a communicable disease.	101	57.7	131	74.9	8	33.3	21	87.5
Correct	74	42.3	44	25.1	16	66.7	3	12.5
Incorrect								
9. The highest risk of avian influenza was a direct contact of infected or dead animal as well as an eating of dead chicken meat.								
Correct	148	84.6	168	96.0	23	95.8	24	100.0
Incorrect	27	15.4	7	4.0	1	4.2	0	0.0
10. Avian influenza can be treated.								
Correct	100	57.1	138	78.9	12	50.0	20	83.3
Incorrect	75	42.9	37	21.1	12	50.0	4	16.7

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Table 28 Comparison of knowledge regarding avian influenza between respondents and the key community members before and after implementation program (Cont).

Knowledge on avian influenza	Respondents (N=175)				Key communities (N = 24)			
	Pretest		Posttest		Pretest		Posttest	
	No.	%	No.	%	No.	%	No.	%
11. Avian influenza can cause illness and death.								
Correct	158	90.3	174	99.4	23	95.8	24	100.0
Incorrect	17	9.7	1	0.6	1	4.2	0	0.0
12. Prevention method for avian influenza infection is not to contact to sick or dead chicken.								
Correct	164	93.7	169	96.6	22	91.7	24	100.0
Incorrect	11	6.3	6	3.4	2	8.3	0	0.0
13. Wearing safeguard when contacting chicken.								
Correct	163	93.1	170	97.1	23	95.8	24	100.0
Incorrect	12	6.9	5	2.9	1	4.2	0	0.0
14. Wearing safeguards when contacting to carcass.								
Correct	164	93.7	171	97.7	21	87.5	24	100.0
Incorrect	11	6.3	4	2.3	3	12.5	0	0.0
15. Children and elderly are the highest susceptibility to infect avian influenza in the contaminated area.								
Correct	143	81.7	144	82.3	20	83.3	21	87.5
Incorrect	32	18.3	31	17.7	4	16.7	3	12.5
16. Highest risk is a direct contact to infected or dead animal as well as an eating dead chicken meat.								
Correct	158	90.3	169	96.6	22	91.7	24	100.0
Incorrect	17	9.7	6	3.4	2	8.3	0	0.0
17. Vaccination for poultry affects mutation of avian influenza virus.								
Correct	39	22.3	113	64.6	5	20.8	21	87.5
Incorrect	136	77.7	62	35.4	19	79.2	3	12.5
18. People who contact the poultry are risk to avian influenza.								
Correct	159	90.9	169	96.6	23	95.8	24	100.0
Incorrect	16	9.1	6	3.4	1	4.2	0	0.0

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Table 29 shows distribution of number and percentage of household representatives and key community stakeholders and their attitudes toward avian influenza between the pretest of the posttest of implementation. Seventeen items were assessed whether there were changes. In the pretest of the household representatives, it was found that more than 90% agreed with the statements: (1) Avian influenza could be prevented, (2) Eating sick or dead chicken meat was a risk to avian influenza, (3) People who ate uncooked dead chicken or contact to dead chicken could cause avian influenza, (4) People who contacted the poultry were more likely than who never contacted the poultry to get avian influenza infection, (5) People who got common cold with high fever, chill, sore throat, cough, and fatigue that might be symptoms of avian influenza. (6) Hand washing with soap after contacting with poultry could prevent avian influenza, (7) Consumption of fully cooked chicken and egg could protect the infection, (8) Children and elderly or immune suppressing were susceptible to get infection easier than those with healthy persons, (9) People who raised fighting roosters and had close contact especially to contaminated areas were the population at risk to get infection from avian influenza, (10) Wearing personal protective safeguards while working in the poultry farm or disposing animals carcasses could protect the infection, (11) Housewives and chefs played an important role in the prevention of avian influenza and they must cooked properly, and always be sanitized. In contrast, more than 50% of household representatives disagreed with the statements of: (1) At present, you are at risk of avian influenza, and (2) At present, your family members are at risk of avian influenza.

In the posttest, we found that more than 90% of household representatives had positive attitudes to prevent and control avian influenza. They agreed with the statements: (1) Avian influenza could be prevented, (2) Eating sick or dead chicken were at risk of avian influenza, (3) People who ate uncooked dead chicken meat or contacted to dead chicken could cause avian influenza, (4) People who contacted poultry were more likely than those who never contacted poultry to get avian influenza infection, (5) People who got common cold with high fever, chill, sore throat, cough, and fatigue might develop avian influenza, (6) Hand washing with soap after contacting poultry could prevent avian influenza, (7) Consumption of fully cooked chicken and eggs could protect the infection, (8) Children and elderly or who with

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immune suppressing were susceptible to get infection easier than who were healthy adults, (9) People who raised fighting roosters and had close relationship especially with contaminated areas were the population at risk to be infected from avian influenza, (10) Wearing personal protective safeguards while working in the poultry farm or disposing carcasses could protect the infection, (11) Housewives and chefs played an important role in the prevention and they must had proper cook, and always be hygienic (100%), (12) The confirmed infectious poultry would be immediately destroyed to prevent the spread of the disease, (13) When have domestic poultry got sick and died with unknown cause more than one in a day, people must informed the livestock officer to take a test and destroy, and (14) Relatives or persons who had close relationship with a patient with high fever, chill, sore throat and cough, must kept out of contact the mucous and saliva of the patient.

When assessed the pre test with the key community group, it was found that more than 70% of them agreed with the statements: (1) Avian influenza could be prevented, (2) Eating sick or dead chicken was risky to avian influenza, (3) People who ate uncooked meat of dead chicken or contact to dead chicken might get avian influenza, (4) People who contacted poultry were more likely than those who never contacted poultry to get avian influenza infection, (5) Hand washing with soap after contacting to poultry could prevent the avian influenza, (6) Children and elderly with immune suppressing were susceptible to get infection easier than were the healthy persons, (7) Wearing personal protective safeguards while working in poultry farm or disposing carcass could protect the infection, (8) The confirmed infectious poultry with avian influenza would be immediately destroyed to prevent the spread of the disease, and (9) When having domestic poultry got sick and died with unknown cause more than one in a day, people must informed the livestock officer to take a test and destroy. In contrast, more than 50% of key community stakeholders disagreed with the statements of: (1) At present, you are at risk of avian influenza, and (2) At present, your family members are at risk of avian influenza.

In post-test of the key community group assessment, we noted that all of them (100%) agreed with the statements of: (1) Avian influenza could be prevented, (2) Eating sick or dead chicken were risk of avian influenza, (3) People who ate uncooked meat of dead chicken or contacted to dead chicken could develop avian

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influenza, (4) People who contacted poultry were more likely than those who never contacted the poultry to get avian influenza infection, (5) People who got common cold with high fever, chill, sore throat, cough, and fatigue might develop the avian influenza, (6) Consumption of well cooked chicken meat and eggs could prevent the infection, (7) Children and elderly or immune suppressing were susceptible to get infection easier than were the healthy persons, (8) Wearing personal protective safeguards while working in poultry farm or disposing carcasses could protect the infection of the avian influenza, (9) Housewives and chefs played an important role in the prevention of avian influenza and they must had well done cook, and always be hygienic, (10) The confirmed infectious poultry with avian influenza would be immediately destroyed to prevent the spread of avian influenza infection., (11) When there had domestic poultry got sick and died from unknown cause more than one in a day, villagers must informed the livestock officer to take a test and destroy, and (12) Relatives or persons having close relationship to patient who had high fever, chill, sore throat and cough, must not contacted a mucous and saliva of the patient. Whereas, 50% of the key community stakeholders disagreed with those of: (1) At present, you are at risk of avian influenza, and (2) At present, your family members are at risk of avian influenza.

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Table 29 Comparison of attitudes regarding avian influenza between the respondents and key community stakeholders before and after implementation program.

Attitudes regarding avian influenza	Respondents (N = 175)				Key communities (N = 24)			
	Pretest		Posttest		Pretest		Posttest	
	No.	%	No.	%	No	%	No	%
1. You are concerning to the avian influenza.								
Agreed	122	69.7	130	74.3	3	12.5	15	62.5
Not sure	12	6.9	4	2.3	15	62.5	1	4.2
Disagreed	41	23.4	41	23.4	6	25.0	8	33.3
2. Avian influenza can be prevented.								
Agreed	158	90.3	170	97.1	17	70.8	24	100.0
Not sure	12	6.9	3	1.7	7	29.2	0	0.0
Disagreed	5	2.9	2	1.1	0	0.0	0	0.0
3. Eating sick or dead chicken meat is a risk of avian influenza.								
Agreed	161	92.0	173	98.9	20	83.3	24	100.0
Not sure	12	6.9	2	1.1	4	16.7	0	0.0
Disagreed	2	1.1	0	0.0	0	0.0	0	0.0
4. People who eat uncooked dead chicken meat or contact to dead chicken will get avian influenza.								
Agreed	158	90.3	172	98.3	18	75.0	24	100.0
Not sure	15	8.6	3	1.7	6	25.0	0	0.0
Disagreed	2	1.1	0	0.0	0	0.0	0	0.0
5. People who contact poultry, killing, selling, transferring, disposing carcass, children playing with poultry, are more likely to get avian influenza infection than people who have never contacted the poultry.								
Agreed	163	93.1	169	96.6	17	70.8	24	100.0
Not sure	11	6.3	6	3.4	7	29.2	0	0.0
Disagreed	1	0.6	0	0.0	0	0.0	0	0.0
6. People who get common cold with high fever, chill, sore throat, cough, and fatigue may develop avian influenza.								
Agreed	108	61.7	158	90.3	3	12.5	24	100.0
Not sure	50	28.6	15	8.6	21	87.5	0	0.0
Disagreed	17	9.7	2	1.1	0	0.0	0	0.0

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Table 29 Comparison of attitudes regarding avian influenza between the respondents and key community stakeholders before and after implementation program (Cont).

Attitudes regarding avian influenza	Respondents (N=175)				Key communities (N=24)			
	Pretest		Posttest		Pretest		Posttest	
	No.	%	No.	%	No	%	No	%
7. Hand washing with soap after contact with poultry could prevent the avian influenza.								
Agreed	150	85.7	163	93.1	18	75.0	23	95.8
Not sure	16	9.1	10	5.7	6	25.0	0	0.0
Disagreed	9	5.1	2	1.1	0	0.0	1	4.2
8. Consumption of well cooked chicken meat and eggs can prevent the infection of the avian influenza.								
Agreed	168	96.0	170	97.1	1	4.2	24	100.0
Not sure	7	4.0	4	2.3	23	95.8	0	0.0
Disagreed	0	0.0	1	0.6	0	0.0	0	0.0
9. Children and elderly or immune suppressing are susceptible to infection easier than are the normal persons.								
Agreed	161	92.0	167	95.4	19	79.2	24	100.0
Not sure	11	6.3	6	3.4	5	20.8	0	0.0
Disagreed	3	1.7	2	1.1	0	0.0	0	0.0
10. People who raise fighting roosters and have close association especially with contaminated areas are population at risk to avian influenza.								
Agreed	164	93.7	157	89.7	16	66.7	22	91.7
Not sure	9	5.1	15	8.6	7	29.2	2	8.3
Disagreed	2	1.1	3	1.7	1	4.2	0	0.0
11. Wearing mask, gloves, goggle and boot while working in poultry farm or disposing animal carcass can protect infection of avian influenza.								
Agreed	166	94.9	172	98.3	20	83.3	24	100.0
Not sure	8	4.6	2	1.1	4	16.7	0	0.0
Disagreed	1	0.6	1	0.6	0	0.0	0	0.0

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Table 29 Comparison of attitudes regarding avian influenza between the respondents and the key community before and after implementation program (Cont).

Attitudes regarding avian influenza	Respondents (N=175)				Key communities (N=24)			
	Pretest		Posttest		Pretest		Posttest	
	No.	%	No.	%	No	%	No	%
12. Housewives and chefs play an important role in the prevention of avian influenza. They must do well cook, and always.								
Agreed	161	92.0	175	100.0	15	62.5	24	100.0
Not sure	8	4.6	0	0.0	8	33.3	0	0.0
Disagreed	6	3.4	0	0.0	1	4.2	0	0.0
13. At present, you are at risk of avian influenza.								
Agreed	35	20.0	104	59.4	1	4.2	11	45.8
Not sure	31	17.7	24	13.7	10	41.7	1	4.2
Disagreed	109	62.3	47	26.9	13	54.2	12	50.0
14. At present, your family is members at risk of avian influenza?								
Agreed	37	21.1	103	58.9	4	16.7	11	45.8
Not sure	35	20.0	26	14.9	7	29.2	1	4.2
Disagreed	103	58.9	46	26.3	13	54.2	12	50.0
15. The positive poultry with avian influenza will be immediately destroyed to prevent the spread out of avian influenza infection.								
Agreed	155	88.6	168	96.0	19	79.2	24	100.0
Not sure	13	7.4	3	1.7	5	20.8	0	0.0
Disagreed	7	4.0	4	2.3	0	0.0	0	0.0
16. When there are domestic poultry get sick and died with unknown cause more than one in a day, people must inform the livestock officer to take a test and destroy.								
Agreed	152	86.9	169	96.6	17	70.8	24	100.0
Not sure	20	11.4	3	1.7	7	29.2	0	0.0
Disagreed	3	1.7	3	1.7	0	0.0	0	0.0
17. Relatives or persons who have close relationship with patient who have high fever, chill, sore throat and cough, they must not contact mucous and saliva of patient.								
Agreed	134	76.6	168	96.0	3	12.5	24	100.0
Not sure	32	18.3	6	3.4	21	87.5	0	0.0
Disagreed	9	5.1	1	0.6	0	0.0	0	0.0

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Table 30 shows number and percentage of household representatives and key community stakeholders regarding their practices, both in the pretest and post-test investigation. There were 15 items tested for the practices toward avian influenza. In the pretest for the household representatives, it was found that more than 70% of them practices regularly with the activities: (1) When they and their family members got sick from common cold, high fever, chill, sore throat, and cough, they immediately went to see physician or health worker every time, especially during the outbreak of the disease, (2) They kept a close look at children and warning them not to handle any chicken, birds, and any carcasses, (3) People always ate well cooked chicken meat and eggs (4) They always cooked food properly before eating, (5) They could properly practice themselves following the regulations of avian influenza prevention by washing hand with soap before eating food, eating well cooked food, not contacting directly to sick and dead chicken, and (6) Their family members could properly practice themselves following the regulations of the avian influenza prevention. In contrast, more than 70% of household representatives had no practices with the following activities: (1) Purchasing only chicken meat and chicken products from the food inspected shops, (2) Purchasing sick chicken with signs of cyanosis, ruffled feathers, snivel, diarrhea etc., or dead chicken slaughtered for sale, and (3) eating soft-boiled or raw eggs.

In the post-test of practices assessment of the household representatives, we noted that more than 90% of them practiced all time with the following activities: (1) When they and their family members got sick from common cold, high fever, chill, sore throat, and cough, they immediately went to see physician or health worker every time, especially during the outbreak of the disease, (2) People always ate well cooked chicken meat and eggs (4) They always cooked food properly before eating, (3) They always cooked food properly before eating, (4) They could properly practice themselves following the regulations of avian influenza prevention by washing hand with soap before eating food, eating well cooked food, not contacting directly to sick and dead chicken, and (5) Their family members could properly practice themselves following the regulations of the avian influenza prevention. However, more than 70% of household representatives had no practices with the following activities: (1) Purchasing only chicken meat and chicken products from the food inspected shops, (2)

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Purchasing sick chicken with signs of cyanosis, ruffled feathers, snivel, diarrhea etc., or dead chicken slaughtered for sale, and (3) eating soft-boiled or raw eggs.

In the pre test analyses of the key community group, it was found that more than 90% of them practiced regularly with the following activities: (1) People always ate well cooked chicken meat and eggs, (2) They always cooked food properly before eating, (3) They could properly practice themselves following the regulations of avian influenza prevention by washing hand with soap before eating food, eating well cooked food, not contacting directly to sick and dead chicken, and (4) Their family members could properly practice themselves following the regulations of the avian influenza prevention. In contrast, more than 90% of household representatives had no practices with the following activities: (1) Purchasing sick chicken with signs of cyanosis, ruffled feathers, snivel, diarrhea etc., or dead chicken slaughtered for sale, and (2) eating soft-boiled or raw eggs (100%).

In post-test evaluation of the key community group, it is to present that more than 90% of them practiced regularly with the following activities: (1) When they and their family members got sick from common cold, high fever, chill, sore throat, and cough, they immediately went to see physician or health worker every time, especially during the outbreak of the disease, (2) They advised their family members when they got common cold to prevent spread of disease to other persons (100%), (3) People always ate well cooked chicken meat and eggs (4) They always cooked food properly before eating, (5) They could properly practice themselves following the regulations of avian influenza prevention by washing hand with soap before eating food, eating well cooked food, not contacting directly to sick and dead chicken, and (6) Their family members could properly practice themselves following the regulations of the avian influenza prevention. In contrast, more than 80% of key community stakeholders had no practices with the following activities: (1) Purchasing sick chicken with signs of cyanosis, ruffled feathers, snivel, diarrhea etc., or dead chicken slaughtered for sale, and (2) eating soft-boiled or raw eggs.

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Table 30 Number and percent distribution of practices regarding avian influenza between the respondents and the key community members before and after implementation program.

Practices regarding avian influenza	Respondents (N=175)				Key community members (N=24)			
	Pretest		Posttest		Pretest		Posttest	
	No.	%	No.	%	No	%	No	%
1. Do you purchase only chicken meat and chicken products from the inspected shops?								
Regularly	23	13.1	7	4.0	4	16.7	2	8.3
Sometimes	36	20.6	43	24.6	4	16.7	7	29.2
No practice	116	66.3	125	71.4	16	66.7	15	62.5
2. Do you immediately go to see physician or health worker when you get common cold, high fever, chill, sore throat, and cough, especially during the disease outbreak in poultry flocks?								
Regularly	120	68.6	145	82.9	16	66.7	22	91.7
Sometimes	34	19.4	23	13.1	8	33.3	2	8.3
No practice	21	12.0	7	4.0	0	0.0	0	0.0
3. Do you immediately take your family members who get common, high fever, chill, sore throat, and cough to the physician or health worker, especially during the disease outbreak in poultry flocks?								
Regularly	128	73.1	146	83.4	18	75.0	23	95.8
Sometimes	33	18.9	22	12.6	6	25.0	1	4.2
No practice	14	8.0	7	4.0	0	0.0	0	0.0
4. Do you advise your family members when they get common cold to prevent spread of disease to other persons?								
Regularly	70	40.0	159	90.9	12	50.0	24	100.0
Sometimes	59	33.7	10	5.7	9	37.5	0	0.0
No practice	46	26.3	6	3.4	3	12.5	0	0.0
5. Do you purchase sick chicken with signs of cyanosis, ruffled feathers, snivel, diarrhea etc., or dead chicken meat?								
Regularly	3	1.7	24	13.7	0	0.0	2	8.3
Sometimes	1	0.6	7	4.0	1	4.2	0	0.0
No practice	171	97.7	144	82.3	23	95.8	22	91.7

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Table 30 Number and percent distribution of practices regarding avian influenza between the respondents and the key community members before and after implementation program (Cont).

Practices regarding avian influenza	Respondents (N=175)				Key community members (N=24)			
	Pretest		Posttest		Pretest		Posttest	
	No.	%	No.	%	No	%	No	%
6. Do you always protect yourself properly before contacting sick or dead poultry by wearing gloves, glasses, a mask, an apron, or a pair of boots?								
Regularly	78	44.6	126	72.0	11	45.8	20	83.3
Sometimes	14	8.0	7	4.0	0	0.0	1	4.2
No practice	83	47.4	42	24.0	13	54.2	3	12.5
7. Do you take a bath or shower, and change new cloths after work?								
Regularly	75	42.9	122	69.7	9	37.5	19	79.2
Sometimes	13	7.4	12	6.9	3	12.5	0	0.0
No practice	87	49.7	41	23.4	12	50.0	5	20.8
8. Do you always disinfect or clean the personal protective safe guards (e.g. the dirty clothes, apron, mask, gloves, glasses, and have them dried in the sunlight) before re-using?								
Regularly	75	42.9	122	69.7	10	41.7	20	83.3
Sometimes	11	6.3	11	6.3	2	8.3	0	0.0
No practice	89	50.9	42	24.0	12	50.0	4	16.7
9. At present, do you eat soft-boiled or raw eggs?								
Regularly	7	4.0	25	14.3	0	0.0	3	12.5
Sometimes	6	3.4	15	8.6	0	0.0	1	4.2
No practice	162	92.6	135	77.1	24	100.0	20	83.3
10. Do you continuously clean cages with detergent and water at least once a week?								
Regularly	36	20.6	93	53.1	6	25.0	13	54.2
Sometimes	24	13.7	19	10.9	3	12.5	7	29.2
No practice	115	65.7	63	36.0	15	62.5	4	16.7

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Table 30 Number and percent distribution of practices regarding avian influenza between the respondents and the key community members before and after implementation program (Cont).

Practices regarding avian influenza	Respondents (N=175)				Key community members (N=24)			
	Pretest		Posttest		Pretest		Posttest	
	No.	%	No.	%	No	%	No	%
11. Do you keep a close watching at children and warning them not to handle any chicken or birds and not carrying any carcasses?								
Regularly	126	72.0	129	73.7	17	70.8	20	83.3
Sometimes	9	5.1	18	10.3	2	8.3	3	12.5
No practice	40	22.9	28	16.0	5	20.8	1	4.2
12. Do you always eat well cooked chicken meat and eggs (for protection the infection of avian influenza)?								
Regularly	171	97.7	163	93.1	24	100.0	23	95.8
Sometimes	4	2.3	5	2.9	0	0.0	1	4.2
No practice	0	0.0	7	4.0	0	0.0	0	0.0
13. Do you always well cooked food before eating (to protect the infection of avian influenza)?								
Regularly	173	98.9	167	95.4	24	100.0	24	100.0
Sometimes	2	1.1	5	2.9	0	0.0	0	0.0
No practice	0	0.0	3	1.7	0	0.0	0	0.0
14. Can you properly practice yourself following the regulations of avian influenza prevention by washing hands with soap before eating, eating well cooked food, not contacting directly with sick or dead chicken?								
Regularly	154	88.0	166	94.9	22	91.7	24	100.0
Sometimes	17	9.7	6	3.4	2	8.3	0	0.0
No practice	4	2.3	3	1.7	0	0.0	0	0.0
15. Can your family members properly practice themselves following the regulations of the avian influenza prevention?								
Regularly	151	86.3	167	95.4	23	95.8	24	100.0
Sometimes	19	10.9	5	2.9	1	4.2	0	0.0
No practice	5	2.9	3	1.7	0	0.0	0	0.0

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2.3 Levels of Knowledge, Attitudes, and Practices, Self-efficacy Expectation, Necessary Perception of Prevention and Control Avian Influenza of Household Representatives in the Implement Avian Influenza Prevention and Control in the Study Village.

Knowledge: It was found that the proportions of the household representatives had high levels of knowledge toward prevention and control of avian influenza both in the pretest and posttest, 60.3 % and 85.4 %, respectively.

Attitudes: The proportion of household representatives had attitudes toward the disease in the pretest and posttest, 98.0 % and 100.0 %, respectively.

Practices: It was found that the proportions of the household representatives increased in practices after the implementation. In the pretest, a high proportion was found in the moderate level whereas in the posttest the higher proportion was in the high level.

Self-efficacy: The proportions of the household representatives highly increased perception of their self-efficacy on avian influenza prevention and control program in the community both in the pretest and the posttest, 86.9 % and 98.0 %, respectively.

Perceived necessity: The proportions of the household representatives highly increased perceived necessity in prevention and control of the disease in the community both in the pretest and the posttest, 94.5 % and 99.0 %, respectively.

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Table 31 Frequency and percentage distribution of household representatives classified by degrees of KAP, self-efficacy, and necessary perception of prevention between the pretest and posttest of the implementation.

