



Avian Influenza Knowledge, Attitude and Practices (KAP) Survey.

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1. Introduction

H5N1 highly pathogenic avian influenza (HPAI) is currently a threat to global health. Outbreaks in poultry and birds have been reported from 52 countries, and there have been at least 291 confirmed human cases in 12 countries with a crude mortality rate of ~60% since 1997. Thus far, no widespread human-human transmission has been documented although isolated incidents have been observed. Concerns are high that a global pandemic may be imminent.

In Afghanistan, the first 8 H5N1 HPAI cases in poultry were detected in 2006, in Eastern provinces of Afghanistan. In 2007, 9 clusters of cases occurred in poultry in Nangarhar, Kunar and Kabul provinces – probably related to two separate outbreaks. These outbreaks were confirmed by laboratory detection of H5 antigen (by PCR) in samples collected from dead or sick birds. Up to now, no human cases has been detected although in response to the outbreaks, sixty-four suspected cases were detected by doing a fever survey using fever strips in ~6.000 households (~42.000 individuals). All of them were negative following laboratory tests. In Kunar, 1127 poultry belonging to 220 families were killed, 160 000 Afs were distributed as compensations and 5000 birds were vaccinated. In response to these outbreaks a variety of information education and communication campaigns were conducted focusing on the affected areas. These focused campaigns aim to educate and change behavior of affected communities in terms of poultry handling, exposure to potential hazards, and general hygiene.

In terms of disease surveillance and control, the MOH has settled 8 Disease Surveillance Offices in 8 provinces. These Disease Surveillance Offices are part of the Disease Early Warning System, an information bridge between health facilities and the Ministry of Health, with support from WHO. The MOH is also currently setting up Rapid Response Teams in 14 provinces, in charge of AI surveillance and the reporting of information from communities and health facilities.

Veterinarian networks in Afghanistan are supervised by different NGOs (MADERA etc). These networks are financed, predominantly, by USAID and EU. They consist of networks of paravets dispatched on Veterinary Field Units as well as veterinarians in charge of diagnosing dead birds. Paravets are supposed to report to vets any dead animals. The veterinarian is responsible for reporting cases to provincial services and doing diagnosis. However the network's meshing is quite large and many cases are likely not to be reported. Some regions are better covered than others. For instance, southern regions have almost no veterinarians. It is not usual for Afghan farmers to visit the veterinarian. Only big animals, that represent a lot of money, are vaccinated. Usually, poultry is not vaccinated.

Vaccination campaigns and culling operations were conducted in the regions where AI poultry cases were found. These vaccinations may create some problems in the future, as Pascal Arthaud, country director of MADERA, stated:

“The problem with this bird vaccination campaign is that if next year dead birds are found, we won't be able to diagnose bird flu. Birds will carry the strain and we won't be able to say if the bird died because of Avian Influenza or because of some other disease.”

2. Aim of the survey

This study has been designed to assess the effectiveness of previous AI IEC campaigns and inform future communications campaigns of the KAP of the general population. The effectiveness of previous

campaigns was assessed in order to estimate whether the level of concern was proportionate to the level of threat.

The primary aim of the study was to measure the difference in perceptions between provinces with recent exposure to AI (Nangarhar, Kabul) and provinces with no experience. AI affected areas were exposed to intensive IEC campaigns since the first AI outbreaks were recorded in Afghanistan. People from these areas were therefore expected to have better knowledge attitudes and practice. We also wanted to estimate how socio-economic status, sex, and age influence people's Knowledge, Attitudes and Practices. Finally, we wanted to measure the correlation between authority figure's knowledge and community's knowledge.

The principle hypothesis was that the knowledge attitudes and practices towards AI would be significantly better in areas previously exposed to IEC materials in areas where AI has been reported.

3. Methodology of the survey

The survey was conducted in 5 provinces of Afghanistan which represent the geographic diversity of the country (Herat for the Western region, Samangan for the Northern region, Nangarhar for the Eastern region, Kandahar for the Southern region, Kabul for the Central region) over a period of three weeks from May, 5th - 29th 2007 and combined qualitative and quantitative research methods.

Altogether, 400 household and children questionnaires were filled in, 100 one-to-one interviews with authority figures and 100 observations were conducted in poultry farms and butcher shops. Fieldworkers also reported on hygiene conditions of the households they visited. The research protocol was approved by the Institutional Review Board from the Ministry of Public Health.

2 fieldworkers (one man and one woman) per province were assigned to fill in questionnaires and conduct observations in specific locations (individual households, butcher shops, backyard and commercial poultry farms). Each province received a similar number of questionnaires (100 per province) but the majority (78%) of the questionnaires was filled in rural areas in order to respect our sampling frame.

Within each province, at least two districts were covered. 4 villages in each district were selected using the randomization function of Excel. Accessibility and security issues were also taken into account once on fieldwork. The following locations were selected by "lucky draw" for districts and provinces, and using Excel randomization function for the villages, so that we ensured three levels of random selection:



Herat province: Gulran district (Buzan-i-Bala, Lushabak, Karez-i-Sakharya, Gawdar), Injil district (Sakhez, Aziz Rud, Nagwan, Qal'a-i-Habib Khan)

Samangan province: Khuram-i-Shahar bagh (Sor Ab-i-Bala, Darun Zaw, Kunda-i-Kalan, Deh-i-Naw) , Azrati Sultan (Chaqmaqly, Nawabadi Ghaznigak, Mangala, Aq Gonbaz).

Nangarhar province: Jalalabad district (Kakaran, Malik Bela, Nahre Shahi, Tangi Tokchi), Surkh Rod district (Kuz Kakokhel, Qal'eh-ye Afandi, Karwanda, Nabo Kala)

Kandahar province: Kandahar district (Saydjan Kala, Shahre Naw, Bala Dehe'Ulya, Rawanay), Shah Walikhot district (Mardanza'I, Lwar Shalizar, Wiyan, Ghafur Kalay)

Kabul province: Dah Sabaz (Saydhasan, Pule Sangi, Qal'eh-ye Zanabad(Sadre A'zam), Yakadarakht), Shakar Dara (Qal'eh-ye Morad Beg, Qal'eh ye Dasht, Seawquli, Gozar) .

This sampling frame allowed a relatively robust assessment of the KAP of the general population. It provided a representative sample of gender, and included children. The sampling areas selected represent a broad range of environments in rural Afghanistan.

SAMPLE SIZE:

The primary outcome variable compares level of KAP in areas exposed to IEC activities / AI outbreaks to areas with no activities and no AI outbreaks. Assuming the proportion of respondents with high KAP scores in the exposed areas is 50% and those in the unexposed areas is 35% (a difference of 15%) a sample size of 364 gives 90% power to detect this difference at the 95% confidence level. To allow for missing data (10%), 400 questionnaires were administered.

4. Study tools

A multiple choice questionnaire in Dari and in Pashto was created for the study, based on information from the World Health Organization and Centers for Disease Control as well as with the support of

experts from organizations involved in AI prevention programs such as the MOPH, APHI, MAIL, FAO, UNICEF and WHO.

The questionnaire was subjected to a pilot trial on 50 households before it was distributed in its final form. The questionnaire was found to be consistent, reliable and easy to read. The questionnaire contained 51 items, and included socio-demographic data, questions regarding knowledge, sources of information and concerns about avian influenza. The knowledge section comprised questions about the definition of avian influenza, causative agent, method of transmission to humans, the likelihood of human infection compared with bird infection, means of prevention and control. Concern questions asked respondents if they feared that they or any of their family members were at-risk of avian influenza, whether they expected cases of avian influenza in their village in the current year and what they would do if cases of infection were discovered in their area. In addition to household, a simplified KAP questionnaire was developed for children, who represented 20% of our sample. Children above 9 years old were interviewed in schools.

The KAP questionnaires were scored by a panel of health and veterinary experts in order to create an index score upon which to evaluate participants' knowledge, attitudes and practices. Questions asked and observations made have different relative importance in terms of disease control. Each question was reviewed by the panel and questions were graded as highly important, moderately important, or important. Each "highly important" question was given 5 points for the correct answer(s); 3 points for moderately important; and 1 point for important. Thus for a correct answer to a highly important question, respondents score 5 points and 0 for a wrong answer. This allows a weighted index score to be given to each questionnaire. The weighted index scores of respondents will then give an accurate measure of the level of knowledge, attitude, and practice in terms of its importance to disease prevention and control. The quartiles of these scores can then be used to describe levels of knowledge attitudes and practice in relation to dependent variables (e.g. socio-economic status, poultry ownership, sex, age, etc).

Socio-economic status was considered to be a key factor in the KAP survey. In order to assess relative socio-economic status, data was collected on household assets ownership, education level, and employment. These data were classified using principle components analysis to generate an index based on the data. The index scores were sorted numerically (the highest score signifying the highest socio-economic status) and divided into 5 equal sized classifications (quintiles) from the poorest to the least poor (TABLE 2)

In addition to questionnaires, surveyors conducted direct observations in bazaars, butcher shops, live bird markets and poultry farms. This method allowed making comparisons between respondents' answers to practice questions and the actual behaviors observed in locations that could be considered as major transmission centers.

Finally, surveyors conducted one-to-one interviews with authority figures (heads of Health and Agriculture Departments, health and veterinary personnel, teachers, mullahs, community leaders) in order to allow a deeper insight into the population's awareness and concern towards Avian Influenza. These interviews were coded, using open coding patterns in order to assess respondents' level of concern, their knowledge of the disease, the preventive measures they thought were necessary to take, risky behaviors and opinions on how a prevention campaign should be conducted in the future.

5. Main findings from interviews with authority figures, health and veterinary authorities

Overall, authority figures, (not including health staff), appear to have a relatively low knowledge of Avian Influenza. Medical personnel appear to be a bit more informed on the transmission modes, the ways to prevent an outbreak and the measures to undertake in case of emergency. However, teachers, mullahs and community leaders have vaguely heard about AI and feel concerned not to be better prepared, especially in remote areas with limited access to information and health.

