



CHAPTER IV

RESULTS OF THE STUDY

This chapter presents the results of the data analysis. During a three-week data collection period, two hundred and three households in Supanburi province were contacted and invited to participate. Out of 203 distributed questionnaires 190 questionnaires were returned (95%). Of 190 returned questionnaires, 10 questionnaires (5%) were not included because some answers were missing or incomplete and results of 180 respondents will be presented. Overall response rate has been 95% and non response 5%. This chapter presents quantitative and qualitative data, divided into nine parts.

The first part explains the frequencies and percentages of the Socio-Demographic Characteristics of the respondents. The second part shows the Source of Information about AI. The third part displays information about previous and present poultry farming situations. The fourth part shows attitude regarding Practice and Response during AI outbreaks. The fifth section is divided into two sections attempting to discover where the knowledge gap lies as far as AI is concerned (transmission and source of infection and symptoms of avian flu). The sixth part shows Attitude regarding governmental actions during AI outbreaks and the affected farmer's satisfaction with compensation. Section seven indicates Attitude regarding the changes that occurred in poultry practice. The eighth part shows the relations

between independent and dependent variables. Qualitative data analysis is present in the ninth part of this chapter.

The SPSS program was used for data analysis and group discussion was used to analyze qualitative data.

4.1 SOCIO-DEMOGRAPHIC CHARACTERISTICS OF THE RESPONDENT

From 180 household respondents, more than half of the respondents (50.6%) in this study were 31-50 years of age, 30% were 17-30, and 19.4% were 51-79 years; 55% were male and 45 % were female; 50.6% had a secondary school background, 36.1% primary school, 11.1% never attended school and 2.2% were college/university educated.

Almost half of the respondents were farmers (48.9%), 22.8% employees, 13.3% housewives, 12.2% in private business and 2.8% students.

More than a quarter (27.2%) of the respondents earned between 3,000-4,000 baht per month, 25.6% had an income of 5,000-10,000 baht, 19.4% 3,000-4,000 baht, 17.2% less than 3,000 baht and 10.6% earned more than 10,000 baht per month. The majority (70%) had children in the household.

The Socio- Demographic characteristics of respondents are presented in Table 1.

Table 1: Frequency and percentage Distribution of villager-respondents by Socio Demographic Characteristic (n=180)

Socio-demographic Characteristics	Number	Percentage	Mean	S.D. %
Age of adults (years)				
17- 30 years	54	30.0		
31-50 years	91	50.6	39.2	12.49
51-79 years	35	19.4		
Gender				
Male	88	55.0		
Female	81	45.0		
Education				
Never attended school	20	11.1		
Primary school	65	36.1		
Secondary/College	95	52.8		
Occupation				
Farmer	88	48.9		
House wife	24	13.3		
Private business	22	12.2		
Employee	41	22.8		
Student	5	2.8		
Income per month				
< 3000 Baht	31	17.2		
3,000-4,000 Baht	49	27.2		
4,001-5,000 Baht	35	19.4		
5,001-10,000 Baht	46	25.6		
> 10,000 Baht	19	10.6		
Have children				
Yes	126	70.0		
No	54	30.0		

4.2 SOURCE OF INFORMATION ABOUT AVIAN INFLUENZA

The respondent could choose more than one answer in the questionnaire about the sources of information. Almost everyone (97.2%) of the respondents had received some information about AI from general television broadcasts. Radio and newspapers are the next common source of information (radio 65%, newspapers 63.3%, brochures 20% and only 0.6% from the internet).

The majority of respondents (72.2%) had health volunteers come to their home to give them information about AI.

Table 2 presents data about Sources of Information.

Table 2: Frequency and percentage of distribution of villager-respondents of

Source of Information about AI (n=180)

Items	Number	Percentage (%)
Did you ever receive information about avian flu?		
Yes	175	97.2
No	5	2.8
Source of information regarding AI		
Television	175	97.2
Radio	117	65.0
Newspaper	114	63.3
Brochures	36	20.0
Internet	1	0.6
Direct information from Village Health Volunteers		
Yes	130	72.2
No	50	27.8

4.3 INFORMATION ABOUT THE PREVIOUS AND PRESENT POULTRY FARMING SITUATION

Table 3 shows that out of 180 respondents 46.1% are raising poultry now, and 25% of 180 respondents have had affected poultry (sick from AI or culled). From these 180 respondents 53.9% are not poultry farmers. Although 53.3% of respondents never had birds, 17.8% have the same number of poultry as before the outbreaks, 16.1% had more birds before the first outbreaks of AI at the beginning of January 2004 and 10.6% have less than before. Only 2.2% do not remember the number of poultry they had before. No one declared affected ostriches or quail.