Variables	Pretest (n = 199)		Posttest (n = 199)	
	Number	Percent	Number	Percent
Knowledge				
High (13-18 scores)	120	60.3	170	85.4
Moderate (7-12 scores)	64	32.2	25	12.6
Low (1-6 scores)	15	7.5	4	2.0
Attitudes				
High (35-51 scores)	195	98.0	199	100.0
Moderate (18-34 scores)	4	2.0	0	0.0
Low (1-17 scores)	0	0.0	0	0.0
Practices				
High (21-30 scores)	55	27.6	133	66.8
Moderate (11-20 scores)	132	66.3	63	31.7
Low (1-10 scores)	12	6.0	3	1.5
Self-efficacy				
High self-efficacy	173	86.9	195	98.0
Moderate self-efficacy	22	11.1	4	2.0
Low self-efficacy	4	2.0	0	0.0
Perceived necessity to prevention				
Very much (43-63 scores)	188	94.5	197	99.0
Moderate (22-42 scores)	11	5.5	2	1.0
Less (1-21 scores)	0	0.0	0	0.0

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2.4 Behavioral Practices on Hand Washing of Respondents in the Study Village

Table 32 shows behaviors and practices of hand washing with soap of the respondents to prevent avian influenza.

Before preparing food

In the pretest, it was found that most of the study population prepared foods (60.8%) by themselves at home. More than 70% of them washed hands regularly before preparing food and almost half of them used water alone to wash hand (48.7%). The posttest program more than 60.0% of the population prepared foods. Approximately 99.0% washed hands regularly before preparing food and more than 90.0% used soap to wash their hands.

After preparing food

The pretest program was found that slightly more than two-thirds of the respondents were related to preparing foods. More of them (71.1%) washed hands every time after preparing food and a half of them used soap to clean their hands (50.4%). In the posttest, more than 60.0% of the study population prepared foods. All of them washed hands every times after preparing food and more than 95.0% washed hand with soap.

Before eating food

Among the respondents, 54.8% washed hands sometimes before eating and 70.9% washed hands with water only. In posttest program, all study population more than 95.0% washed hands every time before eating food and more than 90.0% used soap to wash their hands.

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After using toilet

The pretest program it found that all study population (100%) used toilet regularly. Among those 62.8% washed hands every time after using the toilet and 56.0% washed hands with soap. In the posttest, all study subjects (100%) used toilet regularly. More than 95.0% washed hands every time after using toilet and more than 95.0% used soap.

After killing and cutting poultry meat

Less than 30.0 % of respondents slaughtered and cut the poultry meat. More than 90.0% confirmed that they washed their hands every time after they slaughtered or sliced the poultry meat. Approximately 76.0% used soap every time to wash their hands. In the posttest assessment, less than 20.0% of the respondents slaughtered and cut poultry meat. All study subjects (100%) washed hands every time after they slaughtered and sliced poultry meat and more than 90.0% used soap to wash hands.

After handling poultry

In the pretest assessment, 42.7% of the respondents handled or contacted the poultry. The majority of them (76.5%) washed their hands every time after handling or contacting poultry. Slightly more than a half (53.8%) used soap to clean their hands. In posttest program slightly less than 20% of respondents handled or contacted poultry. Almost all of them (97.4%) washed hands regularly after handling or contacting poultry and more than 95% washed hands with soap.

After cleaning coop/cage of poultry

In the pretest program approximately two-thirds of the respondents reported that they cleaned coop or cage of poultry. Most of them (83.0 %) washed their hands every time after cleaning coop or cage and 52.6% washed hands with soap. The posttest program, 20.1% of the respondents cleaned coop or cage of poultry. The

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majority of them (92.5%) washed their hands regularly after cleaning coop or cage of poultry and more than 90.0 % used soap to wash hands.

After feeding and watering the poultry

In the pretest program about 31% of respondents fed or watered poultry. Among those 74% washed hands every time after feeding or watering their poultry. About 52% informed that they washed hands with water only. In the posttest, about 20% of the respondents fed or watered poultry. Among those 90% washed hands every time after feeding or watering the poultry and 92.3% used soap.

After coughing or sneezing (put on hand/handkerchief/tissue)

In the pretest program almost all of the respondents put on hand/handkerchief/tissue paper when they coughed or sneezed. About 52% of them washed their hands every time after coughing or sneezing. However, 70.4% of them used water only to wash hands. The posttest program, 92.5% of the respondents used hand/handkerchief/tissue paper when they coughed or sneezed. Most of them (92.4%) washed their hands every time after coughing or sneezing. Approximately 93% of them used soap to wash their hands.

After handing garbage or dumping garbage

In the pretest, about 97% of respondents used to carry garbage or disposing garbage. Eighty five percent of them washed hands every time and 52.6% used soap to wash their hands. In the posttest, about 91% of the respondents used to caring or disposing garbage. Ninety eight point four percent of them washed hands every time and 96.2% used soap to wash their hands.

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After handling carcasses

In the pretest program approximately 65% of respondents used to contact the carcass. Almost all of them (93%) answered that they washed their hands every time after touching the carcass and 76.7% used soap to wash their hands. The posttest program found that 48% of the respondents used to handle the carcasses. Almost all of them (91.8%) informed that they washed their hands every time after touching the carcass and 94.8% used soap to wash their hands.

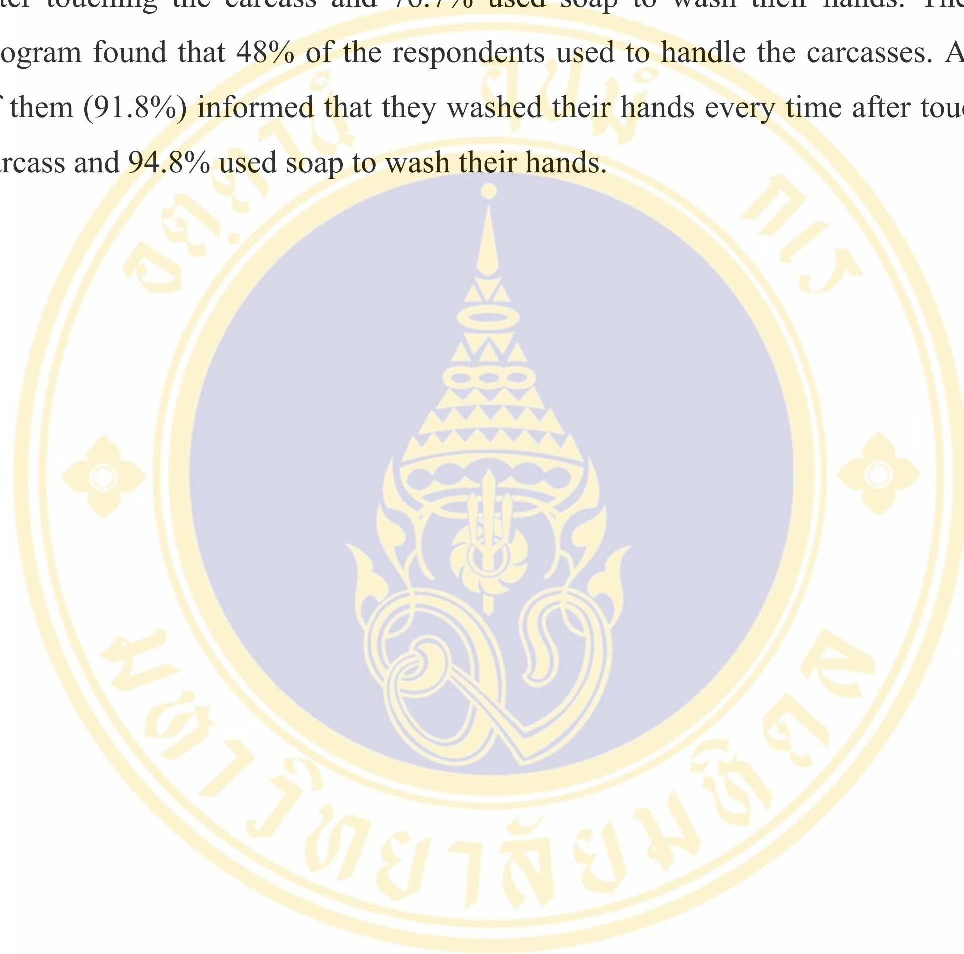

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Table 32 Frequency and percentage distribution of the household representatives by hands washing behaviors between the pretest and posttest.

Hand washing	Pretest (n = 199)		Posttest (n = 199)	
	Number	Percentage	Number	Percentage
Before preparing food				
No application	78	39.2	63	31.7
Application	121	60.8	136	68.3
Frequency of hand washing (n = 121, 136)				
All time	93	76.8	135	99.3
Sometimes	26	21.5	1	0.7
No practice	2	1.7	-	-
Methods of hand washing with (n = 119, 136)				
Water	61	51.3	4	2.9
Soap	58	48.7	132	97.1
After preparing food				
No application	77	38.7	62	31.2
Application	122	61.3	137	68.8
Frequency of hand washing (n = 122, 137)				
All time	88	71.1	137	100.0
Sometimes	31	25.4	-	-
No practice	3	2.5	-	-
Methods of hand washing with (n = 119, 137)				
Water	60	50.4	4	2.9
Soap	59	49.6	133	97.1
Before eating				
Application	199	100.0	199	100.0
Frequency of hand washing (n = 199, 199)				
All time	80	40.2	191	96.0
Sometimes	109	54.8	5	2.5
No practice	10	5.0	3	1.5
Methods of hand washing with (n = 189, 196)				
Water	134	70.9	11	5.6
Soap	55	29.1	185	94.4

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Table 32 Frequency and percentage distribution of the household representatives by hands washing behaviors between the pretest and posttest (Cont).

Hand washing	Pretest (n = 199)		Posttest (n = 199)	
	Number	Percentage	Number	Percentage
After using rest room				
Application	199	100.0	199	100.0
Frequency of hand washing (n = 199, 199)				
All time	125	62.8	195	98.0
Sometimes	68	34.2	3	1.5
No practice	6	3.0	1	0.5
Methods of hand washing with (n = 193, 198)				
Water	85	44.0	8	4.0
Soap	108	56.0	190	96.0
After killing or cutting poultry				
No application	148	74.4	169	84.9
Application	51	25.6	30	15.1
Frequency of hand washing (n = 51, 30)				
All time	47	92.1	30	100.0
Sometimes	3	5.9	-	-
No practice	1	2.0	-	-
Methods of hand washing with (n = 50, 30)				
Water	12	24.0	2	6.7
Soap	38	76.0	28	93.3
After contact with poultry				
No application	114	57.3	160	80.4
Application	85	42.7	39	19.6
Frequency of hand washing (n = 85, 39)				
All time	65	76.5	38	97.4
Sometimes	15	17.6	1	2.6
No practice	5	5.9	-	-
Methods of hand washing with (n = 80, 39)				
Water	43	53.8	1	2.6
Soap	37	46.2	38	97.4

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Table 32 Frequency and percentage distribution of the household representatives by hands washing behaviors between the pretest and posttest (Cont).

Hand washing	Pretest (n = 199)		Posttest (n = 199)	
	Number	Percentage	Number	Percentage
After cleaning coop/cage of poultry				
No application	140	70.4	159	79.9
Application	59	29.6	40	20.1
Frequency of hand washing (n = 59, 40)				
All time	49	83.0	37	92.5
Sometimes	8	13.6	2	5.0
No practice	2	3.4	1	2.5
Methods of hand washing with (n = 57, 39)				
Water	27	47.4	2	5.1
Soap	30	52.6	37	94.9
After feeding/water of poultry				
No application	136	68.3	159	79.9
Application	63	31.7	40	20.1
Frequency of hand washing (n = 63, 40)				
All time	47	74.6	36	90.0
Sometimes	10	15.9	3	7.5
No practice	6	9.5	1	2.5
Methods of hand washing with (n = 57, 39)				
Water	30	52.6	3	7.7
Soap	27	47.4	36	92.3
After coughing/sneezing put on hand				
No application	2	1.0	15	7.5
Application	197	99.0	184	92.5
Frequency of hand washing (n = 197, 184)				
All time	104	52.8	170	92.4
Sometimes	58	29.4	11	6.0
No practice	35	17.8	3	1.6
Methods of hand washing with (n = 162, 181)				
Water	114	70.4	12	6.6
Soap	48	29.6	169	93.4

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Table 32 Frequency and percentage distribution of the household representatives by hands washing behaviors between the pretest and posttest (Cont).

Hand washing	Pretest (n = 199)		Posttest (n = 199)	
	Number	Percentage	Number	Percentage
After contact with garbage or take away garbage disposal				
No application	6	3.0	17	8.5
Application	193	97.0	182	91.5
Frequency of hand washing (n = 193, 182)				
All time	164	85.0	179	98.4
Sometimes	26	13.5	3	1.6
No practice	3	1.5	-	-
Methods of hand washing with (n = 190, 182)				
Water	90	47.4	7	3.8
Soap	100	52.6	175	96.2
After contact with carcass				
No application	69	34.7	102	51.3
Application	130	65.3	97	48.7
Frequency of hand washing (n = 130, 97)				
All time	121	93.0	89	91.8
Sometimes	8	6.2	8	8.2
No practice	1	0.8	-	-
Methods of hand washing with (n = 129, 97)				
Water	30	23.3	5	5.2
Soap	99	76.7	92	94.8

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2.5 Comparisons of Mean Scores of Knowledge, Attitudes, and Practices of Avian Influenza, Hand Washing with Soap, Perceived Self-efficacy, and Perceived Necessity to Prevent Avian Influenza between Before and After Implementation Program.

Table 33 shows the mean score of avian influenza knowledge of the respondents before and after the implementation program. It was found that mean scores were 12.31 and 15.08, respectively. When the mean scores of the two groups were compared and tested, there was a statistical significant difference (t = 9.98 at p-value < 0.001).

The results of attitudes analysis show that mean scores of the respondents before and after the implementation program was 45.78 and 48.42, respectively. There was a significant different mean scores (t = -8.195, p-value < 0.001)

The results of practice behaviors to prevent avian influenza were found that the mean scores of respondents before and after the implementation program was 17.57 and 21.50, respectively. The statistical significant difference was tested where t = -8.726 at p-value < 0.001.

The frequency of hand washing behaviors to prevent the disease of respondents was found that the mean scores of respondents before and after the implementation program was 11.70 and 12.62, respectively. Hand washing behavior of the respondents after the implementation was significantly different from before the implementation (t = -2.391, p-value = 0.018).

The analysis of hand washing with soap behaviors of respondents was found that the mean score before (3.31) and had significant difference from behavior after (6.11) the implementation program (t = -12.550 at p-value < 0.001).

The results of self-efficacy analysis show that the mean scores of respondents before and after the implementation program was 35.49 and 40.64, respectively. The mean scores were significantly different (t = 10.607 at p-value < 0.001).

The result of perceived necessity to prevention and control of avian influenza shows that the mean score of respondents before and after the experimental program was 55.50 and 58.38, respectively. When the mean scores were tested, there was a statistical significant difference (t = -4.702, p-value< 0.001).

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Table 33 The comparison of difference of avian influenza KAP, practice behavior on hands washing, self-efficacy on behavioral practice for avian influenza prevention and control before and after the implementation program.

Variables	N	Mean	S.D.	t-value	df	p-value
Avian flu knowledge						
Pretest	199	12.31	3.530	9.980	198	< .001
Posttest	199	15.08	2.638			
Attitudes to avian flu						
Pretest	199	45.78	3.827	-8.195	198	< .001
Posttest	199	48.42	2.919			
Practices behavior about avian flu						
Pretest	199	17.57	4.152	-8.726	198	< .001
Posttest	199	21.50	4.757			
Hand washing behaviors						
Frequency of hand washing						
Pretest	199	11.70	4.283	-2.391	198	0.018
Posttest	199	12.62	4.136			
Methods of hand washing with						
Soap						
Pretest	199	3.31	2.640	-12.550	198	<.001
Posttest	199	6.11	2.097			
Perceived Self-efficacy						
Pretest	199	35.49	7.362	10.607	198	< .001
Posttest	199	40.64	3.353			
Perceived necessary of prevention						
Pretest	199	55.50	6.432	-4.702	198	<.001
Posttest	199	58.38	5.791			

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2.6 People's Satisfaction to the Research Project and to Working of Key Community stakeholders.

Table 34 shows number and percentage of the household representatives regarding their satisfaction to the research project and to working activities of the key communities. The satisfaction was categorized into 3 groups, namely, very, moderate, and less. There were 18 items tested for the people's satisfaction to the research project and to activities of the key community members toward the prevention and control of avian influenza. It was found that more than 90% of the respondents had very satisfied and agreed with the statements of: (1) You satisfied the performance of the researcher who worked for the project, (2) You agreed and satisfied to have the research project been conducting to prevent and control avian influenza in your village, (3) Hand washing with soap every time before eating food, (4) Gathering poultry animal carcasses with unidentified causes, should to properly bury or burn.

More than 80% of the household representatives satisfied and agreed with the statements: (1) You knew or understood the objectives of the project for prevention and control of avian influenza in your village, (2) You are agreed or satisfied the duration of conducting the project for prevention and control of avian influenza in your village (6 months), (3) You are satisfied with the key community members who continuously interested in the problems in your village, (4) You are satisfied with the work of the key community members in the performance of prevention and control of avian influenza in your village, (5) You are satisfied with the rules to prohibit movement of poultry in and out of the village, (6) Cleaning house, cage/coop and improving the environment around the house once a week (every Friday), (7) Don't cook the dead chicken meat with unidentified causes for food, (8) Don't contact sick or dead chicken if not necessary. If necessary, wear the personal safeguards such as gloves and mask, (9) When chicken or other fowl were sick or dead, promptly inform the livestock officer, your village headman or Tambon Administrative Organization, (10) You are satisfied or agreed with applying the empowerment method to the key community members for avian influenza prevention and control in the village, (11) You are satisfied or agreed with your village had developed a network to prevent and control avian influenza, and (12) You are satisfied or agreed with your village

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developing the plan, implementation, and evaluation of avian influenza prevention and control.

There were only two questions that more than 60% of respondents were satisfied or agreed with namely (1) to protect migratory birds not to enter the village and (2) the capability of the key community stakeholders that could transfer knowledge and gave consults about avian influenza problem to people in the village.

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Table 34 Frequency and percentage distribution of the people's satisfaction to the project and working of the key community stakeholders regarding the activities prevention and control of avian influenza in the study village.

Statements	Satisfaction levels (N=175)						Mode
	Very		Middle		Less		
	No	%	No	%	No.	%	
1. You satisfied the researcher (Mr.Tavorn Maton) who came to perform the research project in your village.	160	91.5	13	7.4	2	1.1	Very
2. You knew or understood toward the objectives of the research project for prevention and control of avian influenza in your village, more or less.	149	85.1	21	12.0	5	2.9	Very
3. You agreed or satisfied to having the research project for conducting to prevention and control of avian influenza in your village.	158	90.3	17	9.7	0	0.0	Very
4. You agreed or satisfied the duration of conducting the research project prevention and control of avian influenza in your village (duration 6 months).	157	89.7	17	9.7	1	0.6	Very
5. You satisfied the key communities that they continuously interested to the avian influenza problem in your village.	143	81.7	21	12.0	11	6.3	Very
6. You satisfied working of the key communities in the performance of prevention and control of avian influenza in your village.	143	81.7	24	13.7	8	4.6	Very
7. You satisfied about strict prohibition for the movement of poultry animal to get in or out-of-village.	151	86.3	17	9.7	7	4.0	Very
8. You satisfied or agreed with the measurement of avian influenza prevention in your village on an issues: 8.1 Cleaning house, cage/coop and improving the environment around house at least one time/week (every Friday)	148	84.6	23	13.1	4	2.3	Very
8.2 Don't take the dead chicken with unknown causes to cook food.	145	82.9	22	12.6	8	4.6	Very

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Table 34 Frequency and percentage distribution of the people's satisfaction to the project and working of the key community stakeholders regarding the activities prevention and control of avian influenza in the study village (Cont).

Statements	Satisfaction levels (N=175)						Mode
	Very		Middle		Less		
	No	%	No	%	No.	%	
8.3 Protection covered of birds that doesn't enter to live in the village.	118	67.4	27	15.4	30	17.1	Very
8.4 Don't contact with sick or dead chicken if not necessity, if necessary, ware the personal protective equipment such as gloves and mask.	151	86.3	22	12.6	2	1.1	Very
8.5 Hand washing with soap all time before eating food.	162	92.6	12	6.9	1	0.6	Very
9. You agreed with the measurement of avian influenza control in your village on an issues: 9.1 Gathering poultry animal carcass which was sick/dead with unknown causes, to properly bury or burn	158	90.3	17	9.7	0	0.0	Very
9.2 When have the chicken or poultry animal was sick or dead, promptly inform to livestock animal officer, village headman or Tambon Administrative Organization.	152	86.9	21	12.0	2	1.1	Very
10. You satisfied or agree with applying the empowerment method to the key communities for avian influenza prevention and control in the village.	151	86.3	24	13.7	0	0.0	Very
11. You satisfied or agreed with your village had working network to prevention and control of avian influenza cover the village.	143	81.7	31	17.7	1	0.6	Very
12. You satisfied or agreed with your village could take the plan, implementation, and evaluation of avian influenza prevention and control by cooperation of people in the village and authorities were supporters.	143	81.7	30	17.1	2	1.1	Very
13. You satisfied with capability of the key communities that could educate and be counselor about avian influenza problem to people in the village.	133	76.0	39	22.3	3	1.7	Very

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Table 35 displays levels of satisfaction of participants. The scores ranged from 0-54 with the mean score was 50.91and standard deviation was 4.305. The satisfaction was classified into 3 categories, high, moderate, and low. The scores derived from a 3-point scale depending on respondents' perception. Scores of the low satisfaction ranged less than 18 points, scores of the moderate satisfaction ranged from 18-36, and scores of the high satisfaction ranged greater than 36. The majority of respondents had high satisfaction to the project activities and to the work of the key community members in the performance of prevention and control of avian influenza in the study village.

Table 35 Number and percentage of participants identified by satisfaction levels of the project activities of prevention and control of avian influenza.

People's satisfaction levels	Number (N = 199)	Percentage
High (> 36 points)	172	98.3
Moderate (18-36 points)	3	1.7
Low (< 18 points)	0	0.0

$\bar{X}$ = 50.73, S.D. = 4.410, Minimum score = 36, Maximum score = 54

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2.7 People's participation in the project activities

Table 36 shows number and percentage of participants regarding participation in the action of prevention and control of avian influenza in the study village. More than 80% of participants knew toward the action of activities in prevention and control of avian influenza that was assigned by the key community stakeholders. Most of participants (80.2%) received the information from the key community stakeholders and most of them were persuaded to attend the meeting (55.8%) to learn the practices activities.

The participation of people in the action of prevention and control of avian influenza illustrated that three-fourths of participants cooperated with the activities, and almost all of them attended the meeting (96.0%).

The proportion of the participants who practiced for prevention and control of avian influenza by themselves (80.9%) was substantially higher than those who did not (24.8%). Most of them cooked food and/or eat well cooked eggs and meat of chicken (41.6%).

The broadcast tower announced information regarding avian influenza in the village. It showed that more than 80% of participants broadcasted information of avian influenza also reached to other people, and most of information broadcasted to their kindred in the village (68.7%).

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Table 36 Frequency and percentage distribution of the people's participation regarding the activities prevention and control of avian influenza in the study village.

People's participation	Number (n = 199)	Percentage
Received information about prevention activities of avian influenza (19th item)		
Yes	172	86.4
Knew from (more than one answer): (n = 172)		
Key community	138	80.2
Health worker	19	11.0
Others person	43	24.0
They persuaded you did activities what (more than one answer): (n = 172)		
Attended meeting	96	55.8
Eliminated sick/dead animal	33	19.2
Washed hands after contact animal	27	15.7
Sprayed disinfectants in coop/cage	34	19.8
Enclosed coop/cage	10	5.8
Others	31	18.0
No	27	13.6
Reason: (n = 27)		
Key community never tell me	6	22.2
Can not go anywhere	2	7.4
Hardly stay in the house	4	14.8
Others	15	55.6
Participation in the activities that the key communities performed (20th item)		
Yes	151	75.9
By (more than one answer): (n = 151)		
Attended meeting	145	96.0
Others (inform, sprayed anti-infective virus)	13	8.6
No	48	24.1
Because (more than one answer): (n = 48)		
Can not go anywhere (oldness)	3	6.3
Don't know	11	22.9
No time	18	37.5
Hardly stay in the house	4	8.3
Others	14	29.2

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Table 36 Frequency and percentage distribution of the people's participation regarding the activities prevention and control of avian influenza in the study village (Cont).