AI affected areas appear to have a significantly higher degree of concern. This finding is verified by the findings of the quantitative questionnaire. However, other problems may have emerged as a result of greater awareness. Indeed, respondents affirm that people in their community have reduced or even stopped their consumption of eggs and chicken meat, foods that are important sources of protein. This is a major public health concern since many people in Afghanistan have no access to alternative sources of protein in their daily diet. It also endangers the livelihoods of farmers for whom the commercialization of chickens and eggs is an important source of income.

Level of concern

The provinces where people received the least information on Avian Influenza are obviously Kandahar, Herat, and Samangan, with many interviewees who have never heard about it in the past. The very volatile security situation in Kandahar province makes it particularly difficult for the government to intervene in order to inform the population about epidemiological risks.

Most of the informants from Kandahar province have never heard about Avian Influenza before. The population seems to have received very little information concerning this issue. In addition, many informants stated that they did not rely on information delivered by the government.

During the surveyors' visits at the Directorate of Health, they were told that all the IEC materials on AI were still in their stock. MOPH staff said they did not dare distributing the leaflets, for fear of creating a panic among the population. They thought health educators were needed to prevent people from taking measures that would later on endanger their nutritional status.

In addition, the Directorate of Health mentioned to our surveyors that they had no means to protect their area against an AI outbreak. Chicken were illegally imported from Pakistan without any control at the border. Because of the very insecure environment, the DOPH presented itself as incapable of setting up preventive measures.

Of the few informants who had heard about Avian Influenza on the radio, their economic condition did not allow them to take any preventive measures. Informants mentioned that AI was not an issue for them, since they had more urgent preoccupations, the one of surviving in times of conflicts.

“Nothing has been done to prevent this disease, because here people are killed by other people and everyone is afraid of that, not of virus or diseases.” Community leader, Rawanai village, Dand district, Kandahar province.

Generally, in provinces where no cases of AI were reported (Herat, Samangan, Kandahar), most interviewees appear not to worry much about the possibility of an outbreak in their village. A passive

behavior dominates that can probably be explained by the very limited knowledge of what could be done to prevent the disease and the risks it represents for human health.

“People so far do not know whether it is a dangerous illness or not, because they have not seen it yet”. Village leader, Bala-Deh village, Dand district, Kandahar.

Knowledge of the disease

In isolated regions, AI is understood as a result of poor hygiene and bad weather. It is mostly identified as a disease that is transmitted from poultry to human, and less as a disease that primarily affects birds.

“I think this happens because of dirty weather. Since the weather is very dusty and there are no protective measures taken, such kinds of diseases are common.” Mullah, Kandahar city.

Avian Influenza is also perceived as a disease coming from the “outside”, “a conspiracy of the enemy”. The importation of Pakistani chickens is often mentioned as a major risk factor.

“People are just careful about Pakistani chickens.” School principle, Khuram-e-Sarbagh village, Samangan province.

Misconceptions

In addition, Avian Influenza is assimilated to another bird disease more commonly known as “toghak” or chicken killer. Many respondents said the disease occurs once or twice a year and mentioned traditional treatments they used to cure their chickens.

“People do not know about Avian Influenza. If some chickens get this disease, people will think it is a common chicken disease and will not report it to the authorities.” Village leader, Behsood district, Nangahar.

Interviews with authority figures reveal a very partial level of knowledge among respondents, with an overemphasis on transmission from poultry to humans. The absence of veterinarians (many respondents stated they had never heard about these authorities) and the lack of medical personnel in remote areas create a favorable environment for rumors to circulate quickly. Future communication and information campaigns should therefore target this category of the population in priority in order to ensure that the appropriate messages are relayed among the general population.

6. Main findings from the KAP Questionnaire – Adults and recommendation for future IEC campaigns

Informants' profiles

A total of 304 people were interviewed, among which 46.8% were male. The mean age of our sample is 38.5, with informants ranging from age 15 to age 71. It is to be mentioned that due to some security problems in Herat province, only 32 people were interviewed in this province. 77.5% of the informants reported owning backyard poultry.

No correlation was found between respondent's sex and level of knowledge, even though 75% of the women interviewed had received no education. This is an interesting finding as it shows that uneducated people can learn and gather information through other means.

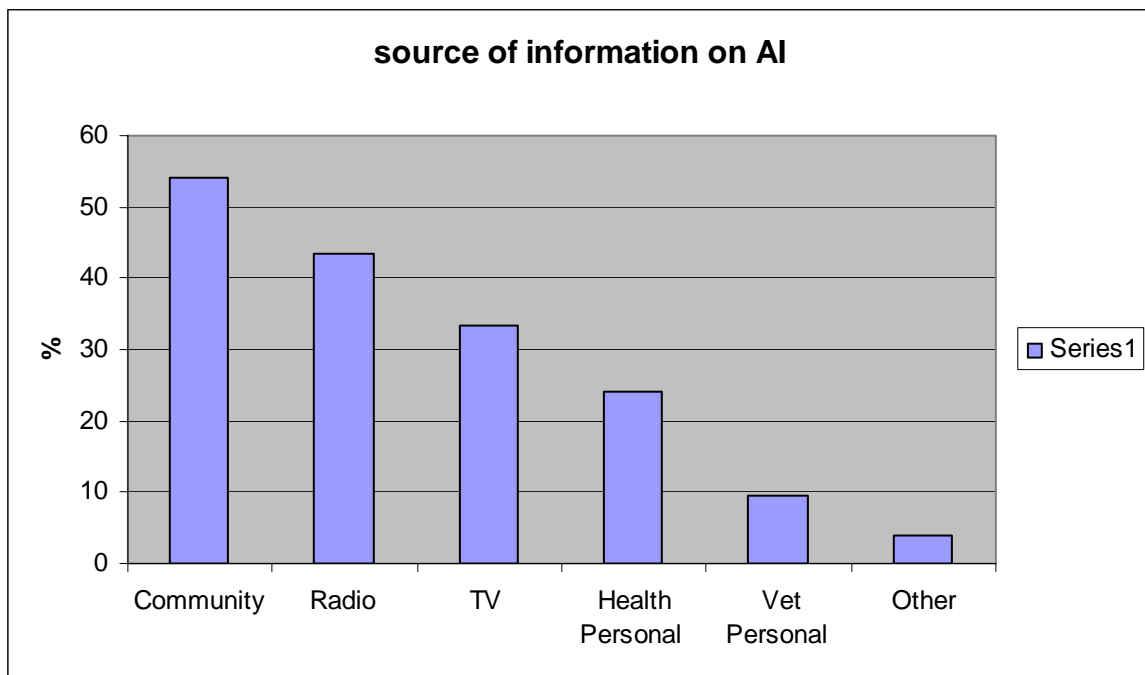
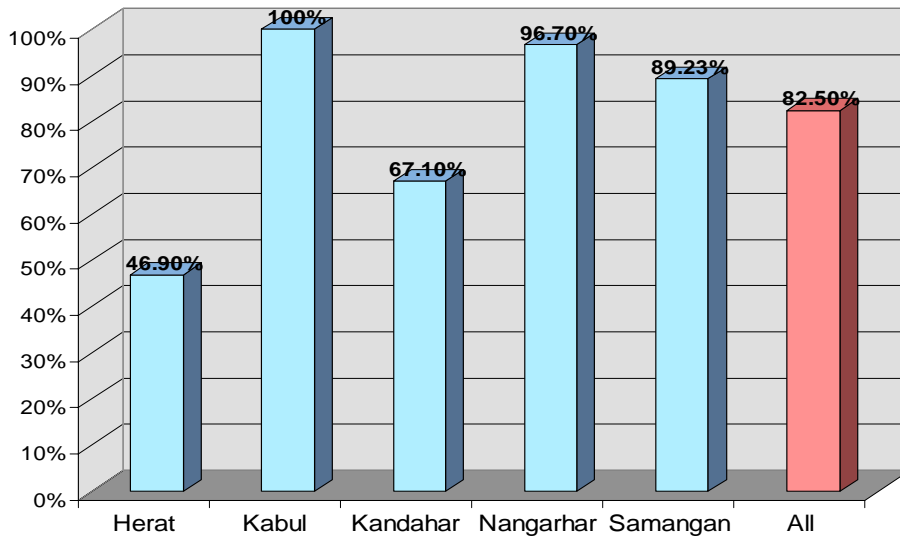
Total Number of Respondents	304	
Sex (% male)	46.8%	
Age – Mean (SD) [range]	38.5 (13.9) [15-71]	
Number (%) in each age group		
	<i>15-20</i>	30 (10)
	<i>21-30</i>	85 (28.2)
	<i>31-40</i>	64 (21.3)
	<i>>40</i>	122 (40.5)
Number (%) in each Province		
	<i>Herat</i>	32 (10.5)
	<i>Kabul</i>	64 (21.0)
	<i>Kandahar</i>	79 (26.0)
	<i>Nangahar</i>	64 (21.0)
	<i>Samangan</i>	65 (21.0)
Number (%) at each education level		
	Male	Female
	<i>None</i>	36 (26.1) / 117 (75)
	<i>Religious/Informal</i>	21 (15.2) / 12 (7.7)
	<i>Primary</i>	26 (18.8) / 13 (8.3)
	<i>Middle</i>	15 (10.9) / 5 (3.2)
	<i>High School</i>	32 (32.2) / 5 (3.2)
	<i>University</i>	8 (5.8) / 4 (2.6)
Number persons per room (crowding index)	2.5 (1.4) [0.6-12]	
Number (%) HH with child <5	239 (82.1)	
Number (%) without any electricity	134 (45)	

Knowledge of AI (Annex Table 3)

Kabul and Nangarhar are the two regions where we found the highest number of respondents who had heard about AI (100% in Kabul and 96.7% in Nangarhar) and who knew about its occurrence in Afghanistan (83.9 in Kabul and 90.6 in Nangarhar). These two provinces have been particularly exposed to IEC materials following AI outbreaks. Obviously these campaigns have achieved their objectives and have raised awareness among the population. The province where people were the least informed was Herat, with only 46.9% of respondents who had heard about this disease.