Of the 84 respondents who gave information about their farming situation only 83 (46.1%) of them have poultry now. Only one responder had raising backyard chickens before and when they were affected with AI he stopped rising chickens altogether.

Analysis of independent variables showed that from 180 of respondents, 75% were not affected, 25% of respondents had poultry affected by AI (Table 3).

Almost 70% of farmers were affected in the first outbreak in January 2004, 13.4% in April 2004, 6.7% in November 2004 and 11.1% in August 2005.

Table 3: Percentage and number of respondents to question on information about previous and present poultry farming situation

Items	Number	Percentage %
Present poultry farmers		
Yes	83	46.1
No	97	53.9
Did your birds was affected		
Yes	45	25.0
No	135	75.0
How many birds they had before outbreaks		
Never had birds	96	53.3
Same number as now	32	17.8
Before more than now	29	16.1
Now more then before	19	10.6
Don't remember	4	2.2

As shown in table 4, there were 46.1% of current poultry farms and 25% of these were affected by AI. The AI affected number of households with fighting cocks was 7 but one household with fighting cocks was additional culled because they house were in the radius zone.

There is a significant association between AI sick backyard chicken and surviving backyard chickens (p value 0.001). The backyard chicken surviving percentage is bigger than the dead percentage.

Table 4: The number of present poultry farms, the current poultry farming situation and the number of dead or culled birds for the same farms

Number of present poultry	Number (%) of farms	Min per farm	Max Per farm	Total number	Mean	S.D.
Backyard chickens	39 (21.7)	2	80	1080	27.6	23.4
Laying Hens	23 (12.8)	30	45000	162110	7048.2	11406.8
Fighting cocks	23 (12.8)	3	200	1057	45.9	52.0
Ducks	7 (3.9)	3	1500	1752	25.2	555.6
Quail	0 (0)	0	0	0	0	0
Ostrich	0 (0)	0	0	0	0	0
Number of sick-affected backyard	18 (10.0)	1	300	1456	80.8	84.3
Number of sick-affected laying Hens	20 (11.1)	10	24000	117942	5897.1	7133.9
Number of sick-affected fighting cocks	7 (3.9)	4	200	484	69.1	67.5
Number of sick-affected ducks	6 (3.3)	8	3000	3333	555.5	1199.6
Number of dead or culled Backyard chicken	18 (10.0)	1	200	1304	72.4	67.0
Number of dead or culled laying Hens	20 (11.1)	10	24000	117842	5892.1	7138.1
Number of dead or culled fighting cocks	8 (4.4)	4	200	488	61.0	66.6
Number of dead or culled ducks	6 (3.3)	6	3000	3169	528.1	1211.4
Total Number of Affected farm	45 (25.0) farms	1 bird	24000 birds	123103	2735.6	5508.7

4.4 Knowledge regarding practice, Response and precaution for AI

In this section of the questionnaire were 19 questions which ascertained knowledge regarding practice in poultry handling and response in case of contact with sick birds as presented in Table 5. All respondents were asked to answer this part of the questionnaire with only one answer of choice (whether they are raising poultry or not). Respondents were tested for their approach and what they will do if they have or they are in contact with any sick birds. Questionnaire has both statements positive and negative. There were 7 positive statements, question # 1,2,3,4,5,14,15 and 12 negative statements, question # 6,7,8,9,10,11,12,13,16,17,18 and 19.

The rating scale measurements as follows.

Positive statements		Negative statements	
Choice	scores	Choice	scores
Agree	2	Agree	0
Not sure	1	Not sure	1
Disagree	0	Disagree	2
Bury	2	Kill and sale	0
Burn	2	Cook it as food	0
		Treat	0

The attitude level of respondents was classified as good, moderate and poor as in Table 6.