People's participation	Number (n = 199)	Percentage
Practicing behaviors toward avian influenza prevention and control (21st item)		
Yes	161	80.9
The activities were done (more than one answer): (n = 161)		
Cooked/eating fully cooked eggs and meat chicken	67	41.6
Don't touch dead chicken	35	21.7
Washed hand after contact poultry	29	18.0
Sprayed disinfectants in coop/cage	34	21.1
Health care oneself and closer persons	35	21.7
Take others action	40	24.8
No	38	19.1
Because (more than one answer): (n = 38)		
Can not take anything (oldness)	1	2.6
Nobody don't tell/recommend	9	23.7
No time	16	42.1
Hardly stay in the house	8	21.1
Others	11	28.9
Broadcasting toward avian influenza information (22nd item)		
Yes	163	81.9
The activities were done (more than one answer): (n = 163)		
Persons in family	48	29.4
People in the village or neighborhood	71	43.6
Kindred	112	68.7
Others	7	4.3
No	36	18.1
Because (more than one answer): (n = 36)		
Don't understand in content of avian influenza	5	13.9
No time	9	25.0
Could not recommend others people To understand	2	5.6
Don't attended meet	5	13.9
Causes of others	18	50.0

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2.8 Self-Esteem of the Key Community members and Household Representatives

Self-esteem was measured according to the Rosenberg Self-Esteem Scale (88) including ten items. In-depth interview was used to assess the self-esteem. To measure the feeling of the key community stakeholders and the household representatives who assessed themselves as they were significant and be accepted by the society. They also had ability to do something successful. The summary of data from the in-depth interview of the household representatives and the key community stakeholders included 20 persons. We could summarize that most of informants had self-esteem in term of self-respectation and self-confidence. They gave supportive reasons in each answer as follows.

Question 1: You feel that you are a worthy person like other people, don't you?

More than half of informants (12 from 20 persons) felt like that. The reasons they gave: They could do every thing the same as others. They had good job and earned a living like others. However, almost two-fourths of informants (8 of 20) felt like that. The reasons they gave: They had less knowledge, experiences poverty and did not have land. Besides those reasons, there were a few informants (2 persons) gave the reason that they earned less than the others.

Question 2: You feel that you have done good qualities, haven't you?

Three-fourths of informants (15 from 20 persons) stated that they felt like that. The reasons they gave: "We've met the achievement in authorities and jobs". We have job, a good career, and money in our families". However, almost one-third of informants stated that they did not feel like that. The reasons they gave: We were separated". Some informant did not satisfy to their job.

Question 3: All in all, you inclined to feel that you are a failure, don't you?

Almost three-fourths of informants stated that they did not feel like that. The reasons they gave: They had job and happiness in their families. They had confidence in the things they have done. "We met achievement and successful in jobs". However, almost two-fourths of informants (7 from 20 persons) stated that we felt like that. The reasons they gave: "We resigned the jobs and have frequently changed the jobs. We lost what we have been doing in the rice farm".

Question 4: You are able to do things like others, aren't you?

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Almost all of informants (19 from 20 persons) stated that they had that feeling. The reasons they gave: “We could do thing the same as others”. “We were able to do things the same as others who had the same age”. “There was only one person told that he felt like that since he was old and unable to do job”.

Question 5: You feel you do not have much of proud, do you?

Three-fourths of informants (15 from 20 persons) stated that they did not agree with that. The reasons they gave: “Everyone had to be proud of him”. At present, they were respected by people in their community. They did honest jobs for living. They took care of their families. However, a third of informants stated that they felt like that. The reasons they gave: No job made no money. Some said they got less knowledge.

Question 6: You have positive attitudes toward yourself, haven’t you?

Almost all of informants (19 from 20 persons) stated that they are remarkable people. The reasons they gave: They satisfied to themselves since they made everything on their own. They thought that they were good persons and did not make anyone got into troubles. They were able to do job for living. There was only one stated that he did not feel like that. He gave the reason that he got less knowledge.

Question 7: As the whole you satisfied yourself, don’t you?

All of informants (20 persons) stated that they felt like that. The reasons they gave: They could do self-help. They were proud themselves. They satisfied with things that they had.

Question 8: You wish you could have more respect to yourself, couldn’t you?

Almost all of informants (17 from 20 persons) told that they felt like that. The reasons they gave: “We need to develop our knowledge and skill in working”. Somebody needed to have the thing that they did not have. They needed to develop their health care in order to be healthy and to work the job continuously. They always offered others for social help. However, there were three persons told that they did not feel like that. The reasons they gave: “Nowadays, they satisfied to their situation”.

Question 9: You certainly feel less worthy at times, don’t you?

Almost all of informants (16 of 20 persons) stated that they did not have that feeling. The reasons they gave: They could do everything. They had jobs. They liked to offer others for social help. They were good persons in society. However, there

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were four persons stated that they felt like that. The reasons they gave: One person told that her health was not good. This affected her job. Another one told that he got tension since he had a lot of free times.

Question 10: At times you think you are not good at all, are you?

All of informants (20 persons) told that they did not feel the thing. The reasons they gave: They did merit things every day. They were good persons, but others might have looked that they were not. They did not put anyone into troubles. They did honest job for living and had their own business. Beside those there were three persons told that they always made favors to others for social help.

2.9 The Advantages and Benefits of the Project Activities to the Village after Implementation Program.

The advantages and benefits of the project activities that the community received after the program ended. The summary of data from the in-depth interview derived from 20 persons, 10 household representatives and 10 key community stakeholders. All 20 informants stated that the project activities in prevention and control of avian influenza provided more advantages to their communities included: (1) People increased knowledge of prevention of avian influenza, (2) Received more information about avian influenza, (3) Meet and exchange of opinion, (4) Unity of people occurred in the village where they can get together, and (5) The people cooperated each other in order to protect themselves from avian influenza.

Regarding the benefits of the project activities that the village received after the implementation program ended. When considering the comparison between before and after the implementation all 20 informants stated that after the implementation program their village gained benefits from involving in the project activities including: (1) No one was infected from avian influenza, (2) People were active to prevent and control the disease, (3) More people participated in the activities than previous time, (4) The households that raised domestic poultry received antiseptic spray for their premises and animals, (5) People participated to prevent and to control avian influenza, and (6) Their village had surveillance network of avian influenza.

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2.10. The Factors Influenced to People's Participation in the Project Activities of Prevention and Control of Avian Influenza in the Study Village.

The univariate analysis of factors associated with people's participation in the project activities of prevention and control avian influenza in the study village was summarized in Table 37. The group who reported that they raised domestic poultry were more likely to participate in the project activities than those who did not raise domestic poultry (OR = 3.28, 95% CI = 1.52 – 7.06). Participants who received information about avian influenza were little likely to participate in the project activities than who did not receive information (OR = 1.13, 95% CI = 0.55 – 2.30). Subjects who had high level of practice scores toward avian influenza were slightly likely to participate in the project activities than those who had low level of practice scores (OR = 1.51, 95% CI = 0.63 – 3.58). The respondents who had high level of self-efficacy scores toward avian influenza were likely to participate in the project activities than those who had lower level of self-efficacy scores (OR = 10.00, 95% CI = 0.01 – 98.50).

The results of multivariate analysis were summarized in Table 38. Variables that were significant in univariate analysis at a level of p-value ≤ .05 were included in the multivariate model. Participants who had family income less than 5,000 Baht were likely to participate in the project activities than those who had family income more than 5,000 Baht (OR = 2.27, 95% CI = 1.00 – 5.17). Participants who raised domestic poultry were little likely to participate in the project activities than those who did not raise domestic poultry (OR = 4.07, 95% CI = 1.63 – 10.15). The respondents who had high level of self-efficacy scores toward avian influenza were significantly likely to participate in the project activities than those who had low level of self-efficacy scores (OR = 12.93, 95% CI = 1.03 – 161.71).

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Table 37 Factors influenced people's participation in the project activities of prevention and control avian influenza.

Factors/Variables	Participation				OR	95%CI	p-value
	Yes		No				
	N /Total	%	N /Total	%			
Gender							0.360
Male	68/86	79.1	18/86	20.9	1.36	0.70 – 2.62	
Female	83/113	73.5	30/113	26.5	1		
Age							0.660
15-31	37/49	75.5	12/49	24.5	1.23	0.50 – 3.03	
32-48	79/101	78.2	22/101	21.8	1.43	0.65 – 3.13	
49-65	35/49	71.4	14/49	28.6	1		
Education							0.892
Primary school	124/163	76.1	39/163	23.9	1.06	0.45 – 2.44	
High school	27/36	75.0	9/36	25.0	1		
Occupation							0.195
Employee	71/93	76.3	22/93	23.7	1.61	0.73 – 3.53	
Agriculture	50/61	82.0	11/61	18.0	2.27	0.92 – 5.59	
Others	30/45	66.7	15/45	33.3	1		
Family income per month							0.315
< 5,000	88/112	78.6	24/112	21.4	1.39	0.72 – 2.68	
5,000 through highest	63/87	72.4	24/87	27.6	1		
Marital Status							0.291
Single	23/31	74.2	8/31	25.8	1.83	0.52 – 6.34	
Married	117/150	78.0	33/150	22.0	2.25	0.81 – 6.27	
Others	11/18	61.1	7/18	38.9	1		
Having elderly or children in family							0.720
No	37/50	74.0	13/50	26.0	1		
Yes	114/149	76.5	35/149	23.5	1.14	0.54 – 2.39	

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Table 37 Factors influenced people's participation in the project activities of prevention and control avian influenza (Cont).

Factors/Variables	Participation				OR	95%CI	p-value
	Yes		No				
	N /Total	%	N /Total	%			
Raising domestic poultry							**0.002**
No	81/119	68.1	38/119	31.9	1		
Yes	70/80	87.5	10/80	12.5	3.28	1.52 – 7.06	
Killed domestic poultry for consuming							0.733
No	103/137	75.2	34/137	24.8	1		
Yes	48/62	77.4	14/62	22.6	1.13	0.55 – 2.30	
Information regarding avian flu							**0.017**
No	10/19	52.6	9/19	47.4	1		
Yes	141/180	78.3	39/180	21.7	3.25	1.23 – 8.56	
Level of Knowledge							0.349
Low	20/29	69.0	9/29	31.0	1		
High	131/170	77.1	39/170	22.9	1.51	0.63 – 3.58	
Level of Practices							**0.014**
Low	43/66	65.2	23/66	34.8	1		
High	108/133	81.2	25/133	18.8	2.31	1.18 – 4.50	
Level of Self-efficacy							**0.049**
L0w	1/4	25.0	3/4	75.0	1		
High	150/195	76.9	45/195	23.1	10.00	0.01 – 98.50	
Level of necessary perception							0.415
Less	1/2	50.0	1/2	50.0	1		
Very	150/197	76.1	47/197	23.9	3.19	0.19 – 52.01	
Level of people's satisfaction							0.999
Less	3/3	100.0	0	0.0	1		
High	148/196	75.5	48/196	24.5	5.24E+08		

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Table 38 Multivariate analysis of factors associated with people's participation in the project activities of prevention and control avian influenza in the study village.

Variables	Adjusted OR	95% CI	p-value
Gender			
Male	1.58	0.51 – 2.58	0.721
Female	1		
Age			
15-31	1.34	0.35 – 5.06	0.660
32-48	1.50	0.56 – 4.03	0.414
49-65	1		
Education			
Primary school	0.78	0.22 – 2.68	0.700
High school	1		
Occupation			
Employee	1.37	0.52 – 3.58	0.512
Agriculture	1.93	0.64 – 5.79	0.240
Others	1		
Family income per month			
< 5,000	2.27	1.00 – 5.17	**0.050**
5,000 through highest	1		
Marital Status			
Single	0.83	0.16 – 4.19	0.822
Married	1.20	0.32 – 4.41	0.783
Others	1		
Having elderly or children in family			
No	1		
Yes	0.87	0.36 – 2.13	0.776

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Table 38 Multivariate analysis of factors associated with people's participation in the project activities of prevention and control avian influenza in the study village (Cont).

Variables	Adjusted OR	95% CI	p-value
Raising domestic poultry			
No	1		
Yes	4.07	1.63 – 10.15	**0.003**
Killed domestic poultry for consuming			
No	1		
Yes	0.66	0.26 – 1.65	0.379
Information regarding avian flu			
No	1		
Yes	2.63	0.82 – 8.40	0.101
Level of Knowledge			
Low	1		
High	0.99	0.33 – 2.92	0.994
Level of Practices			
Low	1		
High	1.81	0.82 – 4.00	0.139
Level of Self-efficacy			
Less	1		
High	12.93	1.03 – 161.71	**0.047**
Level of necessary perception			
Less	1		
Very	2.83	0.06 – 116.25	0.583
Level of people's satisfaction			
Less	1		
High	5.49E+08	0.00	0.999

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Situation of Avian Influenza in the village after the Implementation

After the implementation program, domestic poultry was sick or dead decrease. Since we created surveillance network the disease in the household level in the village. When have early epidemic of avian influenza in domestic poultry. The key community stakeholders and people, who raised poultry, immediately sprayed antiseptic viruses. The epidemic of the disease was restricted. Furthermore, the people in the village were aware in prevention and control of the disease. The method for prevention and control avian influenza emphasized to improve of individual hygiene, food safety, and proper carcass elimination, use of safeguard instruments to protect viruses, to improve environmental sanitation in and around the house, and also in cages or coops in the village. Since they received the knowledge from the key community stakeholders that continuously campaigned health education. This affected to be not human case of avian influenza in the village this year.

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CHAPTER V
DISCUSSION

This study was conducted in Song Phi Nong District, Suphan Buri Province where the last outbreak of the disease occurred in 2004, to gather information of risk population, awareness of disease transmission, attitudes toward susceptibility and severity, and self-protective behaviors. Some studies revealed that the outbreak of avian influenza in human occurred definitely in the same area where the outbreak of avian influenza happened in poultry. The study illustrated that the main risk factor of avian influenza was the poultry contact. The highest risk was a direct contact with infected or dead animals as well as eating dead chicken meat (5). This may show that there is either lack of knowledge or improper behavioral practices. A less number of studies on KAP avian influenza were done in our country. According to the KAP survey in 2004 (9), about 98% of the study population received information about AI from mass media especially television. Knowledge and attitudes between before and after the outbreak were statistically significant. On the other hand, 31.6% of behaviors to protect themselves had changed. Similar observations were also found in other studies (71). Awareness of AI among people who domicile in contaminated areas in Thailand showed that 68.50% of people do not know symptoms and characteristics of the disease. The study found a significant proportion of the population was at risk of AI infection despite a high level of knowledge. Behavioral data is of importance to set various points of public health intervention and it also helps to identify who is at risk. Such kind of information is also useful for efficient use of resources in the fight against epidemic.

Key community stakeholders were chosen because they are usually representative of people in the community. Therefore, the individuals that could potentially affected to the avian influenza prevention and control program were identified. These key community members have played important roles in health promotion and community development. It is important to have people participate and

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concern how to prevent and control of avian influenza effectively and sanitarily. Health providers need to develop a health education program for people to change their behaviors, to increase more awareness about the problems, and to involve with making decision and planning to solve the problem by process of empowerment.

The discussion is presented in two parts: Part I: discussion on research methodology and Part II: discussion on major findings.

Part I: Discussion on Research Methodology

1.1 Research Design and Study Samples

Research design of this study was divided into 2 phases. The first phase was a cross-sectional analytic study and the second was an action research. With respect to the objectives of the study, two study phases were proposed. The study design and methodology of each study phase was independently planned. Different sets of population and samples were involved in accordance with each study objective.

A cross-sectional study design was carried out to access knowledge, attitudes, and practices regarding prevention and control of avian influenza in almost all sub-districts in Song Phi Nong District, Suphan Buri Province. A structured interview questionnaire was applied for data collection. Pre-testing of questionnaire was tried out and revised to be easily understandable for interviewers and respondents. However, several limitations were still found in this study. This study was carried out in 14 sub-districts and 42 villages. These samples were randomed from 14 sub-districts and 140 villages in Song Phi Nong District by multi-stage random sampling technique. The people in each village were randomly selected for interview by means of simple random sampling. People we interviewed were different in occupation that might not involve with poultry and bird raising or keeping. With regard to information in this study, raising poultry was based on the informants. Therefore, some information bias could occur, such as the household representative who raised domestic poultry might give inaccurate or untrue answers since they wondered that the domestic poultry of them had to be killed by the livestock authority if they gave true

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information. This might lead to lower estimation of the number and type of domestic poultry, the result might have information bias.

The second phase, action research and intervention were the one group pretest-posttest action research, carried out on an experimental group. Both quantitative and qualitative data was collected before, after and during the implementation. The experimental group received a research intervention through a community-based empowerment program (CBEP). Therefore, the effective activities on prevention and control of avian influenza at the community level must be designed upon socio-cultural and environmental context of the community. Moreover, the activities should be adjusted and re-planned from time to time by the key community stakeholders through active participation according to their experiences learned from the previous phases of action. The main study samples were key community stakeholders, since it was not possible to bring all community members to involve in the study program activities. Therefore, the community members were affected directly or indirectly by the avian influenza, which was the primary target. Under the present community administrative structure and health care delivery system, village headman and his assistance, village health volunteers, members of housewife group, members of Sub-district Administrative Organization, committee of village, members of village security group were recruited in the first place. Then a household representative was nominated. In doing so, the avian influenza program activities that were planned by the community (key community stakeholders) were transferred to the grass root (household) level. On the other hand, the experiences learned at the household level were reflected for re-planning at the community section and community levels. Thus, the activities for avian influenza prevention and control program of this study were actually the community-based approach. The intervention methods to achieve the goals and targets of the program should be outlined. Area prioritization should be included in order to emphasize high risk areas. Such prioritization of areas should be reviewed periodically to ensure that the limited resources are effectively allocated. Control measure should be focused on all risk areas especially the area that there was an outbreak of avian influenza in poultry.

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1.2 Community-based Empowerment Program (CBEP)

Community-based empowerment curriculum was designed for two major objectives in avian influenza education: firstly, to enable the key community stakeholders to experience “deep” learning; and secondly, to facilitate the development of planning and implementation skills. In this case community mapping at the beginning of the study, discussion, active learning, and observation through monthly meeting for reflection of experienced learned and re-planning were employed. The mapping activity presented an opportunity for key community stakeholders to visually experiment with the ideas they had exploring during the preceding planning sessions. The maps helped to identify locations of community risk area or the location of possible distribution agent area.

Part II: Research Findings

The major findings of this study are discussed separately as follows.

2.1 Phase I

The first objective: To assess knowledge, attitudes, practices (KAP) and other base line information regarding avian influenza among community members, key community stakeholders and household representatives in Song Phi Nong District.

1) General Demographic Characteristics Information

All respondents were ranged by ages from 15 to 65 years, more than half (54.8%) were aged between 32 – 48 years. Gender rates showing female (71.6%) was higher than male (35.3%). Almost all study populations were Buddhism. The majority (75.1%) finished primary school, and 78.6% were married. Among the respondents, there was slightly different between those who were agriculturists and labors, 42.3% and 40.4%, respectively. The proportion of who earned between 5,000 – 10,000 Baht per month to those who earned less than 5,000 Baht was a little difference,

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46.4% and 43.6%, respectively. Most of respondents (80.6%) reported that they had elderly and/or children living in their houses, and 48.6% of those having children aged less than 15 years old. Almost of respondents (95.9%) received avian influenza information through television (91.5%). About a half of respondents (43.6%) raised poultry in their premises. Few of them (0.5%) worked in the avian industry farms. More than half of poultry raised by people (55.3%) were domestic native chicken (contrast to domestic hybrid chicken and to fighting roosters). Generally, the people raised native chicken for household meat supplement. Slightly less than two-thirds (63.0%) raised 10- 50 native chicken per house and more than 80 % raised poultry in the house yard. More than half who raised native chicken (54.5%) never contacted the animals. Almost of respondents fed the poultry by themselves (75.7%). Culturally, Suphan Buri is the land of raising fighting roosters, 34.5% of the respondents also raised them at home, and more than third (39.8%) raised them between 10 -20 roosters per house, and 80.5% released them freely living in the house yard. Among those who raised the fighting roosters, 36.4% contacted the roosters daily for feeding and caring, particularly 70.3% of respondents exposed to the rooster by themselves. Results indicated low number of people dealt with industrial poultry farms due to there were less number of large avian farming industry in Song Phi Nong. Most of people raised their own domestic chicken and ducks for food supplement. News and short spot education from televised program could help people knew story about AI, but it was in a superficial knowledge level. However, TV programs encouraged people’s awareness in general to prevent the disease. But people’s knowing about AI did not adequately enabled villagers to have appropriate protection, such as using mask, gloves, and goggles while contacting poultry.

The study on the use of poultry meat for cooking and consuming at home found that majority of the respondents (74.9%) preferred to purchase the chicken meat from the fresh markets. The fresh market in Song Phi Nong municipality was the most favorite place the respondents went frequently (73.7%). Approximately fourth (25.1%) slaughtered the poultry they raised for consuming and very few of them (2.0%) used a mask safeguard to protect while operating. Respondents 45.7% reported that they slaughtered the poultry by themselves, and the common place to do was in the house yard. The method to kill native chicken for food was by cutting the neck (98.5%).

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People in the district, traditionally, consumed well cooked meat, sometimes or rarely the people cooked raw chicken meat.

2) Level of KAP on avian influenza

Levels of knowledge, attitudes and practices toward the avian influenza are presented showing 85.1% of respondents had an intermediate knowledge level ranged between 7-12 scores (Mean = 10.6 scores, S.D. =1.8). Concerning that the attitude levels, 98.9% were in a positive direction ranged in high levels of 35-51 scores (Mean = 46.27 scores, S.D. = 3.54). Respondents, 67.5%, were in intermediate appropriate practice levels ranged among 10-20 scores (Mean = 18.2, S.D. = 4.0).

The results showed that knowledge and practices of respondents were in the moderate level except the attitudes were in the high level. This is because most of respondents received information about AI from the television set more than 90 %, which was an inadequate content of information to be affected to awareness of prevention of the disease among people. In addition, the respondents received less information toward prevention and control of AI from health personnel (49.5%). Therefore, to empower the people especially in the risk group and their families are necessary regarding protective measures to the infection of AI in the contaminated areas.

3) Personal hygiene and behaviors of hand washing

Interview gathered information on how the people behaved themselves to protect from known or unknown infected animals. Particularly, behavioral practices were found that 86% washed their hands every time before meal and 54.6% among those washed hands with soap. In the study areas, 100% of households equipped with toilet, and all people had to using it. Among those, 92.5% washed hands every time after using toilet and 60.6% of those washed hands with soap. Approximately 25 % of respondents slaughtered poultry or sliced the poultry meat. Almost of them (98.0%) confirmed that they washed their hands every time after slaughtering or slicing the

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poultry. About 80% of respondents used soap regularly to wash their hands. Forty point two percent of the samples handled or contacted with the domestic poultry.

The majority (93.5%) washed their hands every time after handling or contacting the domestic poultry. Most (84.3 %) used soap to wash their hands. Slightly more than two-thirds of the respondents reported that they cleaned cages of poultry. Almost all respondents (94.7%) washed their hands every time after cleaning the cages and 83.3% washed hands with soap. About 68% of respondents fed or watered their poultry regularly. Among those 92.4% washed hands every time after feeding or watering the poultry and 75% of them informed using soap to wash their hands. About 94% of respondents used to dumping or handling garbage and 80.4% washed hands after working with garbage and 64.5 % washed their hands with soap. Approximately 68% of respondents used to involve with animal carcasses. Almost all of them (96.3%) responded that they washed their hands every time after handling carcasses and 74.0% used soap to wash their hands after work.

4) Factors associated with KAP toward avian influenza

The findings revealed associations between K, A and P variables and that of socio-economic variables. Knowledge and practice variables presented were divided into three levels of low, medium, and high scores. Attitude scores were divided into 2 levels of un-favorableness and favorableness toward the occurrence of the disease.

Knowledge: Obviously, the majority of respondents had knowledge in a moderate level. The proportion of respondents who never attended school and those who finished primary school had significantly higher percent of avian flu knowledge than those who finished high school or above ($p= 0.009$). The difference in knowledge proportions was found between the respondents who received and did not receive the information about avian influenza. The respondents who received information were more likely to have a better knowledge level ($p<0.001$).