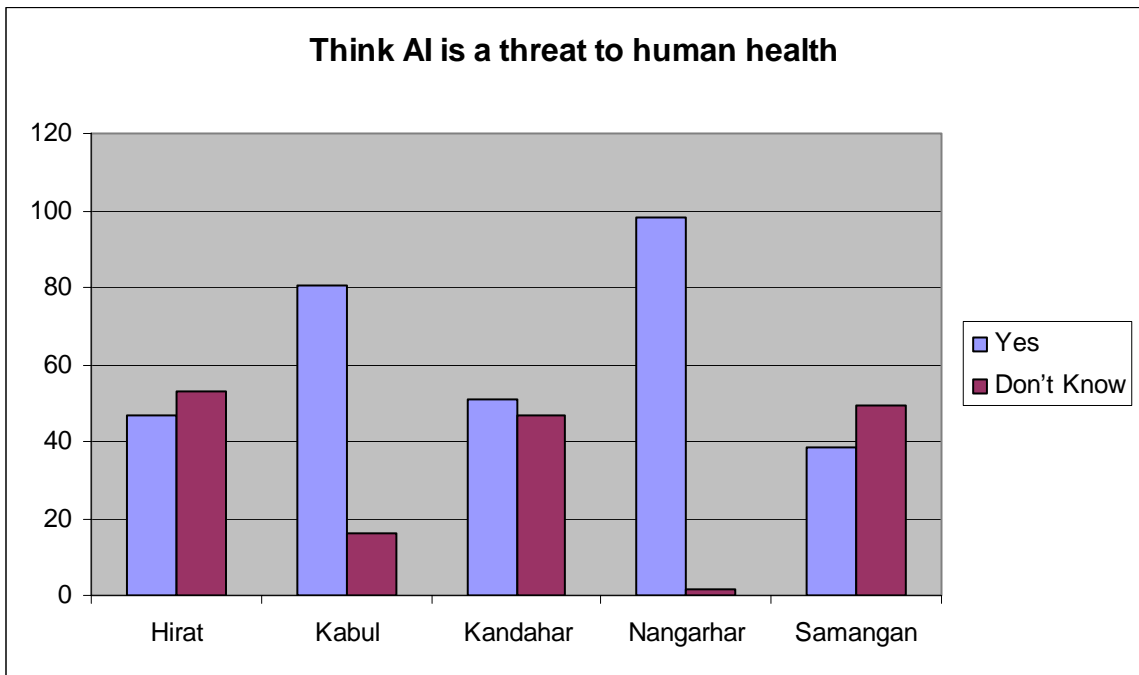
In most provinces, respondents had heard about AI mostly through the community. The community also represents the main and most trusted source of information among the poorest respondents. It is also to be noticed that in regions where the government has been able to intervene through IEC campaigns (Nangarhar and Kabul), the government is considered as a trusted source of information regarding AI. The MoPH should therefore intensify its communication campaigns in remote areas in order to increase people's trust in the future.