As many as 35% of all the 180 respondents answered they will first try to cure the birds before informing the authorities, 32.8% respondents will wait for some days before telling anyone and 66.7% of respondents will inform the authorities as soon as possible.

The majority of respondents 71.6% answered correctly the question about what to do with a sick chicken.

Half of respondents 50.6% agree that it is good to close birds inside the property and as many as 81% of respondents agree to separate the sick bird from the others. More than half of respondents 58.3% disagree with burying sick or dead chickens and sending the others for sale, the same percentage 58.3% agreed not to hide that neighbors have dying birds.

One fifth of respondents 22.8% are not sure and 13.3% agree that they will kill sick birds and cook well to eat and 68.9% disagree with the killing of sick birds and selling them and 61.1% will not move sick birds to a new place or house.

Precaution score was positive and highly correlated significant with knowledge score ($R=0.719$, $p<0.001$).

Table 5: Percentage and number of respondents to questions regarding practice and responses for AI outbreak

Question	Number	Percentage
Handling of sick birds during AI outbreak		
Kill and sale	8	4.4
Bury	125	69.4
Cook it as food	7	3.9
Treat	36	20.0
Burn	4	2.2
To close birds inside property during AI outbreak		
Agree	91	50.6
Not sure	18	10.0
Disagree	71	39.4
Separating sick birds		
Agree	146	81.1
Not sure	25	13.9
Disagree	9	5.0
Insure that nobody will go inside until authority comes		
Agree	139	77.2
Not sure	26	14.4
Disagree	15	8.3
Use protection to touch sick birds		
Agree	144	80.0
Not sure	32	17.8
Disagree	4	2.2
Do nothing		
Agree	23	12.8
Not sure	35	19.4
Disagree	122	67.8
Try to cure birds first		
Agree	63	35.0
Not sure	34	18.9
Disagree	83	46.1

Table 5: (Continues) Percentage and number of respondents to questions regarding practice and responses for AI outbreak.

Question	Number	Percentage
I will not tell anyone		
Agree	14	7.8
Not sure	42	23.3
Disagree	124	68.9
Wait before asking for help		
Agree	59	32.8
Not sure	37	20.6
Disagree	84	46.7
My neighbors have dying birds but I will not tell anyone, we are good friends		
Agree	39	21.7
Not sure	36	20.0
Disagree	105	58.3
I will bury sick or dead and the others I will sell		
Agree	44	24.4
Not sure	31	17.2
Disagree	105	58.3
Kill all birds and sell them		
Agree	28	15.6
Not sure	28	15.6
Disagree	124	68.9
Kill them and cook well to eat		
Agree	24	13.3
Not sure	41	22.8
Disagree	115	63.9
Inform local authority		
Agree	120	66.7
Not sure	34	18.9
Disagree	26	14.4

Table 5: (Continues) Percentage and number of respondents to questions regarding practice and responses for AI outbreak.

Question	Number	Percentage
Disinfect my property		
Agree	149	82.8
Not sure	18	10.0
Disagree	13	7.2
Call witch doctor		
Agree	5	2.8
Not sure	15	8.3
Disagree	160	88.9
Pluck the feathers		
Agree	4	2.2
Not sure	12	6.7
Disagree	164	91.1
Change the food given		
Agree	15	8.3
Not sure	22	12.2
Disagree	143	79.4
Move them to new place or house		
Agree	50	27.8
Not sure	20	11.1
Disagree	110	61.1

The attitude level of respondents regarding practice and response in the event of AI outbreaks is presented in Table 6, classified as good, moderate and poor with 38 points as the maximum and the respondents in the poor group with a minimum of 14 points. Table 6 shows that 48.9% had a moderate knowledge of practice, 36.7% of respondents had a poor level and 14.4% had a good level.

Table 6: Frequency and percentage of respondents classified in level groups regarding practice and response for AI

Level	Number	Percentage	Mean	S.D
Poor: 14-22	66	36.7%	19.30	2.36
Moderate: 23-34	88	48.9%	28.89	3.25
Good: 35-38	26	14.4%	36.54	1.19

Good: Score > Mean + S.D; Moderate: Score = Mean \pm S.D; Poor: Score < Mean - S.D.