Attitudes toward avian flu health burden are presented. The respondents who favored avian influenza was a disease burden were greater than who did not favor in every level of family income. The lowest proportion in unfavorable attitudes was found in the respondents who earned less than 5,000 Baht, and the highest proportion was in favorable attitude among who earned 5,000 – 10,000 Baht per month (p =

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0.016). The respondents who received information were more likely to have favorable attitudes that the disease caused a hardship of life. Findings indicated that the people receiving information were significantly higher proportion of favorableness than the people who were not ($p<0.001$).

Practices referred to the respondents' behaviors in relation to prevention and protection against avian flu infection. Practices are presented in term of practice scores of "Low", "Medium", and "High". The total score is 30. Low score represents scores ranged from 1 to 10 scores, medium represents 11 to 20 scores, and high represents 21 to 30 scores. It was found that who had family income more than 10,000 Baht were more likely than other income groups to have good practice to prevent avian influenza ($p<0.05$). Greater proportions of the respondents who had and who did not have children or elderly were found in medium and high levels of practices.

Results indicated that the respondents whose families had children or elderly living in were more likely to have better practices to prevent avian influenza ($p<0.05$). Higher proportion in a high practice score level was found in the respondents who received information. Assuming the respondents received the information from public health sectors and mass media were more likely to practice better to prevent themselves against the disease contraction ($p<0.01$). Obviously, there was a difference in proportion of the respondents between who raised and did not raise poultry. The respondents who raised domestic fowl were more likely to practice correctly to prevent avian influenza ($p<0.001$). Similarly, there was a great difference in proportion between the respondents who slaughtered and did not slaughter the poultry. The respondents who slaughtered the poultry were more likely to have correctly practiced to prevent the disease ($p<0.05$). Because of persons who slaughtered the poultry usually bewared themselves since they knew to have more likely to get AI infection than who did not slaughter the poultry.

5) Relationship between knowledge, attitudes and practices toward prevention and control of avian influenza

The levels of knowledge versus levels of attitude of respondents (Table 19). The proportion of the respondents who had medium level of knowledge was higher

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than others to have positive attitudes. The association between knowledge and levels of attitudes was statistically significant ($p < 0.05$).

The levels of attitudes versus levels of practice of respondents (Table 20). The proportion of the respondents who had positive attitudes was greater than those who had negative attitudes to practices rightly about avian influenza prevention. The association between attitudes and practices was statistically significant ($p < 0.05$).

The levels of knowledge versus levels of practices of the respondents (Table 21). The proportion of the respondents who had knowledge of avian influenza was more likely to have good practices to prevent avian influenza. However, the association between knowledge and practices was not statistically significant ($p > 0.05$).

These findings were congruent to model of relationship in the first type of relationship was Knowledge (K) has affected on Attitude (A), which affected on Practice (P). The model was concluded by Manoonpiju Nipa (41).

2.2 Phase II

The first objective: To prepare community stakeholders and develop an empowerment program to be ready for phase II implementation.

The preparation community stakeholders comprise of three basic activities, firstly, gathering of baseline data about the study villages (community diagnosis), secondly, identified key community stakeholders, and thirdly, conducted the village survey regarding avian influenza. Baseline data about the structure of study villages as well as their information in relation to avian influenza prevention and control was gathered prior to identifying the key community stakeholders. The following information was assessed: - present community structure, environmental condition regarding raising poultry, socio-cultural and economic status of the community, community activities in prevention and control practices that was emphasized on carcass elimination as well as health care services and traditional practices commonly available in the community. Information about avian influenza prevention and control program of sub-district health center and from Tambon Administrative Organization

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(TAO) was also gathered. This information was mainly used for sharing and exchanging information with the key community stakeholders during the participatory learning action (PLA) process.

Identifying the key community stakeholders: the researcher, the sub-district health office, and village headmen cooperated to set the number of key community stakeholders who should participate in this project. There were totally 31 persons recruited into this study including 24 key community stakeholders and 7 facilitative stakeholders. However, the key community stakeholders and representatives of each household of the study villages were the prioritized group to cope with. After the key stakeholders were identified, they were categorized according to the type of participation at the different stages of the avian influenza prevention and control project activities in the action plan. At the planning, implementing, monitoring, and evaluating the project, the key community stakeholders fully participated and involved in this study.

Conducting the village survey regarding the avian influenza: Before conducting the village survey, the village map was drawn on the basis of existing map of Ban Long Tong Health Center. Community mapping was a useful tool for collecting information from the community concerning the location of avian influenza prevention and control activities. The technique so called “Transect-Walk” was used for drawing the map. Location of housing, area of cultural, household that raised animals and road were appeared on the map. After the community map was drawn, the village survey was conducted mainly at the household level since the household was the focal point in the control of risk factors leading to avian influenza. It was also the focal point of the study intervention. The information from the survey was used as baseline data for the following steps and for the pretest data.

The second objective: To implement the empowerment program in the group of key community stakeholders.

Researcher and staff trained 24 key community stakeholders who were village headman, village headman assistants, committee members of the village, members of the housewife group, members of the village security group, members of council

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Tambon Administrative Organization (TAO), and Technology Transfer Leadership of Thung-Khok Sub-district. Objective of the training was to enhance ability of the key community stakeholders. The training was performed two times. The first training was conducted on June 29, 2005. The contents of the first training included general situation and knowledge of avian influenza, role and responsibilities of themselves to prevent and control avian influenza in the study village. After one week from the first training, they returned to their home in order to find out the data and strategy for applying to write the avian influenza prevention and control plan in the second training. The second training was performed on July 8, 2005 (later one week after the first training). The data feedbacks were applied to write the plan of avian influenza prevention and control for the study village. The knowledge about the avian influenza and the experiences received from the two trainings. These were applied to write the action plan of avian influenza prevention and control. After finished the second training, the action plan was led to promptly action in the study village and it was submitted to the government official at the same time. This plan submitted because of we required financial support from the concerned governmental units.

The third objective: To measure changes of KAP on avian influenza, self-efficacy, necessary perception, self-esteem, satisfaction and people's participation in the activities of prevention and control of avian influenza among key community stakeholders and household representatives.

The data regarding the output variables, namely knowledge regarding on avian influenza, self-efficacy perception in prevention, necessarily perception to prevent and control avian influenza in the community, satisfaction and people's participation in the activities of prevention and control of avian influenza in the study village. After the program ended, the mean scores of all outcome variables of the experimental group were significantly higher than before the implementation program began (See the Table 24).

Comparison of KAP on avian influenza between the household representatives in Song Phi Nong District and Ban Vang Ta-Ku after implementation program

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Knowledge toward avian influenza

Knowledge was classified as incorrect or correct answer and was tested both in Song Phi Nong District and Ban Vang Ta-Ku after the interventional program. There were 18 items tested for the knowledge toward avian influenza. It was found that the respondents in Ban Vang Ta-ku had higher proportion of correct knowledge regarding avian influenza than the respondents in Song Phi Nong District in almost all items (Table 40 in appendix). It was because the household representatives of Ban Vang Ta-Ku obtained the knowledge regarding avian influenza from the key community stakeholders every month during implementation of the project activities.

Attitudes toward avian influenza

Attitude was used to measure their favorableness categorized as agreed, not sure, and disagreed. There were 17 items tested for the attitudes toward avian influenza. After the interventional program, it was found that the respondents in Ban Vang Ta-Ku had higher proportion of positive attitudes (agreed) than the respondents in Song Phi Nong District in almost all items (Table 41 in appendix). This was affected by the program activities in prevention and control of avian influenza which was performed by the key community stakeholders.

Practices toward avian influenza

Practices were categorized as all time, sometimes, and no practices. There were 15 items tested for the practices toward avian influenza. After the interventional program, it was found that the respondents in Ban Vang Ta-Ku had higher proportion of all time practices in the activities of prevention and control of avian influenza than the respondents in Song Phi Nong District in almost all items (Table 42 in appendix). This was affected by the participation of household representatives in prevention and control of avian influenza which was performed by the key community stakeholders.

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Self-efficacy in prevention and control of avian influenza in the study village

Concerning the finding, the household representatives' self-efficacy to do the best job in prevention and control of avian influenza in the village significantly changed (Table 33). This was the result of the CBEP. Bandura (10) stated that individuals created and developed self-efficacy beliefs as a result of the social persuasions they received from others. These persuasions could involve exposure to the verbal judgments that others provide. This study also found that all activities created belief which would influence behavior. For example, the learning experience of each household representative shared and discussed in monthly meeting in the village which was based on problem-solving in group, one of the classic activities. In the same style, Wallerstein's studies (57) showed that the empowerment program would supported the learners' self-efficacy.

Self-esteem in prevention and control in the study village

The self-esteem of key community stakeholders and household representatives after experimental program ended. Most of them had self-esteem in term of self-respect and self-confidence. These led to participate in the project activities and improved the practicing behaviors in the prevention and control of avian influenza in the village. Therefore, it supported Wallerstein's statement saying that establishing an empowerment program would lead to changes in knowledge, attitude and enhancement of self-esteem in individuals (57).

Concerning satisfaction and people's participation in the project activities, it was found that most of respondents had high satisfaction and participation in the practicing activities with 98.3% and 80.9%, respectively (See the Table 35,36). Besides, self-esteem was measured with the Rosenberg Self-Esteem Scale (85), which included ten items. Questions for assessment self-esteem were in an in-depth interview form. To measure the feeling of the key community members and household representatives who assessed themselves as they were significant and be accepted by the society. They also got ability to do something successfully. The summary of data from the in-depth interview household representatives and the key community

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stakeholders included 20 persons regarding their self-esteem, advantages, and benefits of the project activities after implementation program. We can summarize that most of informants had self-esteem in term of self-respect and self-confidence. These led to participate in the project activities and improved behaviors in the prevention and control of avian influenza in the community.

These changes in the experimental group were resulted from the community-based empowerment program that allowed the key community stakeholders to actively participate in continuing educational activities starting from conducting a community survey, identifying the problem, planning, action and observation, reflection, and re-planning with the facilitator stakeholders (the sub-district health officers and researcher). Representatives of each household weekly cleaned up the house and cages/coops with an assistance of the key community stakeholders of the village zone. The activities at the household level were more specific to each household context, specifically the household raised domestic poultry. During the outbreak of avian influenza starting among poultry at neighboring villages, the household representatives who raised domestic poultry with the key community members sprayed anti-septic solution in cages/coops and around those houses every three days to reduce the transmission of the disease to poultry and to human. Besides these activities, the learning experiences of each key community stakeholder shared and discussed in monthly meeting in the village. The experiences were used as the inputs for project activities monitoring and re-planning. This finding was supported by Jittasirinuvatra (86), Meesuk (87), and Therawiwat (88) that they studied regarding the community participation in dengue haemorrhagic fever prevention by using a community-based method for *aedes aegypti* larvae control.

The Advantages and Benefits of the Project Activities to the Village After Implementation Program.

The advantages and benefits of the project activities that the community received after the program ended. The summary of data from the in-depth interview derived from 10 household representatives and 10 key community stakeholders. All informants stated that the project activities in prevention and control of avian influenza

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provided more advantages to their communities included: (1) People increased knowledge of prevention of avian influenza, (2) Received more information about avian influenza, (3) Meet and exchange of opinion, (4) Unity of people occurred in the village where they can get together, and (5) The people cooperated each other in order to protect themselves from avian influenza. Regarding the benefits of the project activities that the village received after the implementation program ended. When the comparison between before and after the implementation all 20 informants stated that after the implementation program their village gained benefits from involving in the project activities including: (1) No one was infected from avian influenza, (2) People were active to prevent and control the disease, (3) More people participated in the activities than previous time, (4) The households that raised domestic poultry received anti-septic spray for their premises and animals, (5) People participated to prevent and to control avian influenza, and (6) Their village had surveillance network of avian influenza.

The Factors Influenced to People's Participation in the Project Activities of Prevention and Control of Avian Influenza in the Study Village.

The univariate analysis of factors associated with people's participation in the project activities of prevention and control avian influenza. It was found that the group who raised domestic poultry was more likely to participate in the project activities than those who did not raise domestic poultry. Participants who received information about avian influenza were little likely to participate in the project activities than who did not receive information. Subjects who had high level of practice scores toward avian influenza were slightly likely to participate in the project activities than those who had low level of practice scores. The respondents who had high level of self-efficacy scores toward avian influenza were likely to participate in the project activities than those who had lower level of self-efficacy scores (Table 37).

Variables that were significant in univariate analysis at a level of p-value $\leq .05$ were included in the multivariate model. Participants who had family income less than 5,000 Baht were likely to participate in the project activities than those who had family income more than 5,000 Baht. Participants who raised domestic poultry were

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little likely to participate in the project activities than those who did not raise domestic poultry. The respondents who had high level of self-efficacy scores toward avian influenza were significantly likely to participate in the project activities than those who had low level of self-efficacy scores (Table 38).

The Operation Model of Prevention and Control of Avian Influenza in Community

The Community-Based Empowerment Program (CBEP) emphasized participation of people in the community to operate the project activities. The government offices supported operating those activities. The mask and gloves had been supported from the Health Center. The anti-septic spray was supported from District Livestock Office and Sub-district Administration Organization. Whereas, the provincial governor allocated the budget for the anti-septic spray, and personal protective materials to distribute to people who raised poultry in the outbreak areas by passing through various government offices in the province and district level.

The key community members who were assigned for a responsibility zone performed the project activities. One key community member was responsible for 8-10 households. The activities of prevention and control of avian influenza were operated including, (1) surveillance and reporting occurrence of avian influenza both in poultry and in human cases. Counting number of ill or dead poultry whether known or unknown cause, and properly educated people regarding prevention and control of avian influenza, and including proper elimination of carcasses, (2) conducting monthly the meeting to exchange information, learn experiences among groups, consecutively, and following up the progress of implemented avian influenza prevention, problem solution or troubles in all conducted activities, (3) distributing mask, gloves, and anti-septic spray to the people who raised domestic poultry, and (4) spraying anti-septic in poultry barns of the people who raised domestic poultry during the outbreak of avian influenza.

The model could be helpful to create an awareness and consciousness of disease prevention in humans and to build a surveillance network of the disease in households' level of the community. This affected reduction of the incidence rate and

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promotion of preventive behaviors of avian influenza as well. These effects could be seen from the results of measurement variables output and outcome of this study. The effectiveness and efficiency of this model based on strength of surveillance network at the household level. If the report of the occurrence of the disease is done early both in poultry and human, the disease will be promptly prevented and controlled.

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CHAPTER VI

CONCLUSION AND RECOMMENDATIONS

6.1 CONCLUSION OF THE STUDY

The first phase was a cross-sectional analytic study to access knowledge, attitudes, and practices regarding prevention and control of avian influenza. Interviews were conducted with 784 respondents who lived in 42 villages of Song Phi Nong District, of which two villages were in the urban (municipality) and 40 were in the rural areas. The quantitative data collection was conducted by using the structured questionnaire. Then, there were 784 complete answers to analyze processing. STATA software program was used for data analysis. Frequency, percentage, mathematic mean, mode and standard deviation were calculated to describe general demographic characteristic information. Chi-square test was used to examine the relationships between socio-demographic characteristics and their knowledge, attitudes and practices toward avian influenza.

6.1.1 Phase I: KAP on Avian Influenza Survey in Song Phi Nong District

Most of respondents (85.1%) had an intermediate knowledge level. Concerning that the attitude levels, 98.9% were in a positive direction ranged in high levels. Respondents, 67.5%, were in intermediate appropriate practice levels. Personal hygiene and behaviors of hand washing of people, it was found that 86% washed their hands every time before meal and 54.6% among those washed hands with soap. In the study areas, 100% of households equipped with toilet, and all people had to using it. Among those, 92.5% washed hands every time after using toilet and 60.6% of those washed hands with soap. The majority (93.5%) washed their hands every time after handling or contacting the domestic poultry. Most (84.3 %) used soap to wash their

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hands. Approximately 68% of respondents used to involve with animal carcasses. Almost all of them (96.3%) responded that they washed their hands every time after handling carcasses and 74.0% used soap to wash their hands after work.

The respondents who never attended school and those who finished primary school had significantly higher percent of avian flu knowledge than those who finished high school or above ($p = 0.009$). The respondents who received information form media were more likely to have a better knowledge level ($p<0.001$) who did not receive the information about avian influenza. The lowest proportion in unfavorable attitudes was found in the respondents who earned less than 5,000 Baht, and the highest proportion was in favorable attitude among who earned 5,000 – 10,000 Baht per month ($p = 0.016$). The people receiving information from media were significantly higher proportion of favorableness than the people who were not ($p<0.001$). The respondents who had family income more than 10,000 Baht were more likely than other income groups to have good practice to prevent avian influenza ($p<0.05$).

6.1.2 Phase II: Action Research and Implementation

The second phase was one group pretest-posttest action research, conducted in a selected community. Both quantitative and qualitative data were collected before, after, and during the implementation. Twenty four key community stakeholders of Vang Ta-Ku village were selected as the study group. The key community members received training to enhance ability of them. The training was performed two times. The contents of the first training included general situation and knowledge of avian influenza, role and responsibilities of themselves to prevent and control avian influenza in the study village. After one week from the first training, they returned to their home in order to find out the data and strategy for applying to write the avian influenza prevention and control plan in the second training. The second training, the data feedbacks were applied to write the plan of avian influenza prevention and control for the study village. The knowledge about the avian influenza and the experiences received from the two trainings. These were applied to write the action plan of avian influenza prevention and control. After finished the second training, the

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action plan was led to promptly action in the study village and it was submitted to the government official at the same time.

The data regarding the output variables, namely, knowledge, attitudes, and practices on avian influenza, hand washing with soap, perceived self-efficacy, and perceived necessary perception to prevent avian influenza strongly supported the effectiveness of the program. After the program, the mean scores of all the output variables of the experimental group were significantly higher than before the experimental program. These changes of the experimental group were resulted from the community-based empowerment program that allowed the key community stakeholders to actively participate in continuing educational activities starting from conducting a community survey, identifying the problem, planning, action and observation, reflection, and re-planning with the Ban Long Tong health officers and researcher.

Self-esteem

Self-esteem was measured with the Rosenberg Self-Esteem Scale (88), which includes ten items. In-depth interview was used to assess self-esteem. To measure the feeling of the key communities and household representatives who assessed themselves as they were significant and be accepted by the society and they also got ability to do something successful. The summary of data from the in-depth interview of household representatives and the key community stakeholders totaled 20 persons regarding their self-esteem after experimental program. We could summarize that most of informants had self-esteem in term of self-respect and self-confidence. These led to participate in the project activities and improved the practicing behaviors in the prevention and control of avian influenza in the community.

Summary of the satisfaction and people's participation in the project activities of prevention and control avian influenza in the community after implementation program

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The data regarding the outcome variables namely the satisfaction and people's participation in the project activities of prevention and control of avian influenza in the community. The satisfaction was classified into 3 categories, high, moderate, and low. The majority of household representatives had high satisfaction to the project activities and to performance of the key community members in prevention and control of avian influenza in the community (98.3 %). Regarding the participation of people, it was found that more than 80 % of household representatives knew toward the action of activities in prevention and control of avian influenza that was assigned by the key community members and 80.2 % received the information from them. The people's participation in the action of prevention and control of avian influenza, three-fourth of household representatives cooperated in the activities, and almost all of them attended the monthly meeting (96 %). The information regarding avian influenza in the village, it showed that more than 80% of participants broadcasted information of avian influenza also reached to other people, and most of information broadcasted to their kindred in the village (68.7%).

The advantages and benefits of the project activities that affect to the community after implementation program.

The advantages and benefits of the project activities that the community received after the program ended. The summary of data from the in-depth interview derived from 20 persons, 10 household representatives and 10 the key communities. All informants (20 persons) stated that the project activities in prevention and control of avian influenza provided many advantages to their communities of the advantages included: (1) People had knowledge in prevention avian influenza, (2) Received the information about avian influenza, (3) Meet and exchange opinion, (4) Unity of people occurred in the village, and (5) The people cooperated in order to protect themselves from avian influenza. Regarding the benefits of the project activities that their village received after the experiment program ended. When considering the comparison between before and after the implementation program. All informants (20 persons) stated that after the implementation program their village gained benefits from involving in the project activities. The benefits they stated included: (1) No one was

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infected by avian influenza in the village, (2) People were active to prevent and control avian influenza, (3) More people participated in the activities than previous time, (4) The household that raised domestic poultry received the anti-infective virus spraying for prevention and control of avian influenza, (5) People participated to prevent and control avian influenza, and (6) Their village had network surveillance of avian influenza.

The Factors Influenced to People's Participation in the Project Activities of Prevention and Control Avian Influenza in the Study Village.

The univariate analysis of factors associated with people's participation in the project activities of prevention and control of avian influenza in the study village, it was found that the variables affected to people's participation in the project activities including, raising domestic poultry, receiving information from media about avian influenza, high level of practice scores toward avian influenza, and high level of self-efficacy scores toward avian influenza (Table 37). Variables that were significant in univariate analysis at a level of p-value $\leq .05$ were included in the multivariate model. These variables included, level of family income, raising domestic poultry, and high level of self-efficacy scores toward avian influenza (Table 38).

The effectiveness of model in prevention and control of avian influenza in community

The program was quite successful, with KAP levels for avian influenza, hand washing with soap behaviors, self-efficacy, and necessary perception of prevention and control, significantly higher than before the implementation program. Householder satisfaction and participation in the activities had higher levels to the project activities (98.3 and 80.9%, respectively). Logistic regression model suggested that self-efficacy score, practice score, raising poultry, and learning information, predicted increased chance of program participatory activities.

Therefore, this model could also be applied to other communities with a high incidence of avian influenza in poultry. Furthermore, the model affected the reduction

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of risk behaviors of people in community and promotion of preventive behaviors of avian influenza as well.

6.2 RECCOMMENTDATIONS

The results of this study clearly recommend that:

1) In implementing avian influenza prevention and control program at the community level, the key community stakeholders should actually involved at the beginning of the program.

2) The key community stakeholders should be recruited under the existing community administrative structure and come from members of various groups. In addition, every section or community zone must be voluntary involved.

3) The key community stakeholders must be empowered through the active continuity participatory learning in the community.

4) According to the avian influenza prevention and control program, the activities must be implemented at the grass root especially environmental sanitation improvement in and around the house. People must clean or spray anti-septic solution in the cages/coops/farms, and eliminate carcasses of sickness or dead animals. Each household representative should be identified to responsible for his or her household since the effective prevention and avian influenza surveillance network are constructive at the household level.

5) The avian influenza program activities must be followed up and monitored periodically, if possible. It should be done on monthly basis. In this study the monitoring through monthly meetings in the community was quite crucial for motivating the key community stakeholders to reflect their learning experiences and to adjust their program activities.

6) The avian influenza community program must be directly supported by health center officers, livestock officers, and also from district and provincial level.

7) Tumbon Administration Organization should involve more in avian influenza prevention and control program of the community since it is the legal local administrative organization, a smallest unit which is to take care the place where the people's living.

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6.3 RECOMMENDATION FOR FURTHER STUDY

1. Action research should be employed to empower the community in organizing avian influenza prevention and control program by applying empowerment theory for the key community stakeholders. The target group should consist of related persons, such as village headman, members of Sub-district Administration Organization, village health volunteers, committee members of the village, members of housewife group, members of village security group, and other organizations in the community. These groups affected to the effectiveness and efficiency of a program.

2. The study model for organizing avian influenza prevention and control program should be in mode to find the appropriate method to solve and prevent avian influenza in the community.

3. The study model affected the reduction of risk behaviors and promotion of prevention behaviors of avian influenza as well. Therefore, the model should be expanded to cover in the risk areas where the avian influenza occurred in poultry to prevent spread of avian influenza from poultry to human.

4. The effectiveness and efficiency of prevention and control of avian influenza in the community based on strength of surveillance network at the household level. If the report of the occurrence of the disease is done early both in poultry and human, the disease will be promptly prevented and controlled.

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APPENDIX A

THE SANITARY CHICKEN PROJECT IN THAILAND (89)

The objective

The objective of this project was to monitor poultry health nationwide by means of an active surveillance by collecting samples and testing in the laboratory. The areas of operation were divided into two zones, Control zone and Surveillance zone.