People who heard about Avian Influenza

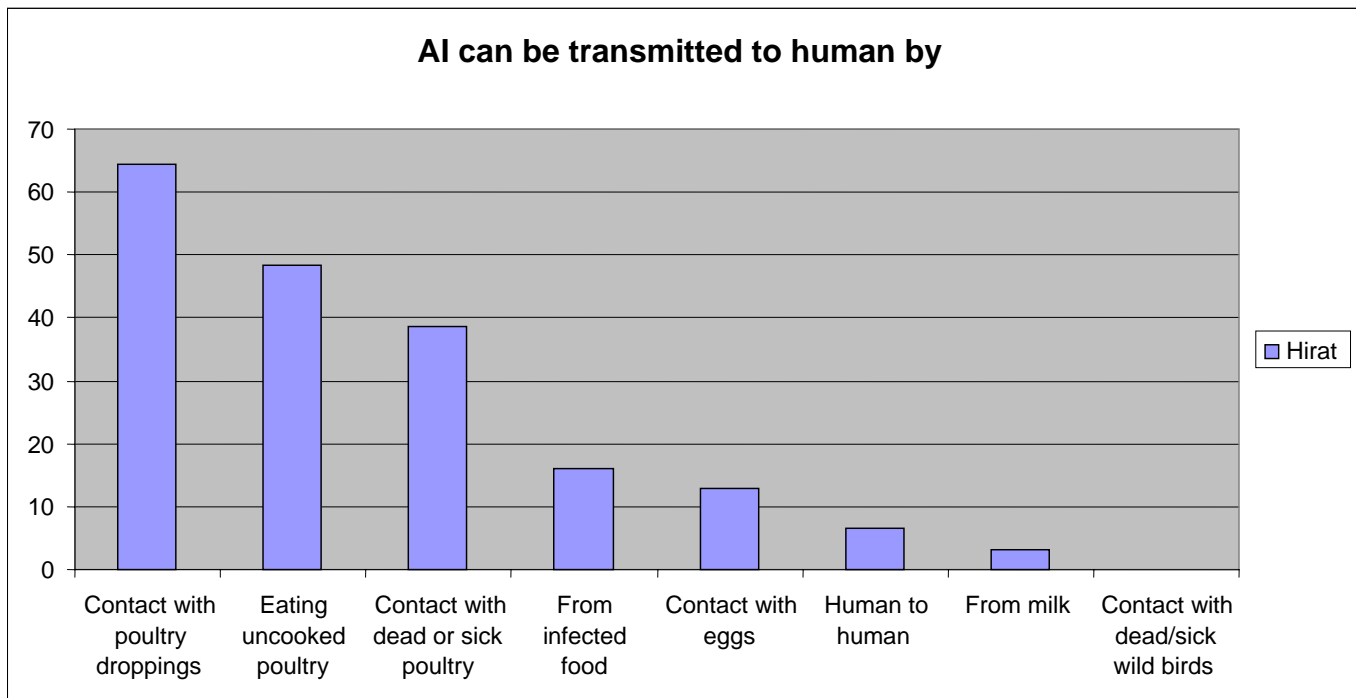


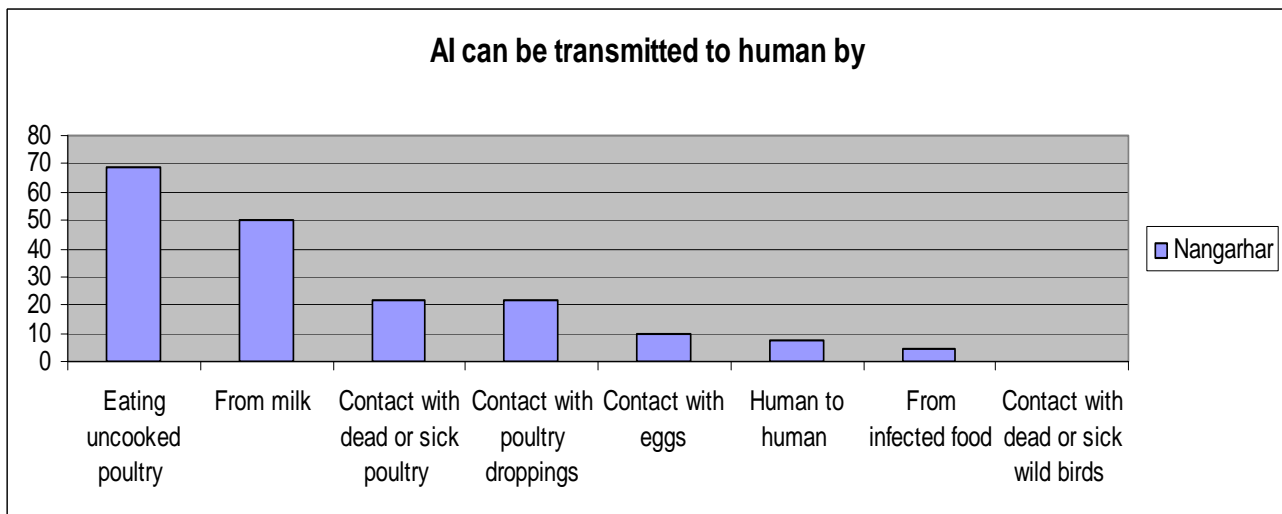
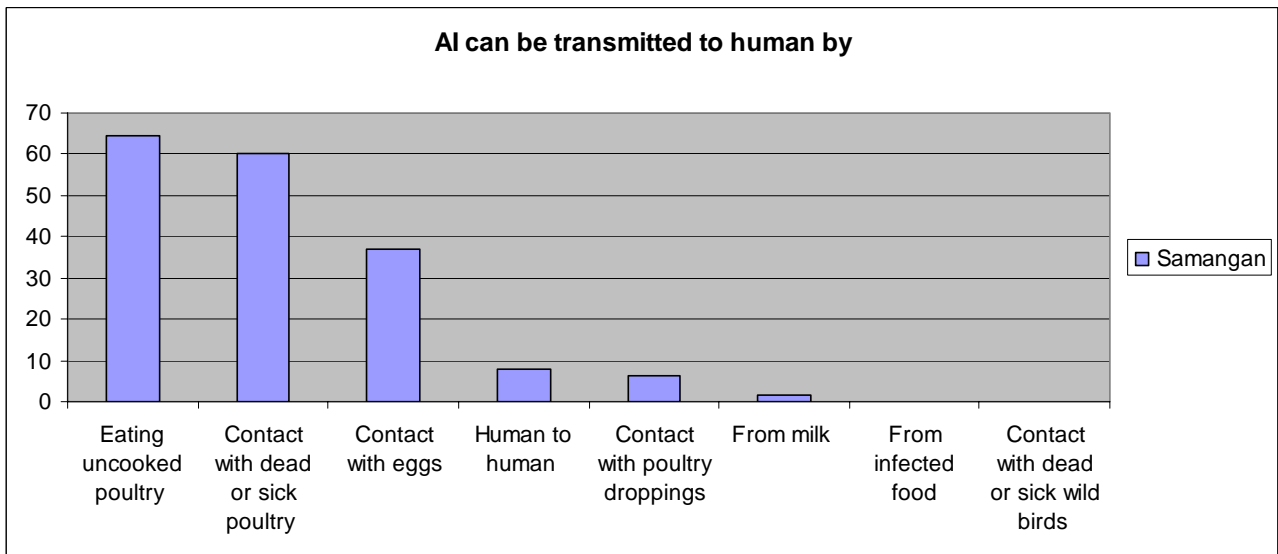
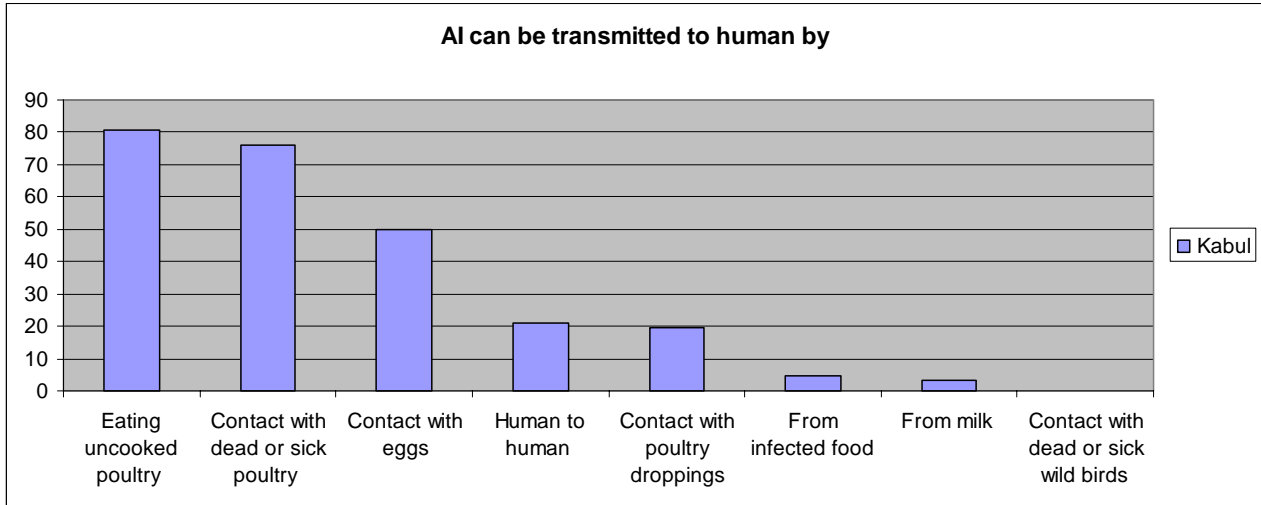
In addition, informants' socio-economic status had an influence on their level of concern. Informants with lower economic status hardly considered AI as a threat to human health, while the richest informants appeared to be much more concerned about it.

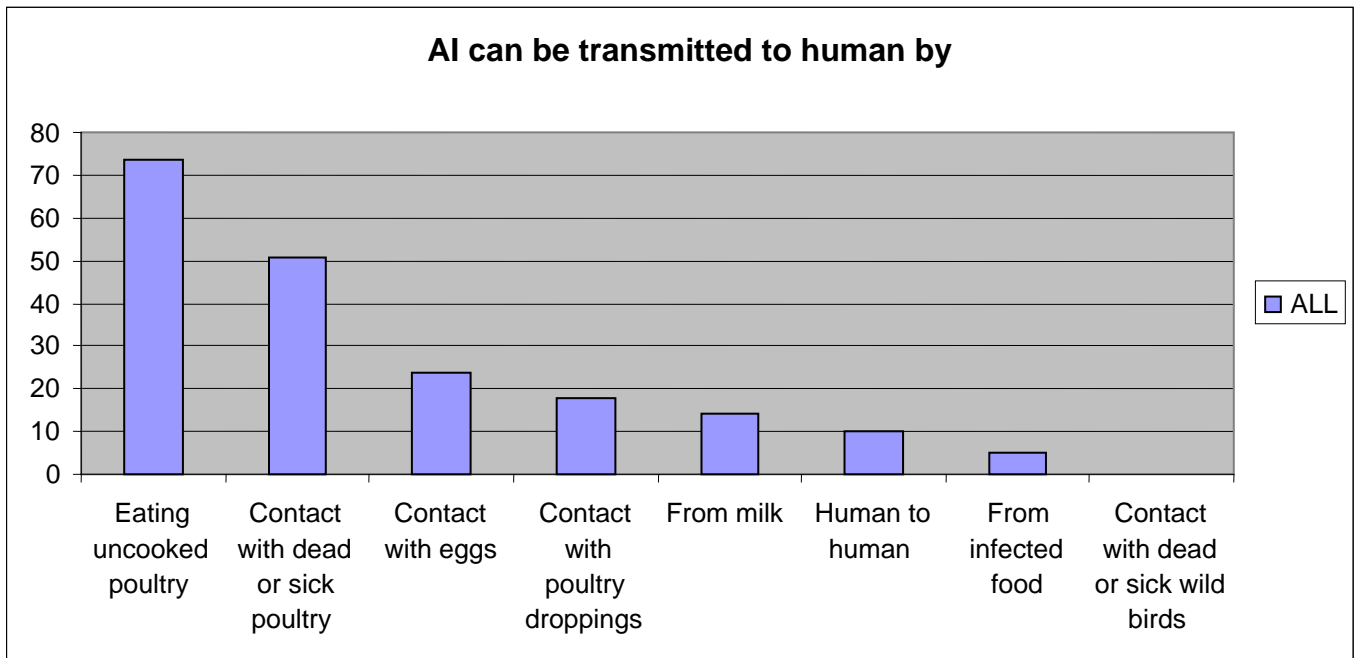
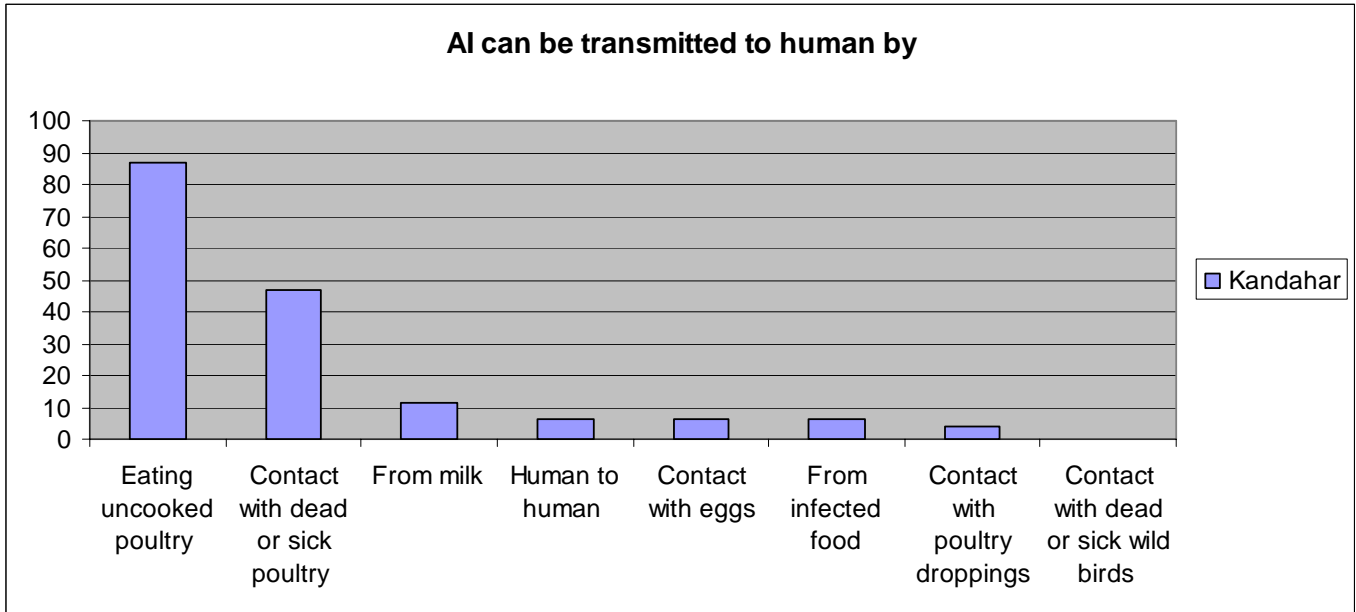
Perception of AI as a threat for human health