4.5 Knowledge of avian influenza

This section is divided in three knowledge parts.

4.5.1 Describe questions regarding AI knowledge (13 questionnaires)

4.5.2 Describe, Knowledge about **transmission** and source of Avian Influenza infection (11 questionnaires) and

4.5.3 Describe basic knowledge about **symptoms** of Avian Influenza infection (15 questionnaires).

4.6 Knowledge regarding AI

Table 7 presents the number and the percentage of responses to selected questions regarding AI knowledge. There were 13 questions regarding knowledge for AI with 7 positive statements in question # 1, 2, 3, 4, 5, 8 and 11. Negative statements were in question 6,7,9,10,12 and 13.

Positive statements		Negative statements	
Choice	Scores	Choice	Scores
Absolutely agree	3	Absolutely agree	0
Agree	2	Agree	1
Not sure	1	Not sure	2
Disagree	0	Disagree	3
Yes	2	Yes	0
No	0	No	2
Don't know	1	Don't know	1
		Not if is well cooked	1

Nearly 72% think that eating sick or dead chickens is dangerous and actually 46.7% think that it is dangerous to eat eggs from sick chickens.

Furthermore, only 45% of respondents claimed that there is no specific medication for AI in poultry, 47.8% don't know and 7.2% of respondents think there is specific medication.

The majority of respondents 83.3%, think that AI is a dangerous disease, nearly 14% don't think it is dangerous and only 2.8% of respondents don't know. Nevertheless, 60.6% of respondents believe that vaccination will stop the disease, 23.3% are not sure and 16.1% don't think that vaccination will stop it. However, almost 60% of respondents absolutely agree or agree that if you are in good health you can not get avian flu, 22.8% disagree and 17.2% are not sure.

Around 46% of respondents absolutely agree or agree that AI is not so dangerous as they have been told, around 32% disagree and around 22% are not sure. Even now 46.6% of respondents absolutely agree or agree that a strong and healthy child cannot get AI, 33.9% disagree and 19.4% are not sure.

Table 7: Percentage and number of respondents to questions about AI knowledge

Question	Number	Percentage
Do you think AI is a dangerous disease?		
Yes	150	83.3
No	25	13.9
Don't know	5	2.8
AI is transmissible from one chicken to another?		
Yes	147	81.7
No	10	5.6
Don't know	23	12.8
Is it dangerous to use birds' dung as fertilizer?		
Yes	83	46.1
No	62	34.4
Don't know	35	19.4
Is it dangerous to eat sick or dead chickens?		
Yes	129	71.7
No	7	3.9
Don't know	14	7.8
Not if well cooked	30	16.7
Is it dangerous to eat eggs from sick birds?		
Yes	84	46.7
No	23	12.8
Don't know	27	15.0
Not if well cooked	46	25.6
Poultry vaccination will stop disease		
Yes	109	60.6
No	29	16.1
Don't know	42	23.3
There is a specific medication for poultry as treatment of avian flu		
Yes	13	7.2
No	81	45.0
Don't know	86	47.8

Table 7: (Continues) Percentage and number of respondents to questions about AI knowledge.

Question	Number	Percentage
Veterinarian periodical control of poultry is necessary		
Yes	112	62.2
No	32	17.8
Don't know	36	20.0
Avian flu is a personal problem		
Absolutely agree	28	15.6
Agree	58	32.2
Not sure	27	15.0
Disagree	67	37.2
If you are in good health you can not get avian flu		
Absolutely agree	44	24.2
Agree	64	35.6
Not sure	31	17.2
Disagree	41	22.8
AI is dangerous because it can kill people		
Absolutely agree	88	48.9
Agree	64	35.6
Not sure	20	11.1
Disagree	8	4.4
AI is not as dangerous as they say		
Absolutely agree	23	12.8
Agree	60	33.3
Not sure	39	21.7
Disagree	58	32.2
Strong and healthy children cannot get AI		
Absolutely agree	15	8.3
Agree	69	38.3
Not sure	35	19.4
Disagree	561	33.9

Maximum was 33 points and minimum was 6 but no one get maximum points. The table 8 shows knowledge level of respondents; 67.2 % had moderate level, 21.7% has good level and 11.1 % had poor level.