1. Control zone

Definition of control zone: The area within 50 kilometers radius from HPAI infected farms

1.1 Breeding stock farms, broiler farms, layer farms and all other bird farms that has characteristics of a farm

Guidelines for sample collection

- Six cloacal swab tubes are randomly collected from each farm. (One cloacal swab tube is a pooled sample collected from 5 animals which would mean the six swab tubes will come from 30 animals)
- Six cloacal swab tubes are randomly collected from each farm. (one cloacal swab tube is a pooled sample collected from 5 animals which would mean the six swab tubes will come from 30 animals)
- Layer farms and farms that are not under the management of a company, personnel from the Department of Livestock Development are responsible for collecting the samples.

1.2 Native chicken and all possible carrier birds

Guidelines for sample collection

Collected samples were from every village in the area

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Personnel from the Department of Livestock Development collect one cloacal swab tube per one village (One cloacal swab sample is a pooled sample which means one tube will come from five birds)

2. Surveillance zone

Definition of Surveillance zone: Areas that are not included in the Control zone

2.1 Breeding stock farms, broiler farms, layer farms and all other bird farms that has the characteristic of a farm

Guideline for sample collection

- Twelve cloacal swab tubes are randomly collected from each farm. (one cloacal swab tube is a pooled sample collected from 5 animals which would mean the twelve swab tubes will come from 60 animals)
- Broiler farms for export, duck farm for exports, breeding stock and broiler farms should have the sample collected and send to private laboratory under the control of the Department of Livestock development. However if there are no laboratories available, send the sample to National Institute of Animal Health.
- Layer farms and farms that are not under the management of a company, personnel from the Department of Livestock Development will be responsible for collecting the samples.

2.2 Native chicken and all birds that carry the disease

Guideline for sample collection*:* collect one tube for each village and sixty villages for each province by calculating the ratio of the size and location each village to get samples that best represent the province.

Example Province Number 1 has 4 districts, district A has 100 villages, district B has 400 villages, district C has 300 villages and district D has 200 villages. So, the samples would be 6 from village A, 24 from village B, 18 from village C and 12 from village D.

The personnel from the Department of Livestock development will collect the cloacal swab using one tube per one village. (One cloacal swab tube sample is a pooled sample which means one tube will come from five birds)

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3. Sending the sample to the laboratory

3.1 Send the sample in a container at 4oC and fill in the information as in the Newcastle disease project according to the area as follow

- Broiler farms for export and companies without laboratory can send sample
  to National Institute of Animal Health.
- Provinces in the area of Regional Bureau Animal Health and Sanitary 1 send sample to National Institute of Animal Health
- Provinces in the area of Regional Bureau Animal Health and Sanitary 2 send sample to Eastern Veterinary Research and Development Center Chonburi province
- Provinces in the area of Regional Bureau Animal Health and Sanitary 3 send sample to Upper Northeastern Veterinary Research and Development Center Khorn Kaen province
- Provinces in the area of Regional Bureau Animal Health and Sanitary 4 send sample to Lower Northeastern Veterinary Research and Development Center Surin province
- Provinces in the area of Regional Bureau Animal Health and Sanitary 5 send sample to Northern Veterinary Research and Development Center Lumpang province
- Provinces in the area of Regional Bureau Animal Health and Sanitary 6 send sample to Lower Northern Veterinary Research and Development Center Pisanulook province
- Provinces in the area of Regional Bureau Animal Health and Sanitary 7 send sample to Western Veterinary Research and Development Center Ratchaburi province
- Provinces in the area of Regional Bureau Animal Health and Sanitary 8 and 9 send sample to Southern Veterinary Research and Development Center Nakhorn Si Thamarat

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3.2 Send the samples every day; do not send them all at once, whereby

- Regional Bureau Animal Health and Sanitary 1 expects approximately 4,700 tubes each round
- Regional Bureau Animal Health and Sanitary 2 expects approximately 1,840 tubes each round
- Regional Bureau Animal Health and Sanitary 3 expects approximately 800 tubes each round
- Regional Bureau Animal Health and Sanitary 4 expects approximately 1,600 tubes each round
- Regional Bureau Animal Health and Sanitary 5 expects approximately 1,600 tubes each round
- Regional Bureau Animal Health and Sanitary 6 expects approximately 3,400 tubes each round
- Regional Bureau Animal Health and Sanitary 7 expects approximately 1,870 tubes each round
- Regional Bureau Animal Health and Sanitary 8 expects approximately 1,060 tubes each round
- Regional Bureau Animal Health and Sanitary 9 expects approximately 250 tubes each round

4. Sample collecting equipment

The equipment will be provided by the Regional Veterinary Research and Development Center

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APPENDIX B

The following table presented time schedules for a Community-Based Empowerment Program and data were obtained during the study.

Table 39 Data Showing Chart Flow in the Community-based Empowerment Program

Time schedules (Months)	Data/Indicators	Objectives of the activities and Using Information	Methods/ Techniques
M 1	**Input** ***Conducting pre-survey about:** - Present community infra-structure - Socio-cultural and economic status of the community - Environmental conditions regarding reservoir places - Community activities about avian influenza prevention and control measures - Health care services - Supportive activities from local authorities	- To study basic information for developing the appropriate study processes.	- Ground -Walking -In-depth Interview and Observation
M 1	- Identifying key community stakeholders	- To identify stakeholders' interests, importance and influence over the implementation. - To provide a foundation and strategy for the key stakeholders participation. - To assess risk in getting avian influenza.	- In-dept interview
M 1-2	- Conducted risk area survey - Map of the community	- To know the exact location of possible distribution agent place.	- Transect-Walking in risk area and performing domestic animal reservoir survey and observation

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Table 39 Data Showing Chart Flow in the Community-based Empowerment Program (Cont).

Time schedules (6 Months)	Data / Indicators	Objectives of the activities and Using Information	Methods
M 2	- Empowering the key community stakeholders through the community-based Empowerment Program (CBEP)	- To empower the key stakeholders their confidence and capability in prevention and control of avian influenza	- Participatory learning & action - Group discussion - Brainstorming - Problem solving process
M 2 - 6	Process 1. The key stakeholders action regarding bird flu prevention and control as following four-process cycle 1) The key stakeholders plan avian influenza prevention and control projects for their community and the household level 2) The key stakeholders with household representatives implement their avian influenza projects 3) The key stakeholders with household representatives assess their avian influenza projects 4) The key stakeholders with household representatives reflect bird activities and their learning 2. The ongoing CBEP (the key stakeholders meeting every 1 month)	- To develop and implement a practical projects. - To revise the plan of the avian influenza project - To find a better solution.	- Home visit - Participatory learning & action - Group discussion - Brainstorming - Problem solving process - Monthly meeting

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Table 39 Data Showing Chart Flow in the Community-based Empowerment Program (Cont).

Time schedules (6 Months)	Data / Indicators	Objectives of the activities and Using Information	Methods
M 2-6	- Doing Daily Report (reporting suspected patients, sick and dead animals and destroying carcass) - Conducting to improve environmental sanitation in/around house and cage/coop, and sprayed anti-infective avian influenza virus substance in cage/coop.	- To surveillance the disease - To follow up the project activities of the key communities and household representatives - To control the environment in the families and the communities so that it was not suitable as distributing agent sites of avian influenza	- Daily Report and doing the activities report by the key communities - Transect Walking in risk places or domestic poultry reservoirs survey and - Observation
M 6	Output - Knowledge, attitudes and behavioral practices, self-efficacy, necessary perception of prevention and control avian flu, and self-esteem. Outcome - Satisfaction and people's participation in the project activities. - advantage and benefit of the project activities	Output -To assess the changes of knowledge, attitudes and practices, self-efficacy, necessary perception regarding the prevention and control avian influenza, and self-esteem among the stakeholders after the CBEP implementation. Outcome - To study the effectiveness of a community-based empowerment program (CBEP) by assessment satisfaction, people's participation, advantage, and benefit of the project activities among the stakeholders after the CBEP implementation.	- Interview and in-depth interview - Interview and In-depth interview

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Table 40 Comparison of knowledge regarding avian influenza between the household representatives in Song Phi Nong District and Ban Vang Ta-Ku before and after implementation program.

Knowledge on avian influenza		Overall District		Ban Vang Ta-Ku			
				Pretest		Posttest	
		No	%	No	%	No	%
1. Major signs and symptoms of avian influenza.	Correct	2	0.3	69	34.7	122	61.3
	Wrong	782	99.7	130	65.3	77	38.7
2. Causative agent of avian influenza	Correct	346	44.1	60	30.2	139	69.8
	Wrong	438	55.9	139	69.8	60	30.2
3. Modes of transmission of avian influenza : Direct contact of avian or infected animal	Correct	66	8.4	144	72.4	175	87.9
	Wrong	718	91.6	55	27.6	24	12.1
4. Who eat uncooked meat of dead chicken or contact dead chicken?	Correct	19	2.4	166	83.4	189	95.0
	Wrong	765	97.6	33	16.6	10	5.0
5. Indirect contact of secretion of infected animal.	Correct	40	5.1	153	76.9	179	89.9
	Wrong	744	94.9	46	23.1	20	10.1
6. Avian influenza can transmit by person to person.	Correct	44	5.6	22	11.1	67	33.7
	Wrong	740	94.4	177	88.9	132	66.3
7. Avian influenza can be transmitted.	Correct	539	68.8	119	59.8	162	81.4
	Wrong	245	31.3	80	40.2	37	18.6
8. Avian influenza is a communicable disease.	Correct	467	59.6	113	56.8	152	76.4
	Wrong	317	40.0	86	43.2	47	23.6
9. The highest risk of avian influenza was direct contact of infected or dead animal as well as eating dead chicken meat.	Correct	725	92.5	172	86.4	192	96.5
	Wrong	59	7.5	27	13.6	7	3.5
10. Avian influenza can be treated.	Correct	541	69.0	117	58.8	158	79.4
	Wrong	243	31.0	82	41.2	41	20.6

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Table 40 Comparison of knowledge regarding avian influenza between the household representatives in Song Phi Nong District and Ban Vang Ta-Ku before and after implementation program (Cont).

Knowledge on avian influenza	Overall District		Ban Vang Ta-Ku			
			Pretest		Posttest	
	No	%	No	%	No	%
11. Avian influenza can cause illness and dead.						
Correct	756	96.4	182	91.5	198	99.5
Wrong	28	3.6	17	8.5	1	0.5
12. Prevention method for avian influenza infection is no contact with sick or dead chicken.						
Correct	756	97.6	188	94.5	193	97.0
Wrong	19	2.4	11	5.5	6	3.0
13. Wearing safeguard when contacting sick chicken.						
Correct	764	97.4	187	94.0	194	97.5
Wrong	20	2.6	12	6.0	5	2.5
14. Wearing safeguard when contacting with carcass.						
Correct	764	97.4	188	94.5	195	98.0
Wrong	20	2.6	11	5.5	4	2.0
15. Children and elderly are the highest susceptibility to infect avian influenza in the contaminated area.						
Correct	731	93.2	164	82.4	165	82.9
Wrong	53	6.8	35	17.6	34	17.1
16. Highest risk is direct contact of infected or dead animal as well as eating dead chicken meat.						
Correct	764	97.4	180	90.5	193	97.0
Wrong	20	2.6	19	9.5	6	3.0
17. Vaccination for poultry affects mutation of avian influenza virus.						
Correct	264	33.7	44	22.1	134	67.3
Wrong	20	2.6	155	77.9	65	32.7
18. People who contact the poultry are risk of avian influenza.						
Correct	761	97.1	182	91.5	193	97.0
Wrong	23	2.9	17	8.5	6	3.0

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Table 41 Comparison of attitudes regarding avian influenza between the household representatives in Song Phi Nong District and Ban Vang Ta-Ku before and after implementation program.

Attitudes	Overall District		Ban Vang Ta-Ku			
			Pretest		Posttest	
	No	%	No	%	No	%
1. You are a concern to the avian influenza.						
Agree	509	64.9	139	69.8	145	72.9
Not sure	45	5.7	13	6.5	5	2.5
Disagree	230	29.3	47	23.6	49	24.6
2. Avian influenza is a preventable disease.						
Agree	754	96.2	182	91.5	194	97.5
Not sure	23	2.9	12	6.0	3	1.5
Disagree	7	0.9	5	2.5	2	1.0
3. Eating sick or dead chicken meat is risk to avian influenza.						
Agree	762	97.2	185	93.0	197	99.0
Not sure	16	2.0	12	6.0	2	1.0
Disagree	6	0.8	2	1.0	0	0.0
4. People who eat uncooked dead chicken meat or contact with dead chicken can get avian influenza.						
Agree	765	97.6	182	91.5	196	98.5
Not sure	15	1.9	15	7.5	3	1.5
Disagree	4	0.5	2	1.0	0	0.0
5. People who contacting poultry, killing, selling, transferring, disposing carcass, children playing with poultry, are more likely to get avian influenza infection than people who never contacting poultry.						
Agree	767	97.8	186	93.5	193	97.0
Not sure	13	1.7	12	6.0	6	3.0
Disagree	4	0.5	1	0.5	0	0.0
6. People who get common cold with high fever, chill, sore throat, cough, and fatigue may be infected by avian influenza.						
Agree	476	60.7	123	61.8	182	91.5
Not sure	248	31.6	59	29.6	15	7.5
Disagree	60	7.7	17	8.5	2	1.0

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Table 41 Comparison of attitudes regarding avian influenza between the household representatives in Song Phi Nong District and Ban Vang Ta-Ku before and after implementation program (Cont).

Attitudes	Overall District		Ban Vang Ta-Ku			
			Pretest		Posttest	
	No	%	No	%	No	%
7. Hand washing with soap after contact with poultry could prevent avian influenza.						
Agree	734	93.6	173	86.9	186	93.5
Not sure	23	2.9	17	8.5	10	5.0
Disagree	27	3.4	9	4.5	3	1.5
8. Consumption of fully cooked chicken meat and eggs can protect the infection of avian influenza.						
Agree	767	97.8	192	96.5	194	97.5
Not sure	11	1.4	7	3.5	4	2.0
Disagree	6	0.8	0	0.0	1	0.5
9. Children and elderly or immune suppressing are susceptible to infection easier than the normal person.						
Agree	757	96.6	185	93.0	191	96.0
Not sure	17	2.2	11	5.5	6	3.0
Disagree	10	1.3	3	1.5	2	1.0
10. People who fed fighting roosters and had close association especially with contaminated areas are population at risk to be infected from avian influenza.						
Agree	730	93.1	187	94.0	179	89.9
Not sure	28	3.6	9	4.5	17	8.5
Disagree	26	3.3	3	1.5	3	1.5
11. Wearing mask, gloves, goggle and boot while working in poultry farm or keeping animal carcass to dispose can protect infection of avian influenza.						
Agree	756	96.4	190	95.5	196	98.5
Not sure	15	1.9	8	4.0	2	1.0
Disagree	13	1.7	1	0.5	1	0.5

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Table 41 Comparison of attitudes regarding avian influenza between the household representatives in Song Phi Nong District and Ban Vang Ta-Ku before and after implementation program (Cont).

Attitudes	Overall District		Ban Vang Ta-Ku			
			Pretest		Posttest	
	No	%	No	%	No	%
12. Housewives and chefs play an important role in the prevention of avian influenza. They must fully cook, and always sanitize.						
Agree	754	96.2	184	92.5	199	100.0
Not sure	14	1.8	8	4.0	0	0.0
Disagree	16	2.0	7	3.5	0	0.0
13. At present, are you at risk to avian influenza?						
Agree	209	26.7	41	20.6	115	57.8
Not sure	76	9.7	36	18.1	25	12.6
Disagree	499	63.6	122	61.3	59	29.6
14. At present, are your family members at risk to avian influenza?						
Agree	213	27.2	42	21.1	114	57.3
Not sure	74	9.4	41	20.6	27	13.6
Disagree	497	63.4	116	58.3	58	29.1
15. The confirmed infectious poultry with avian influenza will be immediately killed or eliminated to prevent the spread out of avian influenza infection to other kinds of poultry.						
Agree	731	93.2				
Not sure	23	2.9	179	89.9	192	96.5
Disagree	30	3.8	13	6.5	3	1.5
			7	3.5	4	2.0
16. When there are domestic poultry get sick and died with unknown cause more than one case within one day, a relevant person must inform the livestock officer to take carcass tested and eliminated.						
Agree	732	93.4	176	88.4	193	97.0
Not sure	19	2.4	20	10.1	3	1.5
Disagree	33	4.2	3	1.5	3	1.5
17. Relatives or persons who have close relationship with a patient who have high fever, chill, sore throat and cough, must not contact mucous and saliva and other secretion of the patient.	700	89.3	155	77.9	192	96.5
Agree	55	7.0	35	17.6	6	3.0
Not sure	29	3.7	9	4.5	1	0.5
Disagree						

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Table 42 Comparison of practices regarding avian influenza between the household representatives in Song Phi Nong District and Ban Vang Ta-Ku before and after implementation program.

Practices	Overall District		Ban Vang Ta-Ku			
			Pretest		Posttest	
	No	%	No	%	No	%
1. Do you purchase only chicken and chicken products from guaranteed or standardized shop?						
All time	129	16.5	27	13.6	9	4.5
Sometimes	244	31.1	40	20.1	50	25.1
No practice	411	52.4	132	66.3	140	70.4
2. Do you immediately go to the physician or health worker when you get common cold with high fever, chill, sore throat, and cough, especially during the outbreak in poultry population?						
All time	581	74.1	136	68.3	167	83.9
Sometimes	97	12.4	42	21.1	25	12.6
No practice	106	13.5	21	10.6	7	3.5
3. Do you immediately take your family member who get common with high fever, chill, sore throat, and cough to the physician or health worker, especially during the outbreak in poultry population?						
All time	587	74.9	146	73.4	169	84.9
Sometimes	95	12.1	39	19.6	23	11.6
No practice	102	13.0	14	7.0	7	3.5
4. Do you advise your family members when they get common cold to prevent spread of disease to other persons?						
All time	452	57.7	82	41.2	183	92.0
Sometimes	138	17.6	68	34.2	10	5.0
No practice	194	24.7	49	24.6	6	3.0
5. Do you purchase sick chicken with cyanosis, ruffled feathers, snivel, diarrhea etc., or dead chicken slaughtered for sale?						
All time	12	1.5	3	1.5	26	13.1
Sometimes	4	0.5	2	1.0	7	3.5
No practice	768	98.0	194	97.5	166	83.4

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Table 42 Comparison of practices regarding avian influenza between the household representatives in Song Phi Nong District and Ban Vang Ta-Ku before and after implementation program (Cont).

Practices	Overall District		Ban Vang Ta-Ku			
			Pretest		Posttest	
	No	%	No	%	No	%
6. Do you always protect yourself properly before contacting sick poultry or dead by wearing the personal protection equipment (gloves, glasses, a mask, an apron, a pair of boots)?						
All time	377	48.1	89	44.7	146	73.4
Sometimes	47	6.0	14	7.0	8	4.0
No practice	360	45.9	96	48.2	45	22.6
7. Do you take a bath or a shower, and change new cloths, after work?						
All time	280	35.7	84	42.2	141	70.9
Sometimes	57	7.3	16	8.0	12	6.0
No practice	447	57.0	99	49.7	46	23.1
8. Do you always disinfect or clean the personal protection equipment (e.g. the dirty clothes, apron, mask, gloves, glasses, and have them dried in the sunlight) before re-using?						
All time	378	48.2	85	42.7	142	71.4
Sometimes	39	5.0	13	6.5	11	5.5
No practice	367	46.8	101	50.8	46	23.1
9. At present, do you eat soft-boiled or uncooked eggs?						
All time	19	2.4	7	3.5	28	14.1
Sometimes	19	2.4	6	3.0	16	8.0
No practice	746	95.2	186	93.5	155	77.9
10. Do you continuously clean cages with detergent and water at least once a week?						
All time	189	24.1	42	21.1	106	53.3
Sometimes	68	8.7	27	13.6	26	13.1
No practice	527	67.2	130	65.3	67	33.7

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Table 42 Comparison of practices regarding avian influenza between the household representatives in Song Phi Nong District and Ban Vang Ta-Ku before and after implementation program (Cont).

Practices	Overall District		Ban Vang Ta-Ku			
			Pretest		Posttest	
	No	%	No	%	No	%
11. Do you keep a close watch on children by warning them not to handle any chickens or birds and not to carry any carcasses?						
All time	624	79.6	143	71.9	149	74.9
Sometimes	35	4.5	11	5.5	21	10.6
No practice	125	15.9	45	22.6	29	14.6
12. Do you always eat fully cooked chicken meat and eggs (for protection the infection of avian influenza)?						
All time	770	98.2	195	98.0	186	93.5
Sometimes	7	0.9	4	2.0	6	3.0
No practice	7	0.9	0	0.0	7	3.5
13. Do you always fully cook food before eating (to protect the infection of avian influenza)?						
All time	772	98.5	197	99.0	191	96.0
Sometimes	5	0.6	2	1.0	5	2.5
No practice	7	0.9	0	0.0	3	1.5
14. Can you properly practice yourself following the regulations of avian influenza prevention by washing hand with soap before eating food, eating fully cooked food, not direct contact with sick and dead chicken?						
All time	766	97.7	176	88.4	190	95.5
Sometimes	12	1.5	19	9.5	6	3.0
No practice	6	0.8	4	2.0	3	1.5
15. Can your family members properly practice themselves following the regulations of the avian influenza prevention?						
All time	757	96.6	174	87.4	191	96.0
Sometimes	21	2.7	20	10.1	5	2.5
No practice	6	0.8	5	2.5	3	1.5

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PICTURES OF ACTIVITIES

Process of data collection

Meeting organized for health personnel at Song Phi Nong District Health Office to prepare data collection

Training of interviewers

Training of key community stakeholders

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Group discussion and brain storming of key community stakeholders to write avian influenza prevention action plan

Culturally raising fighting roosters in the study villages

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The villagers joined monthly meeting

The free-range duck raising (Phed Lai Thung) are expecting to spread avian influenza virus to environment and flocks pursue problem to control the avian influenza (H5N1) in Thailand.

Phed Lai Thung in Ban Vang Ta-Ku

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APPENDIX C

Daily report

For surveillance of Avian Influenza in human and animal in the contaminated area

Ban Vang Ta – Ku No. 8, Thung Khok Sub-district, Song Phi Nong District, Suphan Buri Province

Number of patients suspected of Avian Influenza categorized on daily basis

Types	Month..Year.																												
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Suspected AI																														
Probable AI																														
Sick or dead poultry																														
Animal carcass disposal																														

Suspected cases, which include patients with the following symptoms

- Fever (body temperature of 38 degrees Celsius or higher); in addition to
- One of the following symptoms – muscle ache, cough, abnormal breathing (unusual breathing difficulty), or suspected of pneumonia by physician, or influenza; in addition to
- History of direct contact with infected / dead birds in the past 7 days or occurrence of unusual death of birds in the community within the past 14 days; or contact with a pneumonia patient or another patient suspected of Avian Influenza.

Probable Case, which include the above mentioned symptoms of suspected cases, in addition to:

- Preliminary test shows infection of influenza group A, but cannot yet be confirmed whether it is influenza from humans or birds.
- Respiratory failure
- Death

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APPENDIX D:

RESEARCH INSTRUMENTS

- INTERVIEWING QUESTIONNAIRE SERIES I FOR KAP SURVEY ABOUT AVIAN INFLUENZA PREVENTION AND CONTROL
- INTERVIEWING QUESTIONNAIRE SERIES II FOR PRETEST IN HOUSEHOLD REPRESENTATIVES, KEY COMMUNITIES AND ALSO POSTTEST KEY COMMUNITIES MEASUREMENT ABOUT AVIAN INFLUENZA PREVENTION AND CONTROL PROGRAM FOR
- INTERVIEWING QUESTIONNAIRE SERIES II FOR POSTTEST IN HOUSEHOLD REPRESENTATIVES GROUP MEASUREMENT ABOUT AVIAN INFLUENZA PREVENTION AND CONTROL PROGRAM
- IN-DEPTH INTERVIEW GUIDELINE FOR KEY COMMUNITY STAKEHOLDER REGARDING BASELINE DATA OF VANG TA-KU VILLAGE, THUNG SUB-DISTRICT
- IN-DEPTH INTERVIEW TOWARD THE RESPECT AND SELF-ESTEEM OF KEY COMMUNITY AND HOUSEHOLD REPRESENTATIVE

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Interviewing Questionnaire Series I

Interviewing Questionnaire for KAP Survey about Avian Influenza Prevention and Control in household representatives group

Instruction: Please mark √ in the provided box [ ] or fill in the blank if applicable.