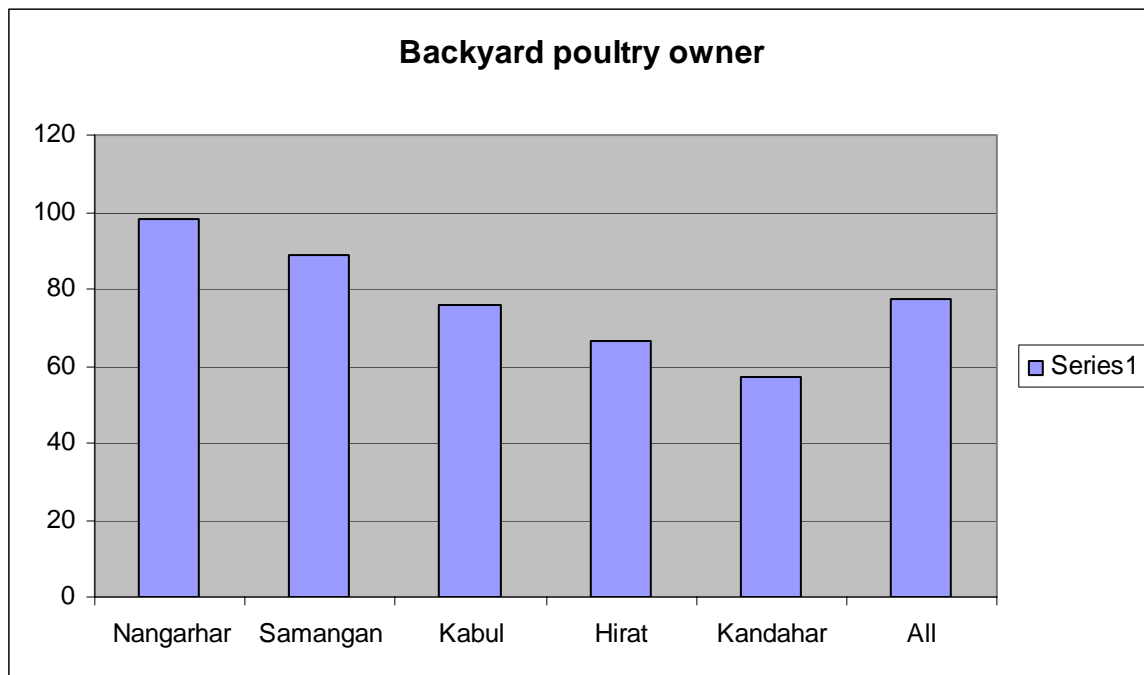
Knowledge of AI transmission modes







Poultry ownership



Informants with lower socio-economic status represent the category of the population that owns most chickens (85.5%). They are also the ones with the lowest knowledge scores. The IEC campaign should try to reach poorest segments of the population by using community networks.

In most provinces, respondents reported a lack of veterinarians, especially in Herat (75%) and Samangan (62.5%). In those two provinces, respondents have hardly heard about these services.

Poultry and other animal handling (Table 5)

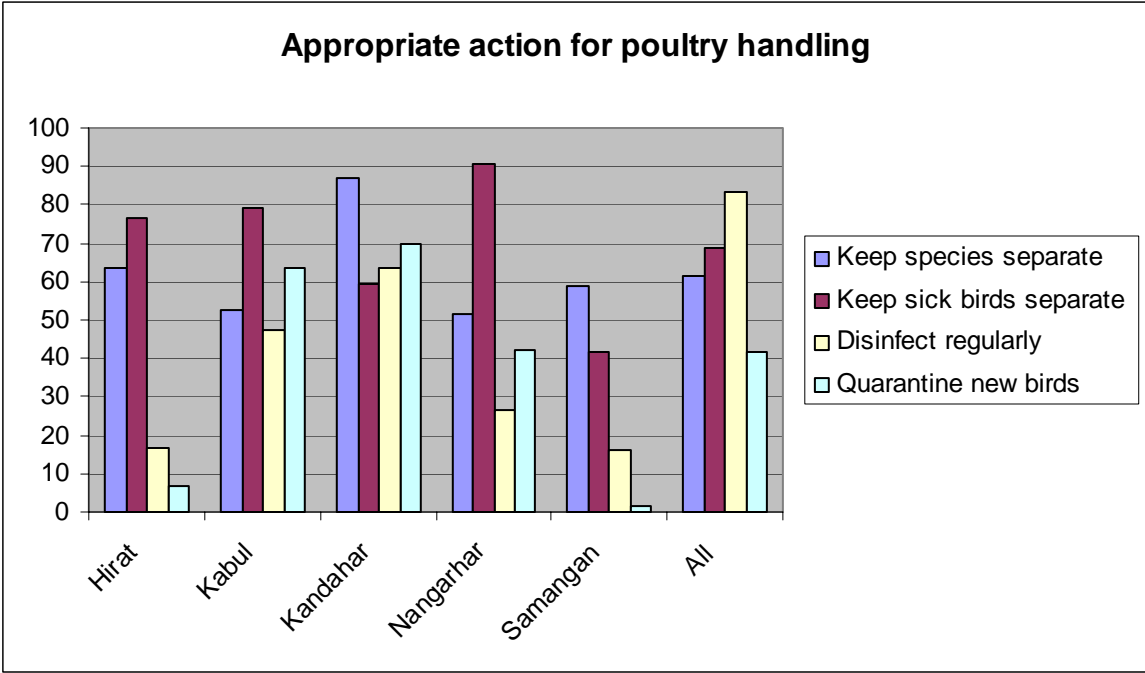
In general, informants from provinces that were exposed to AI reported better animal and poultry handling practices than informants from provinces not exposed to AI. Samangan has the highest level of chicken ownership (89.2%). However, Samangan has the highest proportion of people with the lowest knowledge scores. In suspected outbreaks, 87% of the informants from Samangan think they should sell all their sick birds and none of them think they should disinfect the place where infected birds have been kept. Herat has the second lowest knowledge mean score while 65.6 % of the informants reported owning chickens. The IEC campaign should therefore target these provinces in priority.

Poultry handling and attitudes dealing with AI suspected outbreak

The following four sections measure the prevalence of common practices relating to the prevention of AI among respondents. The first section, “separate”, addresses how safely respondents normally handle poultry (ie. Keeping species separate, quarantining new birds, etc.). The second section, “wash”, measures hygienic practices among respondents, both in general and specifically before and after handling poultry. The third section, “cook”, deals with how safely poultry is prepared by respondents for

consumption. Finally, the fourth section, “report”, includes questions that measure how likely respondents would be to report possible symptoms of an outbreak to authorities.

1- SEPARATE

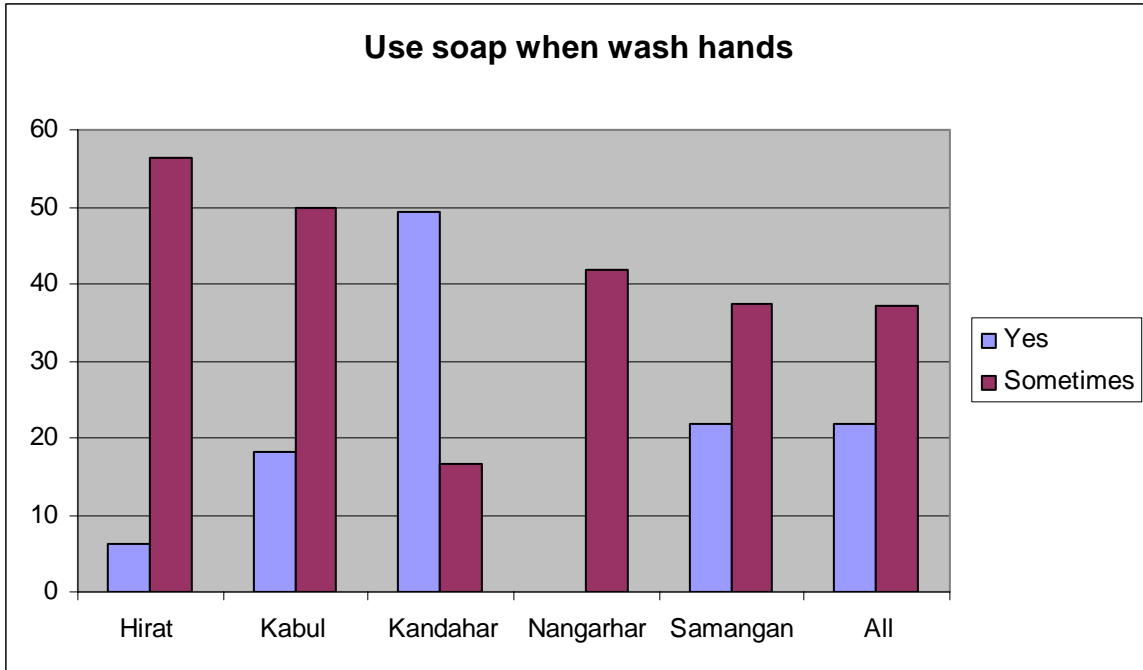


Generally, provinces with previous exposure to AI report better poultry handling practices overall, suggesting that the prior IEC campaign was at least somewhat successful in promoting such practices among the population. However, there are still some deficiencies in safe poultry handling practices among all areas, even those with previous exposure; in Nangarhar, for example, almost 90% of respondents reported that they would keep sick birds separate, but less than 30% reported that they disinfected poultry areas regularly. Future campaigns should take care to emphasize safe day-to-day practices as well as safe practices for dealing with possible symptoms of AI.