Table 8: Level of AI knowledge

Level	Number	Percentage	Mean	S.D.
Poor: 6-16	20	11.1%	12.4	2.6
Moderate: 17-27	121	67.2%	22.5	2.7
Good: 28-33	39	21.7%	30.1	1.8

Good: $\text{Score} > \text{Mean} + \text{S.D}$; Moderate: $\text{Score} = \text{Mean} \pm \text{S.D}$; Poor: $\text{Score} < \text{Mean} - \text{S.D}$

4.6.1 Knowledge about transmission and source of Avian Influenza infection

This section extracts respondents' attitude to their understanding of the transmission of AI as well as understanding the sources of infection. Table 9 recounts the percentage and the numbers of respondents mentioning the method of poultry infection. There were 11 questions regarding transmission and source of Avian Influenza infection with both positive and negative statements.

Positive statements		Negative statements	
Choice	Score	Choice	Scores
Yes	2	Yes	0
No	0	No	2
Don't know	1	Don't know	1

The majority know that contact with sick birds (87.7%) and saliva from them (76.1%) are methods of transmission of infection.

Almost 54% think that the way the birds get infected can be by eating dirty food or water, 30.6% do not and 16.1% don't know. As many as 59.4% think that birds can get infected from human colds, 23.9% of respondents answered correctly and the rest 16.7% don't know. Half of the respondents (50.6%) don't believe that there is a connection between AI infection and a curse, 37.8% don't know and 11.7% of responder's answer that it is.

Although 45.6% of respondents think that poultry can get infections from dogs or cats, 28.9% don't think so and 25.6% don't now.

Table 9: Percentage and number of respondents mentioning the ways that poultry can get infected

Question	Number	Percentage
Contact with other sick birds		
Yes	158	87.8
No	14	7.8
Don't know	8	4.4
Insect bites		
Yes	66	36.7
No	70	78.9
Don't know	44	24.4
Contact with eggs		
Yes	112	62.2
No	35	19.4
Don't know	33	18.3
From dogs or cats		
Yes	82	45.6
No	52	28.9
Don't know	46	25.6

Table 9: (Continues) Percentage and number of respondents mentioning the ways that poultry can get infected.

Question	Number	Percentage
Contact with humans who have colds		
Yes	107	59.4
No	43	23.9
Don't know	30	16.7
Only during raining season		
Yes	34	18.9
No	75	41.7
Don't know	71	39.4
Contact with person who put a curse on you		
Yes	21	11.7
No	91	50.6
Don't know	68	37.8
Contact with saliva from sick chickens		
Yes	137	76.1
No	25	13.9
Don't know	18	10
Eating bad food or dirty water		
Yes	96	53.3
No	55	30.6
Don't know	29	16.1

As shown in Table 10, a moderate level of knowledge regarding transmission of AI had 58.3% of respondents; around 23% had a good level and a little more than 18% a poor level. A maximum point was 22 and minimum was 5 points.

Table 10: Level of knowledge of transmission and spreading of AI

Level	Number	Percentage	Mean	S.D.
Poor: 5-9	33	18.3%	7.7	0.9
Moderate: 10-15	105	58.3%	12.1	1.7
Good: 16-22	42	23.3%	17.6	1.8

Good: Score > Mean + S.D; Moderate: Score = Mean \pm S.D; Poor: Score < Mean – S.D

4.6.2 Basic knowledge about symptoms of Avian Influenza infection

Table 11 shows that around 41% of respondents think that sick birds are more active than usual, around 37% don't think that and almost 23% don't know. Furthermore almost 79% think that sick birds are weak and quiet, around 23% don't know and 9.4% say they are not. Almost two thirds (69.4%) know that AI sick birds have closed or watery eyes and a swollen head, 15.6% don't know and 15% did not think so. There were 56.1% respondents who said that sick birds have diarrhea, around 29% don't know and 15% did not think so. It was thought by 43.9% of respondents that sick birds are losing feathers, 21.1% don't think so and 35% don't know. Nearly 78% of respondents thought that sick birds died suddenly, nearly 14% don't know and 8.3% did not think so.

More than two thirds (72.2%) of respondents thought that AI sick birds were breathing with difficulty, 17.8% did not know and 10% of respondents answered that sick birds did not have breathing difficulties.