1. ID number of the respondent □□□□□

2. Date of Interview...

3. Name of respondent...

4. Present Local Address: Household No ....Village No. ......
   Tambon ...., District ....Suphan Buri Province.

5. Name of Interviewer...

Part I Demographic Characteristics

1. Sex [ ] 1. .Male [ ] 2. Female
2. Age................years
3. What is your highest education level?
   - [ ] 1. Never attended school
   - [ ] 2. Primary grades 1 - 4
   - [ ] 3. Elementary grades 5 - 6
   - [ ] 4. Junior High school
   - [ ] 5. High school
   - [ ] 6. College
   - [ ] 7. Post graduate
   - [ ] 8. Others (specific)...

4. What is your marital status?

[ ] 1. Single	[ ] 2. Married	[ ] 3. Widow
[ ] 4. Divorced	[ ] 5. Separate	[ ] 6. others (specify)….

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5. What is your religion?

[ ] 1. Buddhist [ ] 2. Christian [ ] 3. Muslim

[ ] 4. Others (specify)……………………..

6. What is your primary job?

[ ] 1. Unemployment [ ] 2. Government officer

[ ] 3. Employee [ ] 4. Agriculturalist

[ ] 5. Student [ ] 6. Housewife

[ ] 7. Trade [ ] 8. Others (specify)……

7. What is your monthly household income? (Baht/month)

[ ] 1. < 5,000 [ ] 2. 5,000-10,000

[ ] 3. 10,001-15,000 [ ] 4. 15,001-20,000

[ ] 5. 20,001-25,000 [ ] 6. 25,001- 30,000

[ ] 7. > 30,000

8. How many children and elderly are there in your family have?

[ ] 1. No [ ] 2. Yes

Children: 0 - 5 years old………person

6 - 10 years old…….. person

11 - 15 years old…….person

Elderly: 60^{+} years old ………person

9. Where do you usually go to receive health care for yourself?

[ ] 1. Pharmacy [ ] 2. Public Health Center

[ ] 3. Private medical physician [ ] 4. Public Hospital

[ ] 5. Private Hospital

[ ] 6. Other (specify)…………………

10. How long does it take you to get to the above health care facility from your home?

[ ] 1. < 10 minutes [ ] 2. 10-30 minutes

[ ] 3. 30-60 minutes [ ] 4. > 60 minutes

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11. What kind of transportation do you generally use to go to the health care facility?

[ ] 1. Walking [ ] 2. Bicycle[ ] 3. Public car

[ ] 4. Private car [ ] 5. Motorboat [ ] 6. Motorbike

[ ] 7. Others (specify)…………………………………….

12. Do you live in your own house?

[ ] 1. No [ ] 2. Yes

13. What is your status in the family?

[ ] 1. head of the household [ ] 2. wife [ ] 3. son/daughter

[ ] 4. son/daughter-in-law [ ] 5. parents [ ] 6. others (specify)….

14. Which sources of information do you get to know about the bird flu?

[ ] 1. never received it from anyone or anywhere

[ ] 2. receive it from….(more than 1 answer).

[ ] 1. T.V. [ ] 2. radio [ ] 3. magazine [ ] 4. newspaper

[ ] 5. parents [ ] 6. lover [ ] 7. drug store [ ] 8. friend

[ ] 9. son/daughter [ ] 10. kindred

[ ] 11. health care worker (physician, nurse, etc.)

[ ] 12. Village Health Volunteer (VHV)

[ ] 13. others (specify)…………………………………………………

15. Do you raise animals?

[ ] 1. No (continuous asked item 16)

[ ] 2. Yes (If "Yes" to seventeen question answer in table)

16. If answer "No", Do you work in an animal farm?

[ ] 1 No

[ ] 2. Yes (Specify function)……………………..

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17. which type of the animal, the number, means of raising and contact with the animal do you have? (more than 1 answer)

Type of animal	Number	Means of raising the animal	Personal exposure	Other people In family exposure
Native chicken	………	□1. Nature raise □2. Open farm □3. Closed farm □4 Coop/Cage □5 Others (specify)………..	□1. Everyday □2. Sometimes □3. Seldom □4. No contact	□1 Oneself □2. Spouse □3. Children □4. Mother/Father □5. Others (specify)…
Fighting cocks	………	□1. Nature raise □2. Open farm □3. Closed farm □4 Coop/Cage □5 Others (specify)………..	□1. Everyday □2. Sometimes □3. Seldom □4. No contact	□1 Oneself □2. Spouse □3. Children □4. Mother/Father □5. Others (specify)…
Breed chicken	……….	□1. Nature raise □2. Open farm □3. Closed farm □4 Coop/Cage □5 Others (specify)………..	□1. Everyday □2. Sometimes □3. Seldom □4. No contact	□1 Oneself □2. Spouse □3. Children □4. Mother/Father □5. Others (specify)…
Egg chicken	………	□1. Nature raise □2. Open farm □3. Closed farm □4 Coop/Cage □5 Others (specify)………..	□1. Everyday □2. Sometimes □3. Seldom □4. No contact	□1 Oneself □2. Spouse □3. Children □4. Mother/Father □5. Others (specify)…
Duck	………	□1. Nature raise □2. Open farm □3. Closed farm □4 Coop/Cage □5 Others (specify)…………	□1. Everyday □2. Sometimes □3. Seldom □4. No contact	□1 Oneself □2. Spouse □3. Children □4. Mother/Father □5. Others (specify)……

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17. (Continuous)

Type of animal	Number	Means of feeding the animal	Personal exposure	Other people In family exposure
Geese		□1. Nature raise □2. Open farm □3. Closed farm □4 Coop/Cage □5 Others (specify)………	□1. Everyday □2. Sometimes □3. Seldom □4. No contact	□1 Oneself □2. Spouse □3. Children □4. Mother/Father □5. Others (specify)………
Quails		□1. Nature raise □2. Open farm □3. Closed farm □4 Coop/Cage □5 Others (specify)………	□1. Everyday □2. Sometimes □3. Seldom □4. No contact	□1 Oneself □2. Spouse □3. Children □4. Mother/Father □5. Others (specify)………
Others…		□1. Nature raise □2. Open farm □3. Closed farm □4 Coop/Cage □5 Others (specify)………	□1. Everyday □2. Sometimes □3. Seldom □4. No contact	□1 Oneself □2. Spouse □3. Children □4. Mother/Father □5. Others (specify)………

18. Where do you dispose your house garbage/refuse?

[ ] 1. Put on ground

[ ] 2. Collected as a heap

[ ] 3. Collected and buried

[ ] 4. Collected and burnt

[ ] 5. Threw in the canal

[ ] 6. Collected and refer to TAO/municipality

19. Have your family members killed poultry for consuming in your family?

[ ] 1. No (Don’t answer item 19.1-19.5) [ ] 2. Yes

19.1 Who has killed or cut the poultry mostly?

[ ] 1. Myself [ ] 2. Parents [ ] 3. Brother/sisters

[ ] 4. Son/daughter [ ] 5. Others (specify)………..

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19.2 Where were the poultry killed or cut mostly?

[ ] 1. basement [ ] 2. Kitchen

[ ] 3. Front yard [ ] 4. Others (specify)……….

19.3 By what methods were the poultry killed mostly?

[ ] 1. Hit head [ ] 2. Cut neck [ ] 3. Others (specify)……

19.4 By what methods was used to eliminate carcass or animals leftover?

[ ] 1. Burying [ ] 2. Burning [ ] 3. Feeding animals

[ ] 4. Throwing in the yard of house [ ] 5. Others (specify)…….

19.5 Do you always wear safeguard while killing or cutting poultry?

[ ]1. No

[ ] 2. Yes (specify)………

20. Where do you frequently purchase poultry or poultry meat for cooking in your family?

[ ] 1. Shop in the village [ ] 2. Raw – food market of municipality

[ ] 3. Raw – food market of TAO. [ ] 4. Department store

[ ] 5. Others (specify)…………………..

Part II Psychosocial Factors

Knowledge about Avian Influenza

21. What are the major signs and symptoms of bird flu?

[ ] 1. High fever, chill, headache, myalgia, prostration, sore throat, and cough.

[ ] 2. Jaundice, weakness and anorexia

[ ] 3. Don’t know

22. What is the causative agent of bird flu?

[ ] 1. Virus [ ] 2. Bacteria [ ] 3. Parasite [ ] 4. Don’t know

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23. What are the modes of transmission of bird flu?

	Yes	No	Don't know
23.1 By direct contact of avian or infected animal?	[ ] 1.	[ ] 2.	[ ] 3.
23.2 People who eat uncooked meat of dead chicken and contact dead chicken.	[ ] 1.	[ ] 2.	[ ] 3.
23.3 By indirect contact of secretion of infected animal such as feces, mucus, tear, and saliva?	[ ] 1.	[ ] 2.	[ ] 3.

24. Can the bird flu be transmitted by persons to persons?

[ ] 1. Yes [ ] 2. No [ ] 3. Don't know

25. Can the bird flu be transmitted?

[ ] 1. Yes [ ] 2. No [ ] 3. Don't know

26. Is the bird flu a communicable disease?

[ ] 1. Yes [ ] 2. No [ ] 3. Don't know

27. Do you know that the highest risk of bird flu was direct contact of infected or dead animal as well as eating dead chicken meat?

[ ] 1. Yes [ ] 2. No [ ] 3. Don't know

28. Can the bird flu be treated?

[ ] 1. Yes [ ] 2. No [ ] 3. Don't know

29. Do you know that the bird flu can cause of illness and dead?

[ ] 1. Yes [ ] 2. No [ ] 3. Don't know

30. Do you know that one of prevention methods for bird flu infection is not to contact with sick or dead chicken?

[ ] 1. Yes [ ] 2. No [ ] 3. Don't know

31. Do you wear safeguard yourself when contacting sick or dead chicken?

[ ] 1. Yes [ ] 2. No [ ] 3. Don't know

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32. Do you wear safeguard yourself when contacting with carcass or bringing carcass to dispose?

    [ ] 1. Yes [ ] 2. No [ ] 3. Don't know

33. Do you know that people who have highest susceptibility to infect bird flu in the contaminated area are children and elderly?

    [ ] 1. Yes [ ] 2. No [ ] 3. Don't know

34. Do you know that the highest risk is direct contact of infected or dead animal as well as eating dead chicken meat?

    [ ] 1. Yes [ ] 2. No [ ] 3. Don't know

35. Do you know that vaccination for poultry such as chicken, duck and fighting rooster affect to mutation of bird flu virus (H5N1)?

    [ ] 1. Yes [ ] 2. No [ ] 3. Don't know

36. Do you know that people who contact avian such as slaughter, farmer, transportation worker, seller, and carcass carrier, and children playing with avian are risk of bird flu?

    [ ] 1. Yes [ ] 2. No [ ] 3. Don't know

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Attitudes about Avian Influenza

Attitudes	Agree	Not sure	Disagree
37. You are a concern to the avian flu.			
38. Avian flu is a preventable disease.			
39. Eating sick or dead chicken meat is risk to avian flu.			
40. People who eat uncooked dead chicken meat or contact with dead chicken can get avian flu.			
41. People who contacting poultry, killing, selling, transfer, disposing carcass, children playing with poultry, are more likely to get avian flu infect than people who never contacting poultry.			
42. People who get common cold with high fever, shill, sore throat, cough, and fatigue may be infected by avian flu.			
43. Hand washing with soap after contact with poultry could prevent avian flu.			
44. Consumption of fully cooked chickens meat and eggs can protect the infection of avian influenza.			
45. Children and elderly or immune suppressing are susceptible to infection easier than the normal person.			
46. People who fed fighting roosters and had close association especially with contaminated areas are population at risk to be infected from avian flu.			
47. Wearing mask, gloves, goggle and boot while work in poultry farm or keeping animal carcass to dispose can protect infection of avian flu.			
48. Housewives and chefs play an important role in the prevention of avian flu. They must fully cook, and always sanitize.			
49. At present, are you at risk to avian flu?			
50. At present, are your family members at risk to avian flu?			

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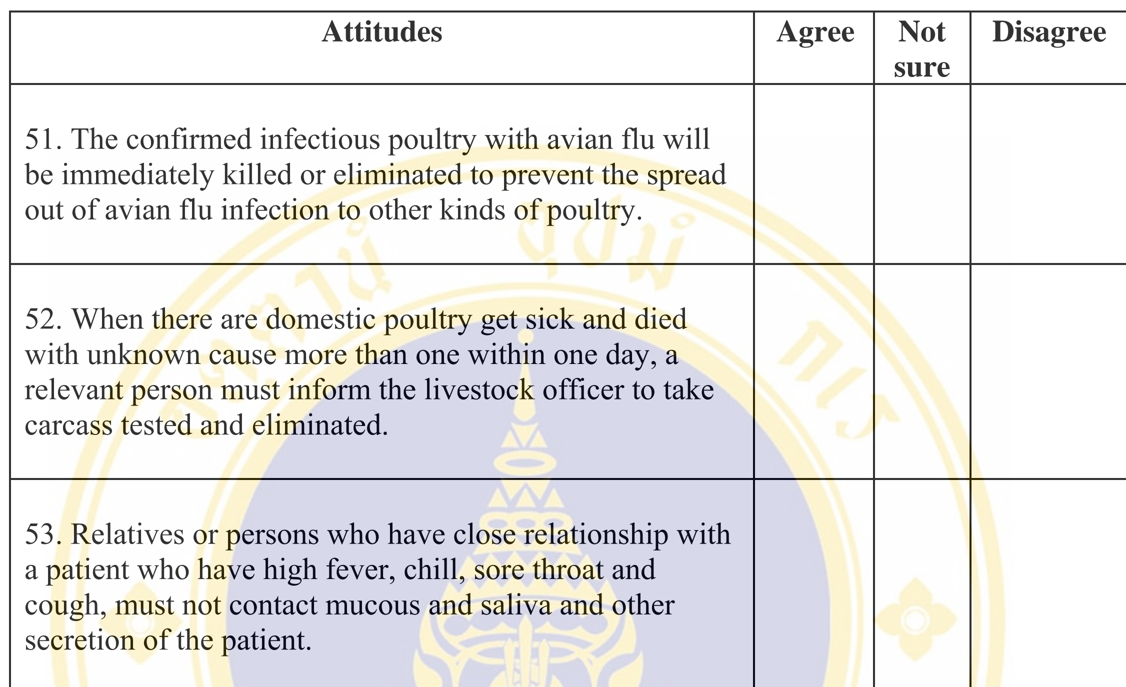
Attitudes about Avian Influenza (Continuous)

Attitudes	Agree	Not sure	Disagree
51. The confirmed infectious poultry with avian flu will be immediately killed or eliminated to prevent the spread out of avian flu infection to other kinds of poultry.			
52. When there are domestic poultry get sick and died with unknown cause more than one within one day, a relevant person must inform the livestock officer to take carcass tested and eliminated.			
53. Relatives or persons who have close relationship with a patient who have high fever, chill, sore throat and cough, must not contact mucous and saliva and other secretion of the patient.			



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Practices about Avian Influenza

Practices	All time	Some-times	No practice
54. Do you purchase only chicken and chicken products from a guaranteed or standardized shop?			
55. Do you immediately go to the physician or health worker when you get common cold with high fever, chill, sore throat, and cough, especially during the outbreak in poultry population?			
56. Do you immediately take your family members who get common with high fever, chill, sore throat, and cough to the physician or health worker, especially during the outbreak in poultry population?			
57. Do you advise your family members when they get common cold to prevent spread of disease to other persons?			
58. Do you purchase sick chicken with cyanosis, ruffled feathers, snivel, diarrhea etc., or dead chicken slaughtered for sale?			
59. Do you always protect yourself properly before contacting sick poultry or dead by wearing the personal protection equipment (gloves, glasses, a mask, an apron, a pair of boots)?			
60. Do you take a bath or a shower, and change new cloths, after work?			
61. Do you always disinfect or clean the personal protection equipment (e.g. the dirty clothes, apron, mask, gloves, glasses, and have them dried in the sunlight) before re-using?			
62. At present, do you eat soft-boiled or uncooked eggs?			
63. Do you continuously clean cages with detergent and water at least once a week?			
64. Do you keep a close watch on children by warning them not to handle any chickens or birds and not to carry any carcasses?			
65. Do you always eat fully cooked chicken meat and eggs (for protection the infection of avian flu)?			
66. Do you always fully cook food before eating (to protect the infection of avian flu)?			
67. Can you properly practice yourself following the regulations of avian flu prevention by washing hand with soap before eating food, eating fully cooked food, not direct contact with sick and dead chicken?			
68. Can your family members properly practice themselves following the regulations of avian flu prevention?			

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Practice Behavior on hand washing

69. Hand watching behavior involves 11 items. Please mark √ in the item that you have performed. If you mark √ "No" in the application then you can skip to the next item. If you mark √ "Yes" in the application. You need to answer the frequency of hand washing and method of washing.

Statements	Application		Frequency of washing hand			Means of washing	
	No (0)	Yes (1)	No (0)	Sometimes (1)	All times (2)	Water (1)	Soap (2)
1.Before preparing foods							
2. After preparing foods							
3. Before eating foods							
4. After using toilet							
5. After killing and cutting poultry meat.							
6. After handling poultry							
7. After cleaning coop/cage of poultry							
8. After feeding or watering poultry							
9. Protection from coughing or sneezing (use hand/handkerchief/tissue)							
10. After touching garbage and taking garbage to dispose							
11. After touching carcass							

Attention

- Any item answer "No" in the blank of application, don't ask frequency and method of washing hand.
- If the item 15 is answer "No" (don't raise animal), the statement 7,8 have to answer "No" in the blank of application.

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Interviewing Questionnaire Series II for the experimental village
For pretest household representatives group, the key communities and also use posttest in the key communities group
Interviewing Questionnaire for Avian Influenza
Prevention and Control Program

Instruction: Please mark √ in the provided box [ ] or fill in the blank if applicable

1. ID number of the respondent □□□□□

2. Date of Interview...

3. Name of respondent.......................................

4. Present Local Address: Household No ....Village No. ......
   Tambon ...., District ....Suphan Buri Province.

5. Name of Interviewer...

Part I Demographic Characteristics

1. Sex [ ] 1. Male [ ] 2. Female
2. Age................years
3. What is your highest education level?
   - [ ] 1. Never attended school
   - [ ] 2. Primary grades 1 - 4
   - [ ] 3. Elementary grades 5 - 6
   - [ ] 4. Junior High school
   - [ ] 5. High school/equivalence
   - [ ] 6. Certificate
   - [ ] 7. Bachelor degree/higher
   - [ ] 8. Others (specify)..

4. What is your marital status?

   [ ] 1. Single [ ] 2. Married [ ] 3. Widow
   [ ] 4. Divorced [ ] 5. Separated [ ] 6. others (specify)......

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5. What is your religion?

[ ] 1. Buddhist [ ] 2. Christian

[ ] 3. Muslim [ ] 4. Others (specify)……………………..

6. What is your primary job?

[ ] 1. Unemployment [ ] 2. Government officer

[ ] 3. Employee [ ] 4. Agriculturalist

[ ] 5. Student [ ] 6. Housewife

[ ] 7. Trade [ ] 8. Others (specify)……

7. What is your monthly household income?

[ ] 1. < 5,000 [ ] 2. 5,000-10,000

[ ] 3. 10,001-15,000 [ ] 4. 15,001-20,000

[ ] 5. 20,001-25,000 [ ] 6. 25,001- 30,000

[ ] 7. > 30,000

8. Do you have children or elderly in your family?

[ ] 1. No (skip to item 9) [ ] 2. Yes

If yes, how many children and elderly are there in your family have?

Children: 0 - 5 years old………person

6 - 10 years old…….. person

11 - 15 years old……..person

Elderly: =>60 years old ………person

9. Where do you usually go to receive health care service for yourself?

[ ] 1. Pharmacy [ ] 2. Public Health Center

[ ] 3. Private medical physician [ ] 4. Public Hospital

[ ] 5. Private Hospital

[ ] 6. Other (specify)…………………

10. How long does it take from your house to the above health care service?

[ ] 1. < 10 minutes [ ] 2. 10-30 minutes

[ ] 3. >30-60 minutes [ ] 4. > 60 minutes

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11. What kind of transportation do you generally use to go to the health care service?

[ ] 1. Walking [ ] 2. Bicycle [ ] 3. Public car

[ ] 4. Private car [ ] 5. Motorboat [ ] 6. Motorcycle

[ ] 7. Others (specify)…………………………………….

12. Do you live in your own house?

[ ] 1. No [ ] 2. Yes

13. What is your status in the family?

[ ] 1. head of the household [ ] 2. wife [ ] 3. son/daughter

[ ] 4. son/daughter-in-law [ ] 5. parent [ ] 6. others (specify)….

14 Have you received information about the avian influenza?

[ ] 1. No (skip to item 9) [ ] 2. Yes

If yes, from which sources of information do you get about the avian influenza? (more than 1 answer).

[ ] 1. T.V. [ ] 2. radio [ ] 3. magazine [ ] 4. newspaper

[ ] 5. parents [ ] 6. lover [ ] 7. drug store [ ] 8. friend

[ ] 9. son/daughter [ ] 10. kindred

[ ] 11. health care worker (physician, nurse, etc.)

[ ] 12. Village Health Volunteer (VHV)

[ ] 13. others (specify)…………………………………………………….

15. Do you raise animals?

[ ] 1. No (answer item 16) [ ] 2. Yes (If "Yes" skip to item 17)

16. Do you work in an animal farm?

[ ] 1 No

[ ] 2. Yes (Specify function)……………………..

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17. What type of the animals, number of the animal, and means of raising and contacting with the animal do you have? (more than 1 answer)

Type of animal	**Number**	**Means of raising the animal**	**Frequency of contacting (yourself)**	**Other people in family exposed**
Native chicken	………	□1. Nature raising □2. Open farm □3. Closed farm □4 Coop/Cage □5 Others (specify)………..	□1. Everyday □2. Sometimes □3. Seldom □4. No contact	□1 Oneself □2. Spouse □3. Children □4. Mother/Father □5. Others (specify)………
Fighting cock	………	□1. Nature raise □2. Open farm □3. Closed farm □4 Coop/Cage □5 Others (specify)………..	□1. Everyday □2. Sometimes □3. Seldom □4. No contact	□1 Oneself □2. Spouse □3. Children □4. Mother/Father □5. Others (specify)………
Breed chicken meat	**……….**	□1. Nature raise □2. Open farm □3. Closed farm □4 Coop/Cage □5 Others (specify)………..	□1. Everyday □2. Sometimes □3. Seldom □4. No contact	□1 Oneself □2. Spouse □3. Children □4. Mother/Father □5. Others (specify)………
Breed chicken egg	………	□1. Nature raise □2. Open farm □3. Closed farm □4 Coop/Cage □5 Others (specify)………..	□1. Everyday □2. Sometimes □3. Seldom □4. No contact	□1 Oneself □2. Spouse □3. Children □4. Mother/Father □5. Others (specify)………
Duck	………	□1. Nature raise □2. Open farm □3. Closed farm □4 Coop/Cage □5 Others (specify)…………	□1. Everyday □2. Sometimes □3. Seldom □4. No contact	□1 Oneself □2. Spouse □3. Children □4. Mother/Father □5. Others (specify)………

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17. (Continuous)

Type of animal	Number	Means of feeding the animal	Frequency of contacting (yourself)	Other people in family exposed
Geese		□1. Nature raise □2. Open farm □3. Closed farm □4 Coop/Cage □5 Others (specify)………	□1. Everyday □2. Sometimes □3. Seldom □4. No contact	□1 Oneself □2. Spouse □3. Children □4. Mother/Father □5. Others (specify)…
Quails		□1. Nature raise □2. Open farm □3. Closed farm □4 Coop/Cage □5 Others (specify)………	□1. Everyday □2. Sometimes □3. Seldom □4. No contact	□1 Oneself □2. Spouse □3. Children □4. Mother/Father □5. Others (specify)…
Others………		□1. Nature raise □2. Open farm □3. Closed farm □4 Coop/Cage □5 Others (specify)………	□1. Everyday □2. Sometimes □3. Seldom □4. No contact	□1 Oneself □2. Spouse □3. Children □4. Mother/Father □5. Others (specify)…

18. How did you dispose the garbage/refuse from your house?

[ ] 1. Put on ground

[ ] 2. Collected as a heap

[ ] 3. Collected and buried

[ ] 4. Collected and burnt

[ ] 5. Threw in the canal

[ ] 6. Collected and refer to TAO/municipality

[ ] 7. Others (specify) …………………………

19. Have your family members slaughtered poultry for consuming in your family?

[ ] 1. No (skip to item 20) [ ] 2. Yes

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19.1 Who has slaughtered or cut the poultry mostly?