2- WASH

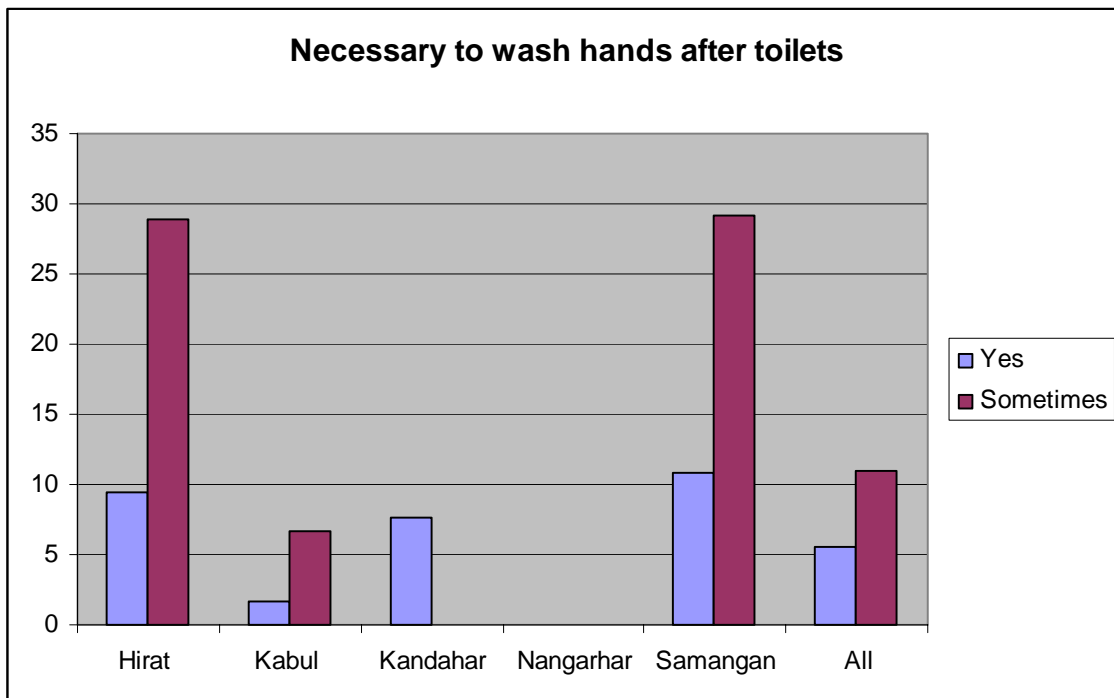
Hygiene attitudes and practices (Table 7)

The overall hygiene knowledge of respondents remains low, even in areas that have been exposed to AI. In Nangarhar, none of the respondents considered it necessary to wash their hands after using the latrines or after slaughtering animals. Respondents, across socio-economic groups, rarely use soap to wash their hands. Simple hygiene messages should therefore be developed during future communication campaigns. These messages should also suggest alternatives to soap when people cannot afford the purchase of this product.

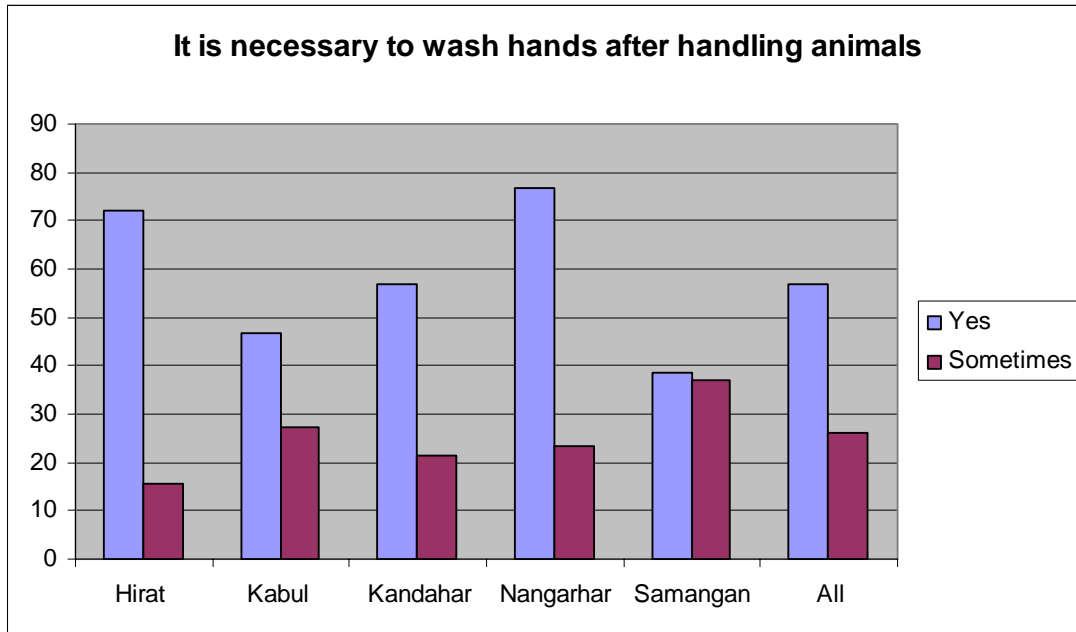


Use of soap when washing hands is overall very low. Disparities between provinces are great: in Nangarhar, none of the respondents reported a systematic use of soap (against 20 % in Kabul and Samangan 50% in Kandahar) but 50% reported an occasional use.

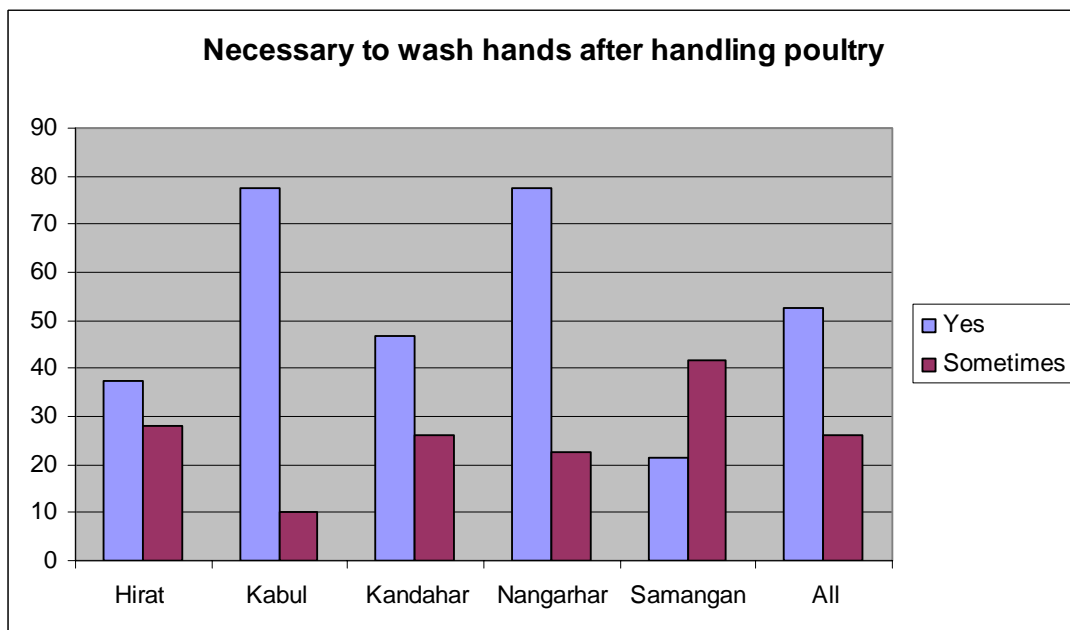
The divide between provinces exposed to AI and others cannot be found here, which could show that basic hygiene messages of the AI communication efforts were not as efficient as the AI specific messages were.

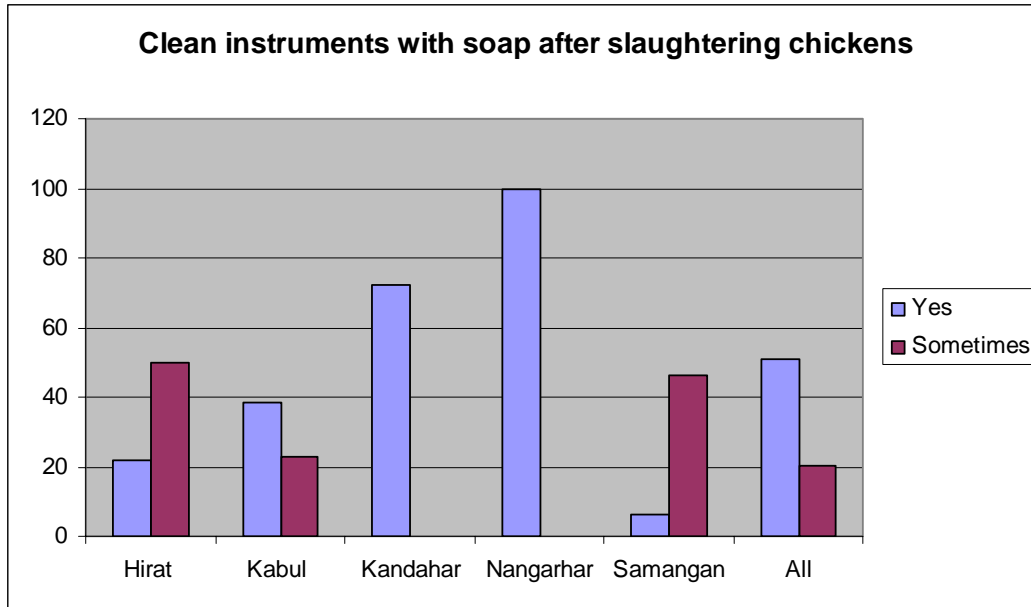


Generally speaking, very few people regard washing their hands after going to the toilets as necessary (5% always, 10% sometimes). Again no impact of the AI communication campaign can be detected as the two provinces with relatively higher scores are Herat and Samangan.



Awareness about the necessity to wash hands after handling animals is significantly higher (70% of all respondents). Nangarhar province has the highest scores, which may be a result of the AI communication messages.