Table 11: Frequency and percentage of respondents regarding Symptoms of sick Birds

Question	Number	Percentage
Birds with AI are more active than usual		
Yes	73	40.6
No	66	36.7
Don't know	41	22.8
Birds with AI show weakness and quietness		
Yes	142	78.9
No	17	9.4
Don't know	41	22.8
Birds with AI show closed or watery eye, swollen head		
Yes	125	69.4
No	27	15.0
Don't know	28	15.6
Birds with AI have ruffled feathers		
Yes	105	58.3
No	27	15.0
Don't know	48	26.7
Birds with AI show coughing, sneezing		
Yes	110	61.1
No	25	13.9
Don't know	45	25.0
Birds with AI eat more		
Yes	29	16.1
No	98	54.4
Don't know	53	29.4
Birds with AI lay more eggs		
Yes	22	12.2
No	104	57.8
Don't know	54	30.0

Table 11: (Continues) Frequency and percentage of respondents regarding Symptoms of sick Birds.

Question	Number	Percentage
Birds with AI die suddenly		
Yes	140	77.8
No	15	8.3
Don't know	25	13.9
Birds with AI have diarrhea		
Yes	101	56.1
No	27	15.0
Don't know	52	28.9
Birds with AI stop laying eggs or lay soft shell eggs		
Yes	86	47.8
No	36	20.0
Don't know	58	32.2
Birds with AI are losing feathers		
Yes	79	43.9
No	38	21.1
Don't know	63	35.0
Birds with AI have bloody spots on the legs		
Yes	98	54.4
No	20	11.1
Don't know	62	34.4
Birds with AI have breathing difficulty		
Yes	130	72.2
No	18	10.0
Don't know	32	17.8

There were 15 questions concerning the symptoms of AI infected birds. The respondents who answered correctly for all questions had a maximum of 30 points and the minimum scores were 10 points. Mean was 20.4 and S.D. 4.2 .The majority of

respondents had a moderate level 67.8% followed by a poor knowledge with 19.4% and a good level 12.8% of respondents. See Table 12.

Table 12: Level of knowledge regarding poultry symptoms of AI infection

Symptoms	Number	Percentage	Mean	S.D.
Poor: 10-15	35	19.4%	14.20	1.20
Moderate: 16-24	122	67.8%	21.05	2.41
Good: 25-30	23	12.8%	26.78	1.59

Good: Score > Mean + S.D; Moderate: Score = Mean ± S.D; Poor: Score < Mean – S.D

4.7 Attitude or measure of satisfaction with government actions and compensation for dead or culled birds

In this section there were 6 questions to evaluate the attitude of all 180 respondents regarding satisfaction with government actions taken during the outbreaks of AI.

A full 90% of respondents agreed absolutely or agreed that all the campaigns gave good explanations, 6.7% were not sure and 3.3% of respondents disagreed. Nearly 82% agreed absolutely or agreed with the measures taken during the outbreaks, 11.7% not sure and 6.1% disagreed. About two thirds, 72% of respondents, absolutely agree or agree with the compensation price, 14.4 disagree and 13.3% of respondents are not sure. Nevertheless 90.5% thought that outbreaks of AI caused market losses, 7.8% are not sure about it and 1.7% of respondents disagree. The answers to these questions are presented in Table 13.

Table 13: Frequency and percentage of responder's attitude regarding satisfaction with governmental actions

Question	Number	Percentage
Campaigns about AI give us good explanations		
Absolutely agree	70	38.9
Agree	92	51.1
Not sure	12	6.7
Disagree	6	3.3
I agree with measures taken during outbreaks of AI		
Absolutely agree	80	44.4
Agree	68	37.8
Not sure	21	11.7
Disagree	11	6.1
AI had an impact on income, showing losses		
Absolutely agree	48	26.7
Agree	106	58.9
Not sure	25	13.9
Disagree	1	0.6
AI causes big market losses for Thailand		
Absolutely agree	98	54.4
Agree	65	36.1
Not sure	14	7.8
Disagree	3	1.7
Do you agree with the compensation price for dead or culled birds?		
Absolutely agree	55	30.6
Agree	75	41.7
Not sure	24	13.3
Disagree	26	14.4
Do you think it is not necessary to generate so much awareness?		
Absolutely agree	30	16.7
Agree	53	29.4
Not sure	28	15.6
Disagree	69	38.3

4.8 Attitude regarding changes in poultry handling practice

Table 14 presents the frequency and percentage of responder's precautions and poultry handling practices regarding AI and what they will do or done if they have poultry.