[ ] 1. Myself [ ] 2. Parents [ ] 3. Brother/sisters

[ ] 4. Son/daughter [ ] 5. Others (specify)………..

19.2 Where were the poultry slaughtered or cut mostly?

[ ] 1. basement [ ] 2. Kitchen

[ ] 3. Front yard [ ] 4. Others (specify)……….

19.3 By what methods were the poultry slaughtered mostly?

[ ] 1. Hit head [ ] 2. Cut neck [ ] 3. Others (specify)……

19.4 By what methods was used to eliminate carcass or animals leftover?

[ ] 1. Burying [ ] 2. Burning [ ] 3. Feeding animals

[ ] 4. Throwing in the yard of house [ ] 5. Others (specify)…….

19.5 Do you always wear safeguard while slaughtering or cutting poultry?

[ ]1. No

[ ] 2. Yes (specify)………

20. Where do you frequently purchase poultry or poultry meat to cook in your family?

[ ] 1. Shop in the village [ ] 2. Fresh – food market of municipality

[ ] 3. Fresh – food market of TAO. [ ] 4. Department store

[ ] 5. Others (specify)…………………..

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Part II Psychosocial Factors

Knowledge about Avian Influenza

21. What are the major signs and symptoms of avian influenza?

[ ] 1. High fever, chill, headache, myalgia, prostration, sore throat, and cough

[ ] 2. Jaundice, weakness, and anorexia

[ ] 3. Don't know

22. What is the causative agent of avian influenza ?

[ ] 1. Virus [ ] 2. Bacteria [ ] 3. Parasite [ ] 4. Don't know

23. What are the modes of transmission of avian influenza?

	Yes	No	Don't know
23.1 By direct contact of the poultry or infected animal?	[ ] 1.	[ ] 2.	[ ] 3.
23.2 People who eat uncooked meat of dead chicken and contact dead chicken.	[ ] 1.	[ ] 2.	[ ] 3.
23.3 By indirect contact of secretion of infected animal such as feces, mucus, tear, and saliva?	[ ] 1.	[ ] 2.	[ ] 3.

24. Can avian influenza be transmitted from persons to persons?

[ ] 1. Yes [ ] 2. No [ ] 3. Don't know

25. Can avian influenza be transmitted?

[ ] 1. Yes [ ] 2. No [ ] 3. Don't know

26. Is avian influenza a communicable disease?

[ ] 1. Yes [ ] 2. No [ ] 3. Don't know

27. Do you know that the highest risk of avian influenza was the direct contact of infected or dead animal as well as eating dead chicken meat?

[ ] 1. Yes [ ] 2. No [ ] 3. Don't know

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28. Can avian influenza be treated?

[ ] 1. Yes [ ] 2. No [ ] 3. Don't know

29. Do you know that avian influenza can cause illness and dead?

[ ] 1. Yes [ ] 2. No [ ] 3. Don't know

30. Do you know that one of prevention methods for avian influenza infection is "Don't contact with sick or dead chicken"?

[ ] 1. Yes [ ] 2. No [ ] 3. Don't know

31. Do you wear safeguard yourself when contacting the sick or dead chicken?

[ ] 1. Yes [ ] 2. No [ ] 3. Don't know

32. Do you wear safeguard yourself when contacting with carcass or bringing carcass to dispose?

[ ] 1. Yes [ ] 2. No [ ] 3. Don't know

33. Do you know that people who have highest susceptibility to infect avian influenza in the contaminated area are children and elderly?

[ ] 1. Yes [ ] 2. No [ ] 3. Don't know

34. Do you know that the highest risk is the direct contact of infected or dead animal as well as eating dead chicken meat?

[ ] 1. Yes [ ] 2. No [ ] 3. Don't know

35. Do you know that vaccination for poultry such as chicken, duck and fighting rooster affect to mutation of bird flu virus (H5N1)?

[ ] 1. Yes [ ] 2. No [ ] 3. Don't know

36. Do you know that people who contact the poultry such as slaughterer, farmer, transportation worker, seller, and carcass carrier, and children playing with the poultry are risk of avian influenza?

[ ] 1. Yes [ ] 2. No [ ] 3. Don't know

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Attitudes about Avian Influenza

Attitudes	Agree	Not sure	Disagree
37. You are a concern to the avian flu.			
38. Avian flu is a preventable disease.			
39. Eating sick or dead chicken meat is risk to avian flu.			
40. People who eat uncooked dead chicken meat or contact with dead chicken can get avian flu.			
41. People who contacting poultry, killing, selling, transfer, disposing carcass, children playing with poultry, are more likely to get avian flu infect than people who never contacting poultry.			
42. People who get common cold with high fever, shill, sore throat, cough, and fatigue may be infected by avian flu.			
43. Hand washing with soap after contact with poultry could prevent avian flu.			
44. Consumption of fully cooked chickens meat and eggs can protect the infection of avian influenza.			
45. Children and elderly or immune suppressing are susceptible to infection easier than the normal person.			
46. People who fed fighting roosters and had close association especially with contaminated areas are population at risk to be infected from avian flu.			
47. Wearing mask, gloves, goggle and boot while work in poultry farm or keeping animal carcass to dispose can protect infection of avian flu.			
48. Housewives and chefs play an important role in the prevention of avian flu. They must fully cook, and always sanitize.			
49. At present, are you at risk to avian flu?			
50. At present, are your family members at risk to avian flu?			

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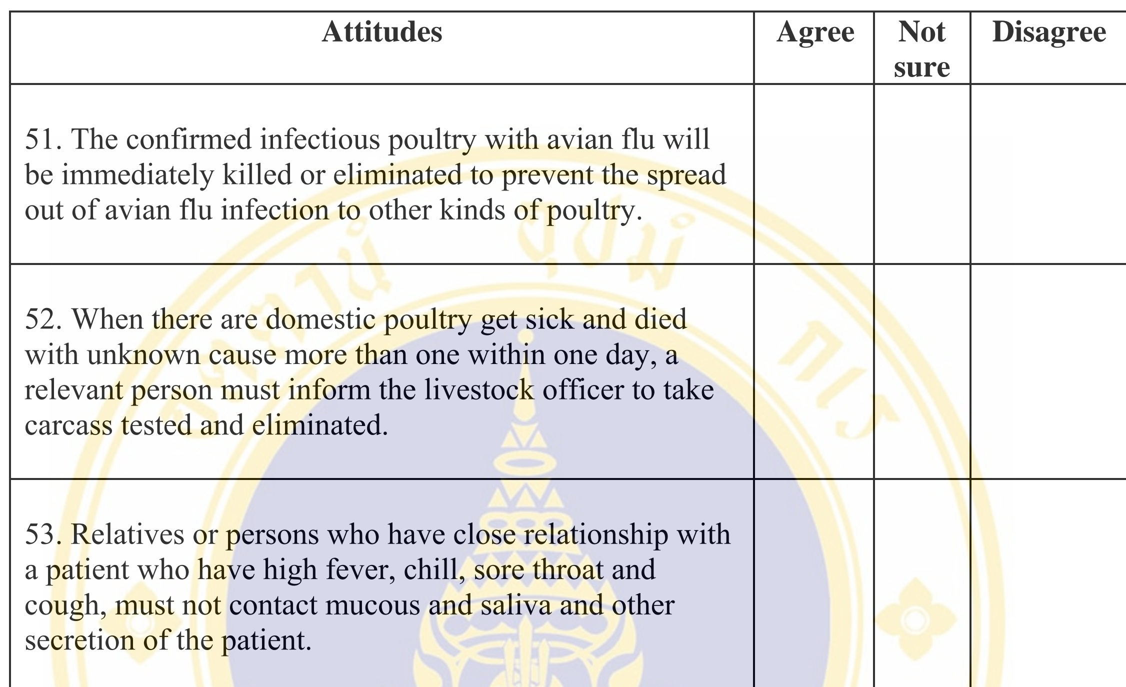
Attitudes about Avian Influenza (Continuous)

Attitudes	Agree	Not sure	Disagree
51. The confirmed infectious poultry with avian flu will be immediately killed or eliminated to prevent the spread out of avian flu infection to other kinds of poultry.			
52. When there are domestic poultry get sick and died with unknown cause more than one within one day, a relevant person must inform the livestock officer to take carcass tested and eliminated.			
53. Relatives or persons who have close relationship with a patient who have high fever, chill, sore throat and cough, must not contact mucous and saliva and other secretion of the patient.			



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Practices about Avian Influenza Prevention

Practices	All time	Some-times	No practice
54. Do you purchase only chicken and chicken products from a guaranteed or standardized shop?			
55. Do you immediately go to the physician or health worker when you get common cold with high fever, chill, sore throat, and cough, especially during the outbreak in poultry population?			
56. Do you immediately take your family members who get common with high fever, chill, sore throat, and cough to the physician or health worker, especially during the outbreak in poultry population?			
57. Do you advise your family members when they get common cold to prevent spread of disease to other persons?			
58. Do you purchase sick chicken with cyanosis, ruffled feathers, snivel, diarrhea etc., or dead chicken slaughtered for sale?			
59. Do you always protect yourself properly before contacting sick poultry or dead by wearing the personal protection equipment (gloves, glasses, a mask, an apron, a pair of boots)?			
60. Do you take a bath or a shower, and change new cloths, after work?			
61. Do you always disinfect or clean the personal protection equipment (e.g. the dirty clothes, apron, mask, gloves, glasses, and have them dried in the sunlight) before re-using?			
62. At present, do you eat soft-boiled or uncooked eggs?			
63. Do you continuously clean cages with detergent and water at least once a week?			
64. Do you keep a close watch on children by warning them not to handle any chickens or birds and not to carry any carcasses?			
65. Do you always eat fully cooked chicken meat and eggs (for protection the infection of avian flu)?			
66. Do you always fully cook food before eating (to protect the infection of avian flu)?			
67. Can you properly practice yourself following the regulations of avian flu prevention by washing hand with soap before eating food, eating fully cooked food, not direct contact with sick and dead chicken?			
68. Can your family members properly practice themselves following the regulations of avian flu prevention?			

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Practice Behavior on hand washing

69. Hand watching behavior involves 11 items. Please mark √ in the item that you have performed. If you mark √ "No" in the application then you can skip to the next item. If you mark √ "Yes" in the application, you need to answer the frequency of hand washing and method of washing.

Statements	Application		Frequency of washing hand			Means of washing	
	No (0)	Yes (1)	No (0)	Sometimes (1)	All times (2)	Water (1)	Soap (2)
1.Before preparing foods							
2. After preparing foods							
3. Before eating foods							
4. After using toilet							
5. After killing and cutting poultry meat.							
6. After handling poultry							
7. After cleaning coop/cage of poultry							
8. After feeding or watering poultry							
9. Protection from coughing or sneezing (use hand/handkerchief/tissue)							
10. After touching garbage and taking garbage to dispose							
11. After touching carcass							

Attention

- Any item is answered "No", in the blank of the application, frequency and method of hand washing must not be asked.
- If the item 15 is answered "No", (don't raise animal), the statement 7 and 8 have to be answered "No" in the blank of the application.

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Part III Perceived self - efficacy on behavioral practices for avian influenza prevention and control

Please mark √ in the provided space of each item according to the respondent's perception (Ask the respondent whether he/she be able to perform the following behavioral practices).

Statements	Self-efficacy			Necessary		
	Yes	Not sure	No	Very	Mid	less
70. Washing hand with soap all the times after contacting domestic animals.						
71. Always clean coop/cage by disinfectant to reduce the distribution of avian influenza.						
72. Wearing safeguard equipment before taking animal carcass to eliminate.						
73. Report the village health volunteers or a health care facility at once, if there is any person who has suspected signs of avian influenza occur (e.g. fever, headache, chill, sore throat, cough, etc.)						
74. Be good health results in good immunity against diseases.						
75. Advise or take children suspected of infection with respiratory disease to a health care facility as soon as possible.						
76. Advise personal sanitation to the poultry farmers (e.g. hand washing with soap)						
77. Report a livestock official at once, if there is any unusually sick animal or dead.						
78. Thoroughly clean the body with soap and water, and change new cloths after work related to animal, livestock or animal carcass disposal.						

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Part III Perceived self - efficacy on behavioral practices avian influenza prevention and control (Cont.)

Statements	Self-efficacy			Necessary		
	Yes	Not sure	No	Very	Mid	Less
79. Eliminate the illness or dead animal by burying or burning, if the event occurs.						
80. Advise neighbors regarding behavior prevention and control of avian influenza.						
81. Be able to participate in the meeting of Community Avian Influenza Committee.						
82. Give ideas for avian influenza prevention/control to the community leader.						
83. Help the campaign to survey and destroy illness animal or carcass and other activities about avian influenza to prevent and control the disease in the community.						
84. Do not move any avian species and their products from the infected area (within 60-kilometer radius from infected farms) in order to prevent and control distribution of the avian influenza.						
85. Do not bring dead chicken or dead duck and their products to sale or raise animal in order to prevent and control distribution of avian influenza.						
86. Advise neighbors to improve environmental sanitation in/around house, cage or farm.						

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Part III Perceived self - efficacy on behavioral practices avian influenza prevention and control (cont.)

Statements	Self-efficacy			Necessary		
	Yes	Not sure	No	Very	Mid	Less
Perception of ability of community 87. Most of people in your village have good cooperation with government by practicing themselves following the officer's advice to prevent and control the avian flu.						
88. People themselves in your village can operate prevention and control of the spread of avian influenza with official provider supported.						
89. When anyone gets common cold with high fever, chill, sore throat, and cough or with suspected sign of avian influenza, patient's relative have to inform the village health volunteer or health worker at nearby health center immediately.						
90. When there are sick or dead poultry with unknown cause occur (sick and dead more than one within one day) the animal owner or village health volunteer have to inform livestock officer or village headman/TAO immediately.						

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Interviewing Questionnaire Series II for the implementation village
For posttest in household representatives group
Interviewing Questionnaire for Avian Influenza
Prevention and Control Program

Instruction: Please mark √ in the provided box [ ] or fill in the blank if applicable

1. ID number of the respondent □□□□□

2. Date of Interview...

3. Name of respondent..

4. Present Local Address: Household No ....Village No. ......
   Tambon ...., District ....Suphan Buri Province.

5. Name of Interviewer...

Part I Demographic Characteristics

1. Sex [ ] 1. Male [ ] 2. Female
2. Age................years
3. What is your highest education level?
   - [ ] 1. Never attended school
   - [ ] 2. Primary grades 1 - 4
   - [ ] 3. Elementary grades 5 - 6
   - [ ] 4. Junior High school
   - [ ] 5. High school/equivalence
   - [ ] 6. Certificate
   - [ ] 7. Bachelor degree/higher
   - [ ] 8. Others (specify)..

4. What is your marital status?
   [ ] 1. Single [ ] 2. Married [ ] 3. Widow
   [ ] 4. Divorced [ ] 5. Separated [ ] 6. others (specify)......

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5. What is your religion?

[ ] 1. Buddhist [ ] 2. Christian

[ ] 3. Muslim [ ] 4. Others (specify)……………………..

6. What is your primary job?

[ ] 1. Unemployment [ ] 2. Government officer

[ ] 3. Employee [ ] 4. Agriculturalist

[ ] 5. Student [ ] 6. Housewife

[ ] 7. Trade [ ] 8. Others (specify)……

7. What is your monthly household income?

[ ] 1. < 5,000 [ ] 2. 5,000-10,000

[ ] 3. 10,001-15,000 [ ] 4. 15,001-20,000

[ ] 5. 20,001-25,000 [ ] 6. 25,001- 30,000

[ ] 7. > 30,000

8. Do you have children or elderly in your family?

[ ] 1. No (skip to item 9) [ ] 2. Yes

If yes, how many children and elderly are there in your family have?

Children: 0 - 5 years old………person

6 - 10 years old…….. person

11 - 15 years old……..person

Elderly: =>60 years old ………person

9. Where do you usually go to receive health care service for yourself?

[ ] 1. Pharmacy [ ] 2. Public Health Center

[ ] 3. Private medical physician [ ] 4. Public Hospital

[ ] 5. Private Hospital

[ ] 6. Other (specify)…………………

10. How long does it take from your house to the above health care service?

[ ] 1. < 10 minutes [ ] 2. 10-30 minutes

[ ] 3. >30-60 minutes [ ] 4. > 60 minutes

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11. What kind of transportation do you generally use to go to the health care service?

[ ] 1. Walking [ ] 2. Bicycle [ ] 3. Public car
[ ] 4. Private car [ ] 5. Motorboat [ ] 6. Motorcycle
[ ] 7. Others (specify)…………………………………….

12. Do you live in your own house?

[ ] 1. No [ ] 2. Yes

13. What is your status in the family?

[ ] 1. head of the household [ ] 2. wife [ ] 3. son/daughter
[ ] 4. son/daughter-in-law [ ] 5. parent [ ] 6. others (specify)….

14 Have you received information about the avian influenza?

[ ] 1. No (skip to item 9) [ ] 2. Yes

If yes, from which sources of information do you get about the avian influenza? (more than 1 answer).

[ ] 1. T.V. [ ] 2. radio [ ] 3. magazine [ ] 4. newspaper
[ ] 5. parents [ ] 6. lover [ ] 7. drug store [ ] 8. friend
[ ] 9. son/daughter [ ] 10. kindred
[ ] 11. health care worker (physician, nurse, etc.)
[ ] 12. Village Health Volunteer (VHV)
[ ] 13. others (specify)…………………………………………………

15. Do you raise animals?

[ ] 1. No (answer item 16)
[ ] 2. Yes (If "Yes" skip to item 17)

16. Do you work in an animal farm?

[ ] 1 No
[ ] 2. Yes (Specify function)……………………..

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17. What type of the animals, number of the animal, and means of raising and contacting with the animal do you have? (more than 1 answer)

Type of animal	Number	Means of raising the animal	Frequency of contacting (yourself)	Other people in family exposed
Domestic chicken	………	□1. Nature raising □2. Open farm □3. Closed farm □4 Coop/Cage □5 Others (specify)………..	□1. Everyday □2. Sometimes □3. Seldom □4. No contact	□1 Oneself □2. Spouse □3. Children □4. Mother/Father □5. Others (specify)………
Fighting cock	………	□1. Nature raise □2. Open farm □3. Closed farm □4 Coop/Cage □5 Others (specify)………..	□1. Everyday □2. Sometimes □3. Seldom □4. No contact	□1 Oneself □2. Spouse □3. Children □4. Mother/Father □5. Others (specify)………
Breed chicken meat	**………**	□1. Nature raise □2. Open farm □3. Closed farm □4 Coop/Cage □5 Others (specify)………..	□1. Everyday □2. Sometimes □3. Seldom □4. No contact	□1 Oneself □2. Spouse □3. Children □4. Mother/Father □5. Others (specify)………
Breed chicken egg	………	□1. Nature raise □2. Open farm □3. Closed farm □4 Coop/Cage □5 Others (specify)………..	□1. Everyday □2. Sometimes □3. Seldom □4. No contact	□1 Oneself □2. Spouse □3. Children □4. Mother/Father □5. Others (specify)………
Duck	………	□1. Nature raise □2. Open farm □3. Closed farm □4 Coop/Cage □5 Others (specify)…………	□1. Everyday □2. Sometimes □3. Seldom □4. No contact	□1 Oneself □2. Spouse □3. Children □4. Mother/Father □5. Others (specify)………

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17. (Continuous)

Type of animal	Number	Means of feeding the animal	Frequency of contacting (yourself)	Other people in family exposed
Geese		□1. Nature raise □2. Open farm □3. Closed farm □4 Coop/Cage □5 Others (specify)………	□1. Everyday □2. Sometimes □3. Seldom □4. No contact	□1 Oneself □2. Spouse □3. Children □4. Mother/Father □5. Others (specify)………
Quails		□1. Nature raise □2. Open farm □3. Closed farm □4 Coop/Cage □5 Others (specify)………	□1. Everyday □2. Sometimes □3. Seldom □4. No contact	□1 Oneself □2. Spouse □3. Children □4. Mother/Father □5. Others (specify)………
Others………		□1. Nature raise □2. Open farm □3. Closed farm □4 Coop/Cage □5 Others (specify)………	□1. Everyday □2. Sometimes □3. Seldom □4. No contact	□1 Oneself □2. Spouse □3. Children □4. Mother/Father □5. Others (specify)………

18. How did you dispose the garbage/refuse from your house?

[ ] 1. Put on ground

[ ] 2. Collected as a heap

[ ] 3. Collected and buried

[ ] 4. Collected and burnt

[ ] 5. Threw in the canal

[ ] 6. Collected and refer to TAO/municipality

[ ] 7. Others (specify) …………………………

19. Have your family members slaughtered poultry for consuming in your family?

[ ] 1. No (skip to item 20) [ ] 2. Yes

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19.1 Who has slaughtered or cut the poultry mostly?

[ ] 1. Myself [ ] 2. Parents [ ] 3. Brother/sisters

[ ] 4. Son/daughter [ ] 5. Others (specify)………..

19.2 Where were the poultry slaughtered or cut mostly?

[ ] 1. basement [ ] 2. Kitchen

[ ] 3. Front yard [ ] 4. Others (specify)……….

19.3 By what methods were the poultry slaughtered mostly?

[ ] 1. Hit head [ ] 2. Cut neck [ ] 3. Others (specify)……

19.4 By what methods was used to eliminate carcass or animals leftover?

[ ] 1. Burying [ ] 2. Burning [ ] 3. Feeding animals

[ ] 4. Throwing in the yard of house [ ] 5. Others (specify)…….

19.5 Do you always wear safeguard while slaughtering or cutting poultry?

[ ]1. No

[ ] 2. Yes (specify)………

20. Where do you frequently purchase poultry or poultry meat to cook in your family?

[ ] 1. Shop in the village [ ] 2. Fresh – food market of municipality

[ ] 3. Fresh – food market of TAO. [ ] 4. Department store

[ ] 5. Others (specify)…………………..

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Part II Psychosocial Factors

Knowledge about Avian Influenza

21. What are the major signs and symptoms of avian influenza?

[ ] 1. High fever, chill, headache, myalgia, prostration, sore throat, and cough

[ ] 2. Jaundice, weakness, and anorexia

[ ] 3. Don't know

22. What is the causative agent of avian influenza ?

[ ] 1. Virus [ ] 2. Bacteria [ ] 3. Parasite [ ] 4. Don't know

23. What are the modes of transmission of avian influenza?

	Yes	No	Don't know
23.1 By direct contact of the poultry or infected animal?	[ ] 1.	[ ] 2.	[ ] 3.
23.2 People who eat uncooked meat of dead chicken and contact dead chicken.	[ ] 1.	[ ] 2.	[ ] 3.
23.3 By indirect contact of secretion of infected animal such as feces, mucus, tear, and saliva?	[ ] 1.	[ ] 2.	[ ] 3.

24. Can avian influenza be transmitted from persons to persons?

[ ] 1. Yes [ ] 2. No [ ] 3. Don't know

25. Can avian influenza be transmitted?

[ ] 1. Yes [ ] 2. No [ ] 3. Don't know

26. Is avian influenza a communicable disease?

[ ] 1. Yes [ ] 2. No [ ] 3. Don't know

27. Do you know that the highest risk of avian influenza was the direct contact of infected or dead animal as well as eating dead chicken meat?

[ ] 1. Yes [ ] 2. No [ ] 3. Don't know

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28. Can avian influenza be treated?