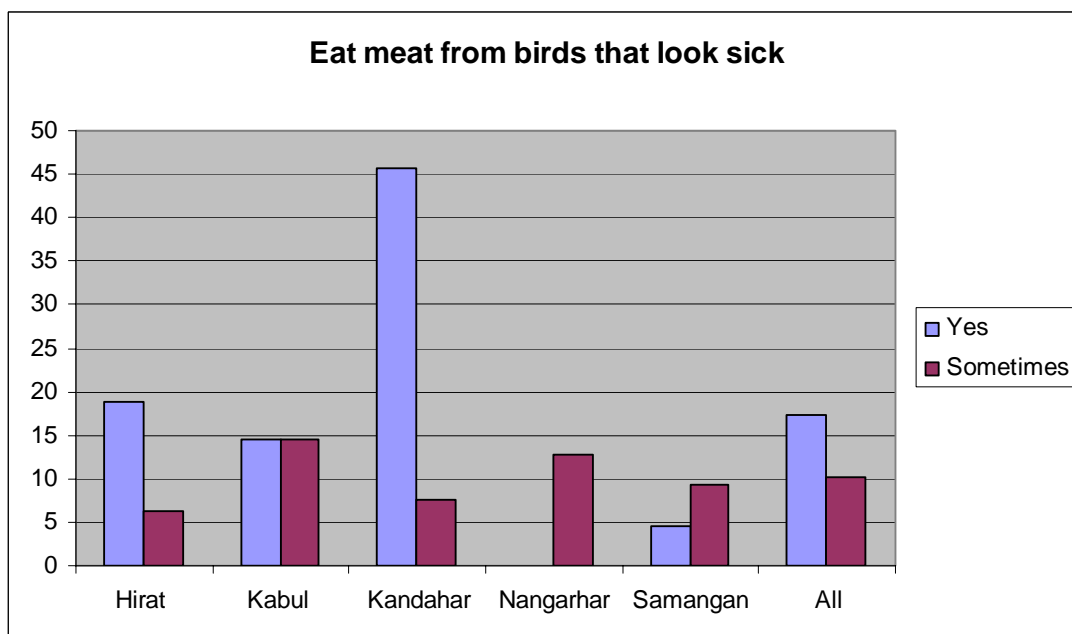


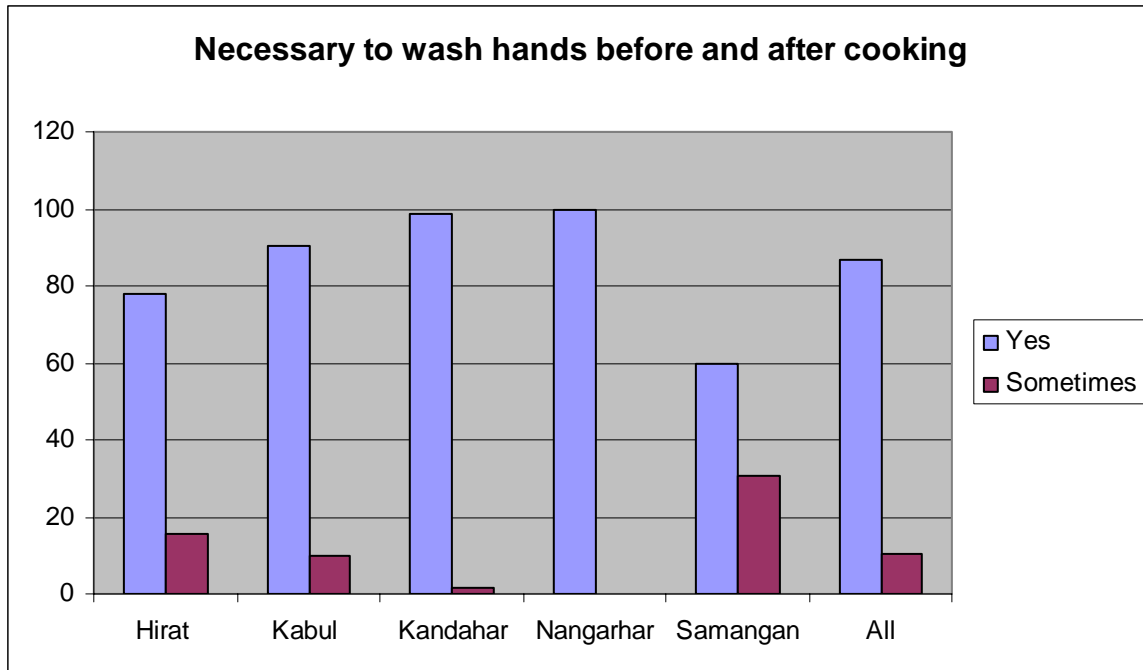


3- COOK

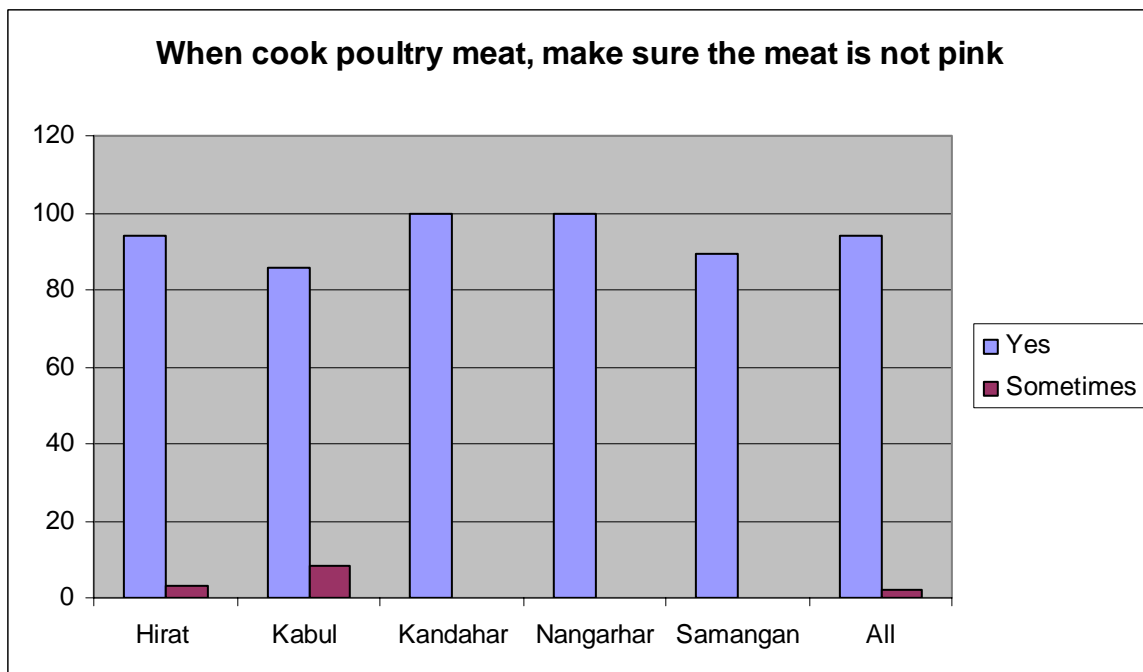
Cooking and food hygiene (Table 6)

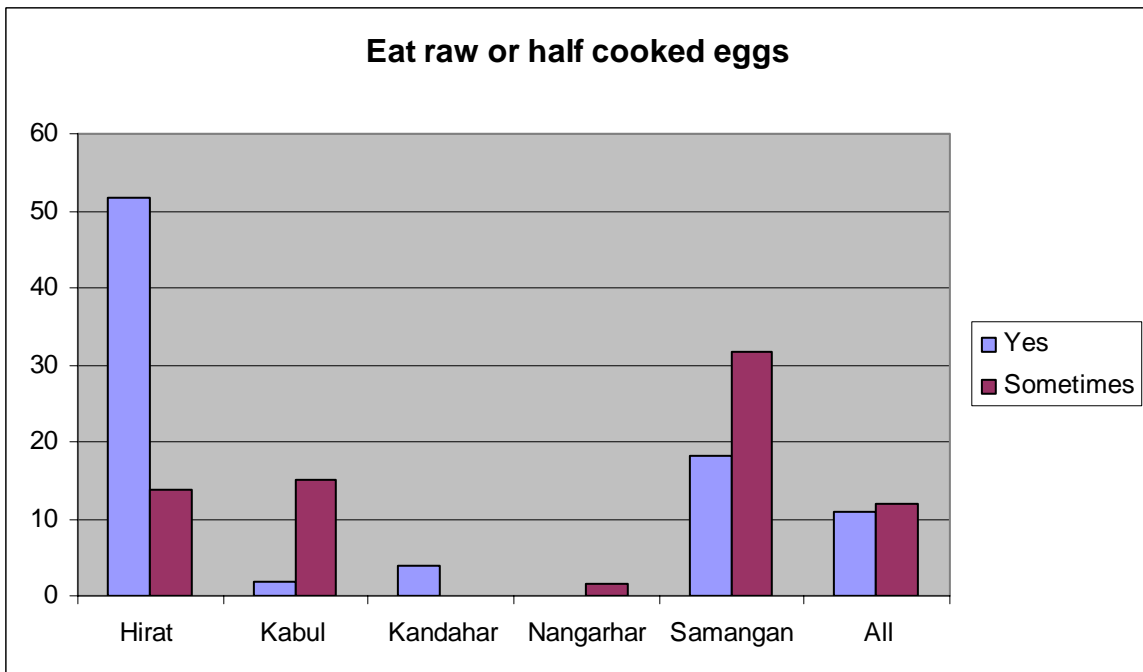
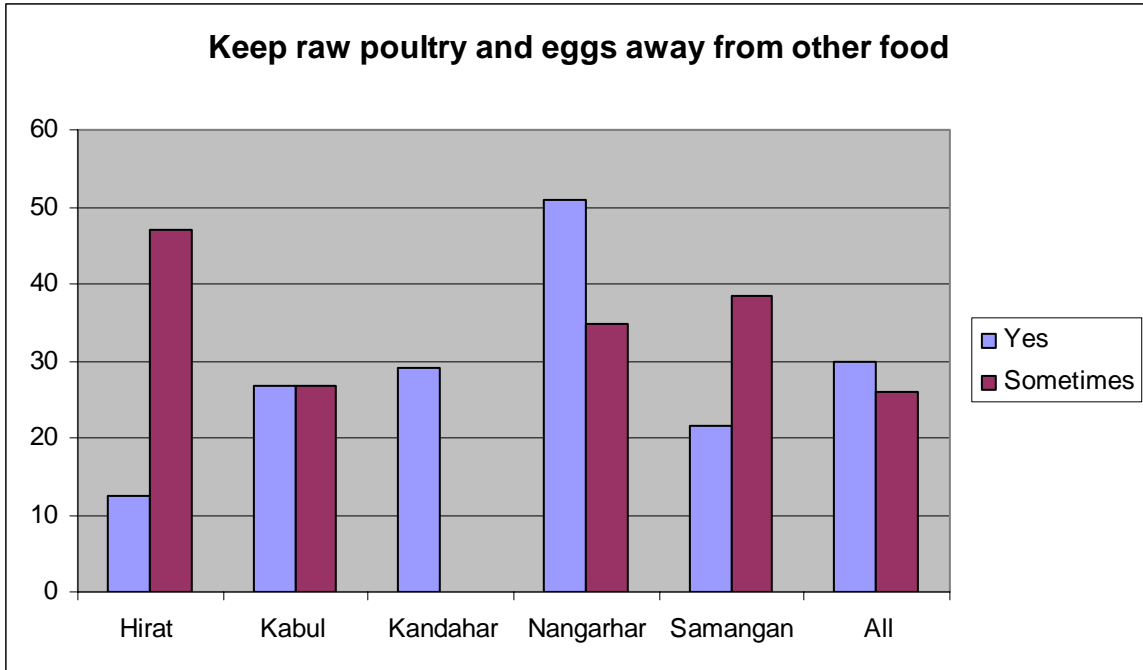
We notice the same correlation between informants' knowledge on cooking and food hygiene and their province of origin. In Kandahar, 45.6% of the respondents reported eating meat from birds that look sick even though this figure is moderated by the fact that 100% of them make sure that poultry meat is well cooked (not pink) when they eat it. Eating raw eggs remains a usual practice especially in Samangan. Food safety messages related to AI should be specific about which poultry products can be eaten and how to prepare them.