Nearly 69% absolutely agree and agree to keep poultry closed in farm houses to avoid contact with other birds, 20% are not sure and 11.1% disagree with that precaution. The majority of respondents 70% absolutely agree and agree with a net covering the poultry open house or place, 22.8% are not sure and 7.2% disagree.

In addition 41.7% made changes in poultry production, 30% were not sure and 28.3% did not make any changes in poultry production.

Table 14: Frequency and percentage regarding change in poultry practice handling

Question	Number	Percentage
I believe it is good to keep poultry closed in farm houses		
Absolutely agree	63	35.0
Agree	61	33.9
Not sure	36	20.0
Disagree	20	11.1
It is good to put netting on top of poultry places to avoid contact with wild birds		
Absolutely agree	59	32.8
Agree	67	37.2
Not sure	41	22.8
Disagree	13	7.2
I made changes in my poultry production		
Absolutely agree	29	16.1
Agree	46	25.6
Not sure	54	30.0
Disagree	51	28.3

4.9 Relation between Independent and Dependent Variables

When scores were considered as continuous variable, symptoms and transmission of AI were positively and highly significant correlated ($r=0.270$, $p<0.001$). As shown in Table 15. Knowledge related to symptom is not significant related to practice knowledge ($r=0.097$, $p\geq 0.197$).

Table 15: Correlation between symptoms and transmission regarding Avian Influenza

	Symptoms	
	r	p value
Transmission	0.270	<0.001

There are some significant differences in gender responses for the measures taken with sick chickens, shown in Table 16.

Table 16: Association between gender and the measures taken with sick chickens

Variables Gender	Kill the sick birds and sell the others				
	Number (%)	Mean	S.D.	t.	p value
Male	99 (55)	1.42	0.78	-2.207	0.029
Female	81 (45)	1.67	0.68		

Table 17 shows that income was positively and highly significant correlated with basic knowledge score and positively correlated with precaution.

Table 17: Association between Income, AI Knowledge and Precautions

Variables	Income	r	p value
Knowledge		0.227	<0.002
Precaution		0.182	<0.015

Precaution score was positive and highly correlated significant with knowledge score as show in table 18.

Table 18: Correlation between knowledge and precaution

	r	Precaution	p value
Knowledge	0.719		<0.001

The association between lack of knowledge and respondents with secondary school or college education did not remain significant but there was a significant difference in knowledge between the groups especially those without schooling and with only primary school education (Table 19)

Table 19: Association between knowledge gap and education

Variables	Knowledge Gap				
	Education level	Number	Mean	S.D.	t.
Never attended school	20	9.25	4.32	-2.013	0.047
Primary school	65	11.34	3.97		

There is a significant positive association regarding knowledge between farmers who were AI affected and not affected. (Table 20)

Table 20: Association between knowledge and poultry farmers

Affected poultry farmers	Basic knowledge				
	Number	Mean	S.D.	t.	P-value
Yes	45	45.96	7.63	2.522	0.013
No	135	42.97	6.61		

There was no significant association between practice of affected and non affected farmers (p value 0.905) but there was a significant association between symptoms knowledge and affected farmers and non affected farmers as show in table 21.

Table 21: Association between symptoms knowledge and poultry farmers

Affected poultry farmers	Symptoms knowledge				t.	p value
	Number	Mean	S.D.			
Yes	45	22.00	4.3		2.9	0.004
No	135	19.94	4.0			

Table 22 shows that practice score was positive significant correlated with score for transmission knowledge but practice is not significant related to symptom knowledge, no correlation ($r=0.097$, $p \geq 0.197$).

Table 22: Correlation of practice score and transmission knowledge

	r	Practice	p value
Transmission	0.216		<0.004

There is a significant association between knowledge and practice for all respondents shown in Table 23.