[ ] 1. Yes [ ] 2. No [ ] 3. Don't know

29. Do you know that avian influenza can cause illness and dead?

[ ] 1. Yes [ ] 2. No [ ] 3. Don't know

30. Do you know that one of prevention methods for avian influenza infection is "Don't contact with sick or dead chicken"?

[ ] 1. Yes [ ] 2. No [ ] 3. Don't know

31. Do you wear safeguard yourself when contacting the sick or dead chicken?

[ ] 1. Yes [ ] 2. No [ ] 3. Don't know

32. Do you wear safeguard yourself when contacting with carcass or bringing carcass to dispose?

[ ] 1. Yes [ ] 2. No [ ] 3. Don't know

33. Do you know that people who have highest susceptibility to infect avian influenza in the contaminated area are children and elderly?

[ ] 1. Yes [ ] 2. No [ ] 3. Don't know

34. Do you know that the highest risk is the direct contact of infected or dead animal as well as eating dead chicken meat?

[ ] 1. Yes [ ] 2. No [ ] 3. Don't know

35. Do you know that vaccination for poultry such as chicken, duck and fighting rooster affect to mutation of bird flu virus (H5N1)?

[ ] 1. Yes [ ] 2. No [ ] 3. Don't know

36. Do you know that people who contact the poultry such as slaughterer, farmer, transportation worker, seller, and carcass carrier, and children playing with the poultry are risk of avian influenza?

[ ] 1. Yes [ ] 2. No [ ] 3. Don't know

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Attitudes about Avian Influenza

Attitudes	Agree	Not sure	Disagree
37. You are a concern to the avian flu.			
38. Avian flu is a preventable disease.			
39. Eating sick or dead chicken meat is risk to avian flu.			
40. People who eat uncooked dead chicken meat or contact with dead chicken can get avian flu.			
41. People who contacting poultry, killing, selling, transfer, disposing carcass, children playing with poultry, are more likely to get avian flu infect than people who never contacting poultry.			
42. People who get common cold with high fever, shill, sore throat, cough, and fatigue may be infected by avian flu.			
43. Hand washing with soap after contact with poultry could prevent avian flu.			
44. Consumption of fully cooked chickens meat and eggs can protect the infection of avian influenza.			
45. Children and elderly or immune suppressing are susceptible to infection easier than the normal person.			
46. People who fed fighting roosters and had close association especially with contaminated areas are population at risk to be infected from avian flu.			
47. Wearing mask, gloves, goggle and boot while work in poultry farm or keeping animal carcass to dispose can protect infection of avian flu.			
48. Housewives and chefs play an important role in the prevention of avian flu. They must fully cook, and always sanitize.			
49. At present, are you at risk to avian flu?			
50. At present, are your family members at risk to avian flu?			

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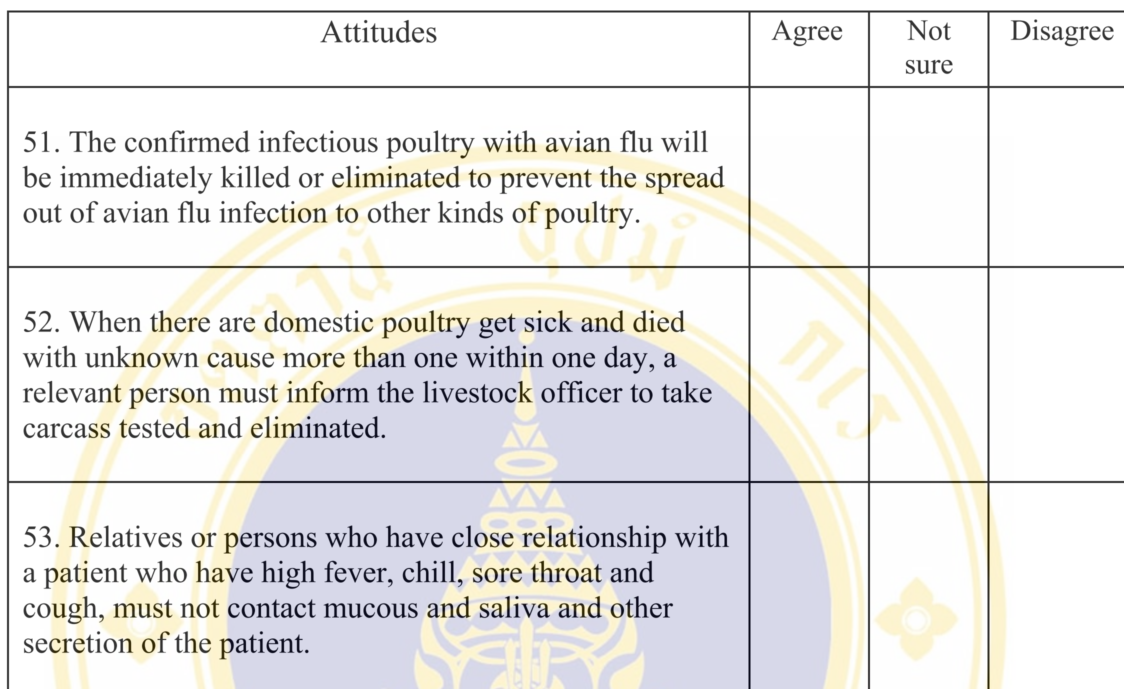
Attitudes about Avian Influenza (Continuous)



Attitudes	Agree	Not sure	Disagree
51. The confirmed infectious poultry with avian flu will be immediately killed or eliminated to prevent the spread out of avian flu infection to other kinds of poultry.			
52. When there are domestic poultry get sick and died with unknown cause more than one within one day, a relevant person must inform the livestock officer to take carcass tested and eliminated.			
53. Relatives or persons who have close relationship with a patient who have high fever, chill, sore throat and cough, must not contact mucous and saliva and other secretion of the patient.			

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Practices about Avian Influenza Prevention

Practices	All time	Some-times	No practice
54. Do you purchase only chicken and chicken products from a guaranteed or standardized shop?			
55. Do you immediately go to the physician or health worker when you get common cold with high fever, chill, sore throat, and cough, especially during the outbreak in poultry population?			
56. Do you immediately take your family members who get common with high fever, chill, sore throat, and cough to the physician or health worker, especially during the outbreak in poultry population?			
57. Do you advise your family members when they get common cold to prevent spread of disease to other persons?			
58. Do you purchase sick chicken with cyanosis, ruffled feathers, snivel, diarrhea etc., or dead chicken slaughtered for sale?			
59. Do you always protect yourself properly before contacting sick poultry or dead by wearing the personal protection equipment (gloves, glasses, a mask, an apron, a pair of boots)?			
60. Do you take a bath or a shower, and change new cloths, after work?			
61. Do you always disinfect or clean the personal protection equipment (e.g. the dirty clothes, apron, mask, gloves, glasses, and have them dried in the sunlight) before re-using?			
62. At present, do you eat soft-boiled or uncooked eggs?			
63. Do you continuously clean cages with detergent and water at least once a week?			
64. Do you keep a close watch on children by warning them not to handle any chickens or birds and not to carry any carcasses?			
65. Do you always eat fully cooked chicken meat and eggs (for protection the infection of avian flu)?			
66. Do you always fully cook food before eating (to protect the infection of avian flu)?			
67. Can you properly practice yourself following the regulations of avian flu prevention by washing hand with soap before eating food, eating fully cooked food, not direct contact with sick and dead chicken?			
68. Can your family members properly practice themselves following the regulations of avian flu prevention?			

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Practices Behavior on hand washing

69. Hand watching behavior involves 11 items. Please mark √ in the item that you have performed. If you mark √ "No" in the application then you can skip to the next item. If you mark √ "Yes" in the application, you need to answer the frequency of hand washing and method of washing.

Statements	Application		Frequency of washing hand			Means of washing	
	No (0)	Yes (1)	No (0)	Sometimes (1)	All times (2)	Water (1)	Soap (2)
1.Before preparing foods							
2. After preparing foods							
3. Before eating foods							
4. After using toilet							
5. After killing and cutting poultry meat.							
6. After handling poultry							
7. After cleaning coop/cage of poultry							
8. After feeding or watering poultry							
9. Protection from coughing or sneezing (use hand/handkerchief/tissue)							
10. After touching garbage and taking garbage to dispose							
11. After touching carcass							

Attention

- Any item is answered "No", in the blank of the application, frequency and method of hand washing must not be asked.
- If the item 15 is answered "No", (don't raise animal), the statement 7 and 8 have to be answered "No" in the blank of the application.

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Part III Perceived self - efficacy on behavioral practices for avian influenza prevention and control

Please mark √ in the provided space of each item according to the respondent's perception (Ask the respondent whether he/she be able to perform the following behavioral practices).

Statements	Self-efficacy			Necessary		
	Yes	Not sure	No	Very	Mid	Less
70. Washing hand with soap all the times after contacting domestic animals.						
71. Always clean coop/cage by disinfectant to reduce the distribution of avian influenza.						
72. Wearing safeguard equipment before taking animal carcass to eliminate.						
73. Report the village health volunteers or a health care facility at once, if there is any person who has suspected signs of avian influenza occur (e.g. fever, headache, chill, sore throat, cough, etc.)						
74. Be good health results in good immunity against diseases.						
75. Advise or take children suspected of infection with respiratory disease to a health care facility as soon as possible.						
76. Advise personal sanitation to the poultry farmers (e.g. hand washing with soap)						
77. Report a livestock official at once, if there is any unusually sick animal or dead.						
78. Thoroughly clean the body with soap and water, and change new cloths after work related to animal, livestock or animal carcass disposal.						

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Part III perceived self - efficacy on behavioral practices avian influenza prevention and control (Cont.)

Statements	Self-efficacy			Necessary		
	Yes	Not sure	No	Very	Mid	Less
79. Eliminate the illness or dead animal by burying or burning, if the event occurs.						
80. Advise neighbors regarding behavior prevention and control of avian influenza.						
81. Be able to participate in the meeting of Community Avian Influenza Committee.						
82. Give ideas for avian influenza prevention/control to the community leader.						
83. Help the campaign to survey and destroy illness animal or carcass and other activities about avian influenza to prevent and control the disease in the community.						
84. Do not move any avian species and their products from the infected area (within 60-kilometer radius from infected farms) in order to prevent and control distribution of the avian influenza.						
85. Do not bring dead chicken or dead duck and their products to sale or raise animal in order to prevent and control distribution of avian influenza.						
86. Advise neighbors to improve environmental sanitation in/around house, cage or farm.						

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Part III perceived self - efficacy on behavioral practices avian influenza prevention and control (cont.)

Statements	Self-efficacy			Necessary		
	Yes	Not sure	No	Very	Mid	Less
Perception of ability of community 87. Most of people in your village have good cooperation with government by practicing themselves following the officer's advice to prevent and control the avian flu.						
88. People themselves in your village can operate prevention and control of the spread of avian influenza with official provider supported.						
89. When anyone gets common cold with high fever, chill, sore throat, and cough or with suspected sign of avian influenza, patient's relative have to inform the village health volunteer or health worker at nearby health center immediately.						
90. When there are sick or dead poultry with unknown cause occur (sick and dead more than one within one day) the animal owner or village health volunteer have to inform livestock officer or village headman/TAO immediately.						

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Part 4 the assessment of people's satisfaction (received social support) and participation to prevent and control the avian influenza in the study village.

Please mark √ in the blank that you have chosen and/or put the explanation in the blank if possible.

Statements	Satisfaction levels			Not satisfy (0)
	Very (3)	Medium (2)	Little (1)	
91. You satisfied the researcher, Mr. Tavorn Maton, who has come to perform the research project in your village.				# Because........ ....
92. How much did you know or understand the objectives of the research project to prevent and control the avian influenza in your village?				# Because........... ....
93. You agreed or satisfied the research project to prevent and control the avian influenza in your village.				# Because........ ....
94. You agreed or satisfied the duration of the research project to prevent and control the avian influenza in your village during 6 months.				# Because............. ....
95. You satisfied the key community stakeholders that they realized the avian influenza problem in your village.				# Because........ ………………. ….
96. You satisfied the performance of the key community stakeholders to prevent and control the avian influenza in your village.				# Because........ ....
97. You satisfied the strict prohibition of the poultry moving in and out of your village.				# Because........ ....
98. You satisfied or agreed with the measurement of the avian influenza prevention in your village on the issues: 98.1 Clean house, cage/coop and improve the environment around house at least once a week (every Friday)				# Because........ ....
98.2 Don't take dead chicken with unknown cause to cook.				# Because........ ....

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Please mark √ in the blank that you have chosen and/or put the explanation in the

blank if possible (Cont.)

Questions	Satisfaction levels			Not satisfy (0)
	Very (3)	Medium (2)	Little (1)	
98.3 Protect the traveling birds to enter to live in the village.				# Because........ ....
98.4 Don't contact sick or dead chicken if not necessary. If so, wear the personal protective equipment such as gloves and mask to protect yourself.				# Because........... ....
98.5 Wash hands with soap all time before eating food.				# Because........ ....
99. You agreed with the measurement of avian influenza control in your village on the issues: 99.1 Gather poultry carcass because of sickness/dead with unknown cause to bury or burn appropriately.				# Because...........
99.2 When chicken or poultry get sick or dead, inform livestock animal officer, village head, or Tambon Administrative Organization.				# Because........ ……………
100.You satisfied or agree with the empowerment method for the key community stakeholders to prevent and control the avian influenza in the village.				# Because........ ....
101.You satisfied or agreed with the working network to prevent and control the avian influenza covering every place in the village.				# Because........ ....
102. You satisfied or agreed with your village plan, implementation, and evaluation of avian influenza prevention and control by the cooperation of people in the village and supported by the authorities.				# Because........ ....
103. You satisfied with the capacity of the key community stakeholders that they can educate and counsel about avian influenza problem to people in the village.				# Because........ ....

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Part 5 People's participation in the activities of avian influenza prevention and control in the study village.

Please mark √ in the blank that you have chosen and/or put the explanation in the blank if possible.

104. Did you know the methods or activities of the avian influenza prevention and control of the key community stakeholders?

Yes, from (specify)…………………………

What did he or she do with you? (specify)………………

No, because (specify)……………………………

105. Have you participated in the procedure or method to prevent and control the avian influenza with the key community stakeholders?

Yes, what have you done? (specify)………………………

The frequency of participation # Sometimes # All time

No, because (specify) ……………………………

106. Have you performed or worked on the activities to prevent and control the avian influenza according to the advice of the key community stakeholders?

Yes, what have you done? (specify)………………………

No, because (specify) ……………………………

107. After you participated in the activities of the prevention and control of avian influenza with the key community stakeholders, have you talked about the avian influenza to the other people?

Yes, who were the people that you have talked to? (Specify) …………….

No, because (specify)………………………………………………..

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In-depth Interview Guideline for Key Community Stakeholder Regarding Baseline Data of Vang Ta-Ku Village, Thung Khok Sub-district.

Topics	Key Stakeholders	Questions
1. History of the community	Formal and informal community's leaders	- When was the community established? - How was it established? - Who established the community? - Where did they come from? - Why did they call "Ban Vang Ta-ku"? - How many groups of people are there in the community now?
2. General data of the community - Physical environment	Formal and informal community's leaders	- What is the boundaries of this community? - How many areas are there in the community? - What kind of land are there in the community? - How do people use the land? - What kind of soil and water sources is there in the community? - How many natural water sources are there in the community? If there isn't any water source in the community, where do they get water from? - What are the conditions of water sources that people used? - How many seasons are there in the community? When does each season start and end? - How many poultry farms are there in the community? - Is there a slaughter-house in the community?

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In-depth Interview Guideline for Key Community Stakeholder Regarding Baseline Data of Vang Ta-Ku Village, Thung Khok Sub-district (Cont.).

Topics	Key Stakeholders	Questions
-Conditions of houses	Formal and informal community's leaders	- How far are the houses from the water sources and the cultivated land? - What types of house are there in the community? - How do people use indoor and outdoor areas of their houses?
-Type of domestic animals	Formal and informal community's leaders	- What are the most of domestic animals that people raised in the community and why? - What are means of raising those domestic animals?
-Transportations and Communications	Formal and informal Community's leaders	- How far is the community from the town? - What kinds of transportations and communications do they use in the community?
3. Characteristics of the population - Migration	Formal and informal Community's leaders	Is there any migration? What kinds of people migrate, when and why?
- Race, Religion and Beliefs	Formal and informal Community's leaders	- How many ethnic groups are there in the community? - What religion do they have? - What are their believes about domestic animals and pythons?

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In-depth Interview Guideline for Key Community Stakeholder Regarding Baseline Data of Vang Ta-Ku Village, Thung Khok Sub-district (Cont.).

Topics	**Key Stakeholders**	**Questions**
- Education	Formal and informal Community's leaders	- Are there any schools in the community? - Where were they established? - How many levels are there in those schools? - Are there any informal education? - What are the educational levels of the people in the community?
- Languages	Formal and informal Community's leaders	- What are languages do they use to communicate in the family, neighbors and outsiders?
4. Economics - Career	Formal and informal Community's leaders	- What careers do people have, both main and supplementary career? - What agricultural activities do people do in a year?
- Income	Formal and informal Community's leaders	How do the people get their income?
- Economic Status	Formal and informal Community's leaders	- Do most people have their own land? - If they don't have their own land, what do they do? - Do they rent any land? - What are the renting rate? - What is the economic status of the people? (Using economic status questionnaires)

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In-depth Interview Guideline for Key Community Stakeholder Regarding Baseline Data of Vang Ta-Ku Village, Thung Khok Sub-district (Cont.).

Topics	**Key Stakeholders**	**Questions**
5. Social and cultural background - Family institution	Formal and informal community's leaders and the high risk people	- What are the characteristics of the families? - What kinds of social relationship are there in the among families? - Do they separate male and female roles? - How do they have division of labor on the farm among fathers, mothers, sons and daughters? - What activities do the families do when they are free from the farm? - Who do these activities? Males or females? - When do they do these activities?
- Governmental institution	Formal and informal community's leaders	- What form of government does the community have? - Who is the leader of the community - Who choose the community committee? - How do they elect the community committee? - What are the duties of the leaders? - What is the relationship between the older persons and the younger ones? - How much do the older people guide or transfer their experiences to the younger generation? - What are the relationship patterns in the community? - How much do they help each another?

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In-depth Interview Guideline for Key Community Stakeholder Regarding Baseline Data of Vang Ta-Ku Village, Thung Khok Sub-district (Cont.).

Topics	Key Stakeholders	Questions
		- Do the villagers have activities together? If they, how do they happen? - How does each group perform? - When the family members get sick, who decide the patterns of treatment?
- Religious institution and beliefs		- Whom do they consult? - Do they help each other to some health problem? How? - What are the roles of monks and temples in the community? - What are the ceremonies, customs of the community?
6. Medical systems public health	- The risk people - Medical personnel	- Where your family members get sick, how do you manage those sickness? (in detail) - Are there any folk healing, drugstores, groceries, primary health centers, public health centers in the community? - What kinds of symptoms or diseases do the villagers can cure by themselves? - What kinds of symptoms or diseases do the villagers need medical personnel? Who are those medical personnel? - Where do they live? - What kinds of disease do most villagers have? - What is the epidemiology of those diseases? - What kinds of treatments do they prefer? - What is the result of those treatments?

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In-depth interview toward the respect and self-esteem of key communities and household representatives

Questions for self-esteem	Questions for interview
1. Feeling of having less worth than others.	Do you feel that you have less worth than others? ☐ Yes ☐ No Why do you feel like that? Do you feel that you have weakness or disadvantage the same as others?
2. Feeling of success in life.	Do you think you succeed in your life or your work? ☐ Yes ☐ No Why do you feel like that? What kind of work or success make you feel like that?
3. Feeling of failure in life	Do you think that you fail in your life or your work? ☐ Yes ☐ No Why do you feel like that? What kind of duty or work make you fail?
4. Feeling of ability to do thing the same as others	Do you feel that you can do thing the same as others? ☐ Yes ☐ No Why do you feel like that? What kind of ability do you have the same as others?
5. Feeling of no prestige	Do you feel that you do not have prestige? ☐Yes ☐ No Why do you feel like that? What kind of duty or work make you feel like that?
6. Feeling or positive attitude to yourself.	Do you have positive attitude to yourself? ☐Yes ☐ No Why do you feel like that? What make you have negative attitude to yourself?
7. Satisfaction of yourself.	In overall, do you satisfied of yourself? ☐Yes ☐ No Why do you feel like that? What make you feel like that?

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In-depth interview toward the respect and self-esteem of key community members and household representatives (cont)

Questions for self-esteem	Questions for interview
8. I wish I could have more respect of myself.	Would you like to develop yourself to meet your satisfaction? □Yes □ No What issues do you want to develop for yourself? Why do you develop in these issues?
9. Feeling of being helpless.	Do you feel that you are helpless? □ Yes □ No What make you become helpless? What weakness or disadvantage do you have?
10. Feeling of no good thing	Sometimes do you feel that you do not have good things in yourself? □Yes □ No What make you think like that? What kind of disadvantage makes you have no good thing at all?

Questions toward prevention and control of avian influenza in Vang Ta-Ku

Village Moo 8 Tambon Tung Khok

1. Do you think that prevention and control of avian influenza project that Mr. Tavorn Maton, key community and people in community have conducted are useful to your community?

□ Yes □ No because……………………..

If yes, what activities did the project contribute and those are useful to your community?

……………………………………………………………………………………
……………………………………………………………………………………
……………………………………………………………………………………
……………………………………………………………………………………
……………………………………………………………………………………

2. Do you think recently the situation or problem of avian influenza in your community are getting better?

□ Better □ The same □Worse

Why do you think like that?

……………………………………………………………………………………
……………………………………………………………………………………

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APPENDIX E

No. 81/2005

Documentary Proof of Ethical Clearance
The Committee on Human Rights Related to
Human Experimentation
Mahidol University, Bangkok

Title of Project: Development of a Community-Based Model to Prevent Avian Influenza in Song Phi Nong District, Suphan Buri Province, Thailand
(Thesis for Ph.D.)

Principle Investigator: Mr. Tavorn Maton

Name of Institution: Faculty of Tropical Medicine

Approved by the Committee on Human Rights Related to Human Experimentation

Signature of Chairman: ....
(Professor Dr.Srisin Khusmith)

Signature of Head of the Institute: ....
(Professor Dr.Pornchai Matangkasombut)

Date of Approval: 20 JUN 2005

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APPENDIX F

Inform Consent

Research Topic : Development of a community-based model to prevent avian influenza in Song Phi Nong district, Suphan Buri province, Thailand

Date of consent: day…………month…………………year………………..

Before signing in the form to participate in the study, I have been completely explained by the researcher concerning the objectives, methodology, harmfulness or related symptom derived from the study, and the significance of the study. I understand clearly in all aspects.

The researcher assures that all my required questions will be answered openly until I satisfy and understand. Moreover, I can give up to participate in the study whenever I want. I am willing to participate in the study and if I give it up, it will not affect me in any circumstances.

The researcher assures that all my information will be kept secretly and it can be disclosed in term of the conclusion of the study. In order to disclose my information to the relevant persons or institutes, the researcher can only do for the academic purpose. The researcher assures that if there is any harmfulness occurred during the study and affects me, I will be supported financially and I will get paid if I am hospitalized with standard cost and disability compensation if possible.

The researcher assures that if there is additional information affects the study, I will be informed openly. After, I have read and understood all information above obviously, I then sign in the form with willingness.

Signature……………………………………consenter

Signature……………………………………witness

Signature……………………………………witness

Hence I am illegible so that the researcher has read and clarified the information to me. Then I sign and put my right finger printed in the form willingly.

Signature……………………………………consenter

Signature……………………………………witness

Signature……………………………………witness

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BIOGRAPHY

NAME	:	Mr. Tavorn Maton
DATE OF BIRTH	:	June 19, 1959
PLACE OF BIRTH	:	Uttaradit, Thailand
INSTITUTION ATTENDED	:	Mahidol University, 1988: Bachelor of Public Health Sukhothai Thammatirat Open University, 1988: Bachelor of Public Health (Public Health) Sukhothai Thammatirat Open University, 1990: Bachelor of Public Health (General Public Health Administration) Mahidol University, 1998: Master of Science (Public Health)
HOME ADDRESS	:	Sirindhon Collage of Public Health Suphan Buri Pvovince, 77 Moo 4, Tapteeleck Sub-district, Maueng District, Suphan Buri Province, Thailand. Tel. 035-525731

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