Table 23: Association between basic knowledge and practice

Practice	Knowledge n (%)			Total N (%)	Chi-Square	p value
	Poor	Moderate	Good			
Poor	17 (9.4)	9 (5)	0 (0)	26 (14.4)	33.843	<0.001
Moderate	21 (11.7)	50 (27.8)	17 (9.4)	88 (48.9)		
Good	6 (3.3)	43 (23.9)	17 (9.4)	66 (36.7)		

There is a positive association between poultry farmers and poultry dung's use as a fertilizer as described in Table 23.

Table 24: Knowledge about the dangers of the use of poultry dung as a fertilizer

Issue	Present poultry farmers n (%)		Chi-square	P value
	Yes	No		
It is dangerous to use poultry Dung as fertilizers?				
No	33 (39.8 %)	29 (29.9 %)	8.149	0.017
Don't know	21 (25.3 %)	14 (14.4 %)		
Yes	54 (55.7%)	29 (34.9 %)		

There is no significant association between changes in poultry production and affected or non affected poultry farmers.

However there is a significant association between respondents on attempts to cure the birds by themselves (Table 25).

Table 25: Association between respondents and attention to curing

Now raising poultry	Try to cure first n(%)			t.	P-value
	Number (%)	Mean	S.D.		
Yes	83 (46.1)	0.86	0.88	-3.661	<0.001
No	97 (53.9)	1.33			

All poultry farmers are satisfied with the compensation for the dead or culled birds. P value is 0.606 which is not significant.

There is a significant difference for poultry farmers and non farmers groups according to income losses estimates as described in Table 25.

Table 26: Association between respondents and income lost

Now raising poultry	AI causes income losses			t.	P-value
	Number (%)	Mean	S.D.		
Yes	83 (46.1)	2.24	0.59	2.423	0.016
No	97 (53.9)	2.01			

Table 27 shows a significant association between poultry farmers and the rest of the respondents for the necessity of promoting awareness about AI.

Table 27: Association between respondents regarding necessity to promote Awareness

Not necessary to promote so much awareness					
Now raising poultry	Number (%)	Mean	S.D.	t.	P-value
Yes	83 (46.1)	1.94	1.17	2.029	0.044
No	97 (53.9)	1.60			

4.10 Qualitative data analysis group discussions

The other part of the study involved group discussions with affected poultry farmers. The purpose of these interviews was to have more details, remarks and comments from affected farmers and to be able to measure knowledge levels and to find where the knowledge gaps were.

During these group discussions the farmers were asked about their fears as far as AI is concerned. The outcomes were:

- People understand that Avian flu can kill people but they are not fully aware of all the dangers and are not afraid. Almost everyone thinks that if you are in good health you cannot get infected. The habit of slaughtering and cooking sick chickens is still carried out.

For the questions about which media sources give the best information:

- The best sources of information were television as the most widely used source and they appreciate the fact that they can then visualize information, but farmers prefer to have direct contact with health volunteers because they can then ask questions that can be answered instantly.

During group discussion farmers were asked to explain which changes they made in poultry handling in response to AI.

- Farmers agreed that it is good to have netting on the top of poultry houses to avoid contact with wild birds
- Farmers know that direct contact with infected birds and exposure to poultry secretions and excrement from sick birds is the major source of contamination but they are not sure that it is possible to have virus transmission via indirect contact with contaminated surfaces, soil or litter, etc...

Regarding the handling of sick poultry and the handling of poultry for consumption:

- The majority of the farmers touch sick or collect dead birds with their bare-hands
- The use of gloves or protection for the hand when the birds are slaughtered or prepared for consumption is not widely accepted.

For the question in which they were asked if they had informed the children these are the most relevant facts:

- They said that children are not allowed to feed the chicks and most farmers explain to their children that it is dangerous to play with chicks
- They also encourage the children to wash their hands more often

- If they are preparing sick chicks they will not feed them to the children

Farmers were asked for use of disinfectants:

- The majority of the farmers disinfect their property 2 or 3 weeks before starting new flocks
- Mostly of farmers don't know the correct disinfectant they need to use and necessary concentration for disinfection but they explain to the local drug store in which they buy the product what they need to use it for.
- Farmers who have fish ponds under their chicken house used less concentrated formaldehyde because they are afraid to kill the fish.