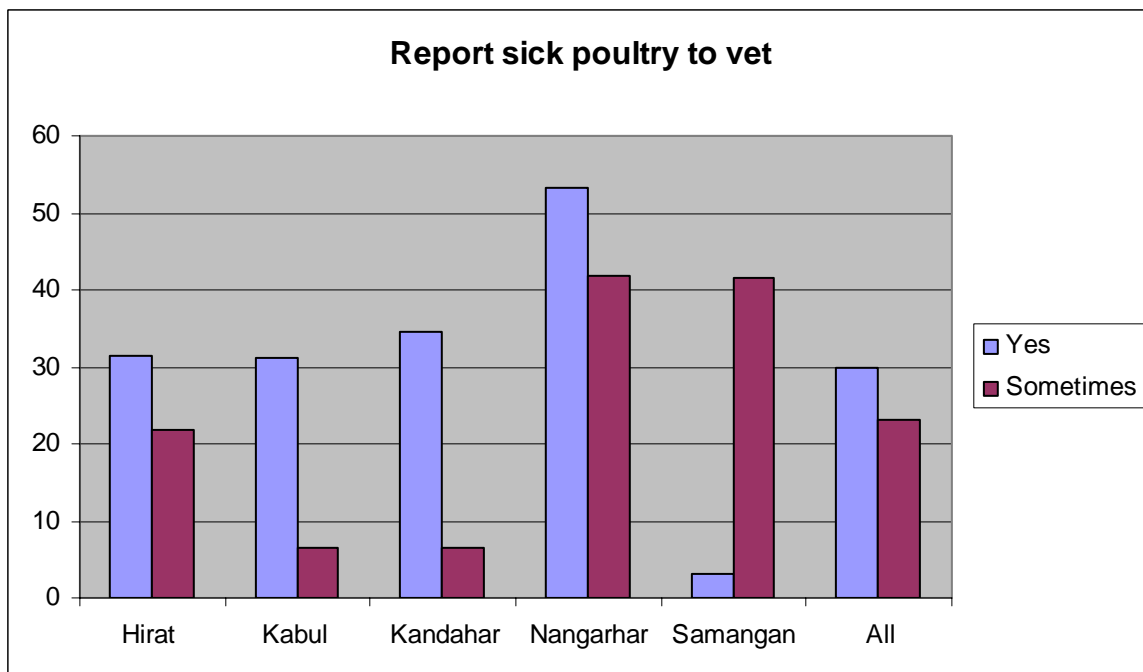
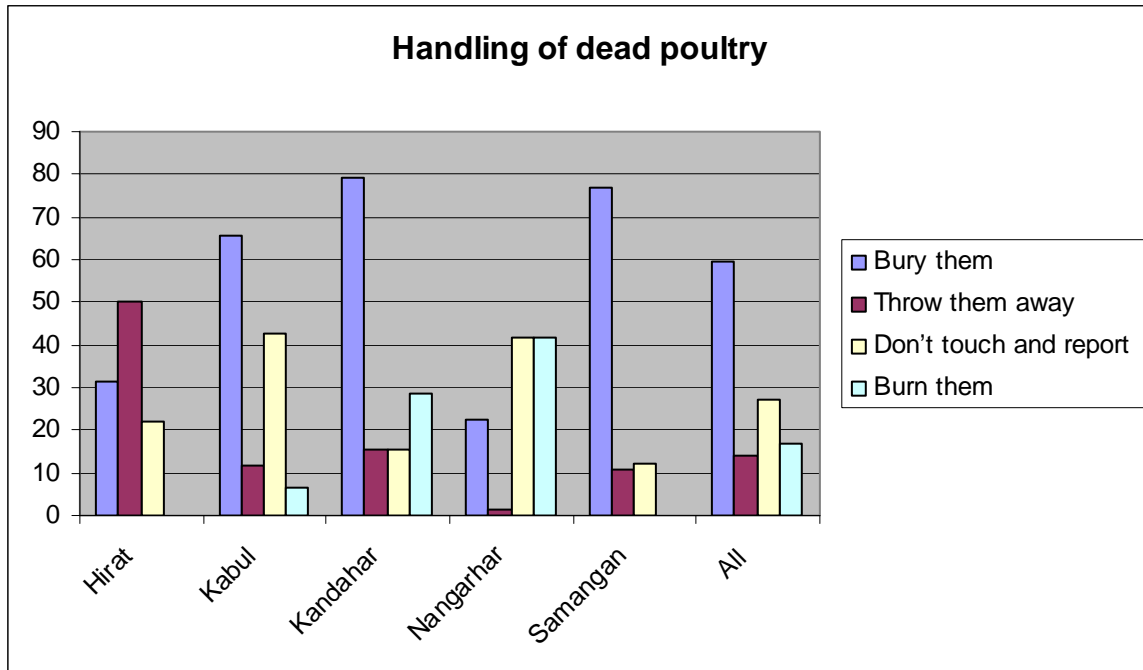


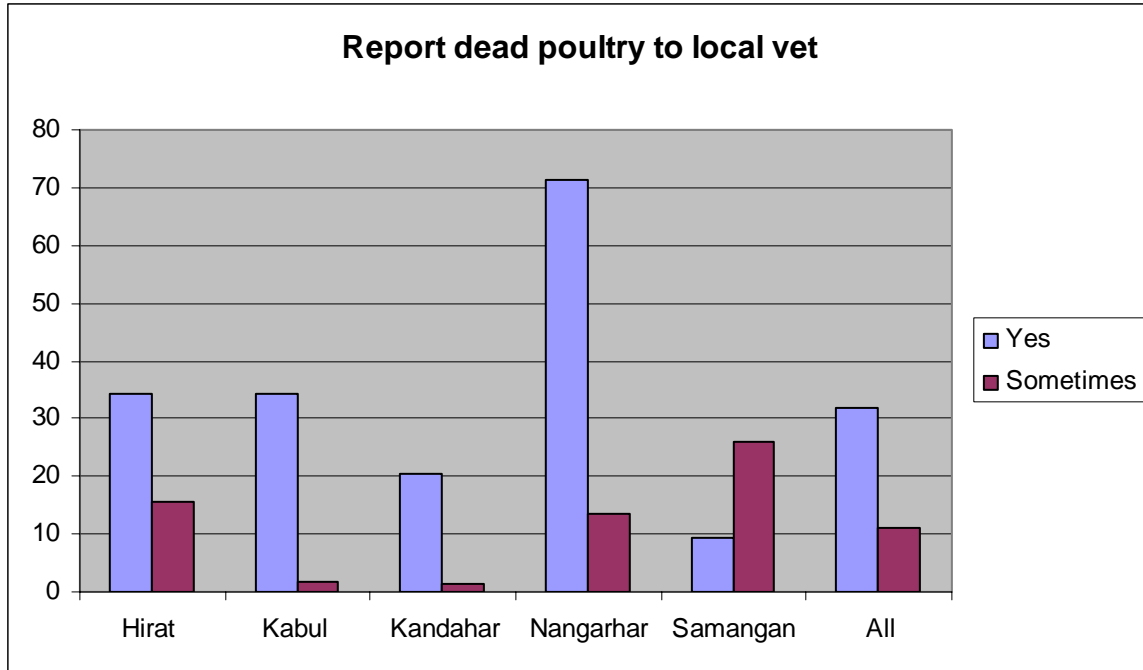
Knowledge of appropriate cooking and food hygiene is influenced by respondent's socio-economic status. Only 27.4% of respondents with low economic status reported cleaning instruments with soap after slaughtering chickens when 78.2% of respondents with higher socioeconomic status reported the same practice. The poorest segments of the population should therefore be informed in priority about the importance of proper cooking and food hygiene practices, even though the general population should also be sensitized. The use of community networks seems the most appropriate information channel to reach the most deprived segments of the population.





4. REPORT



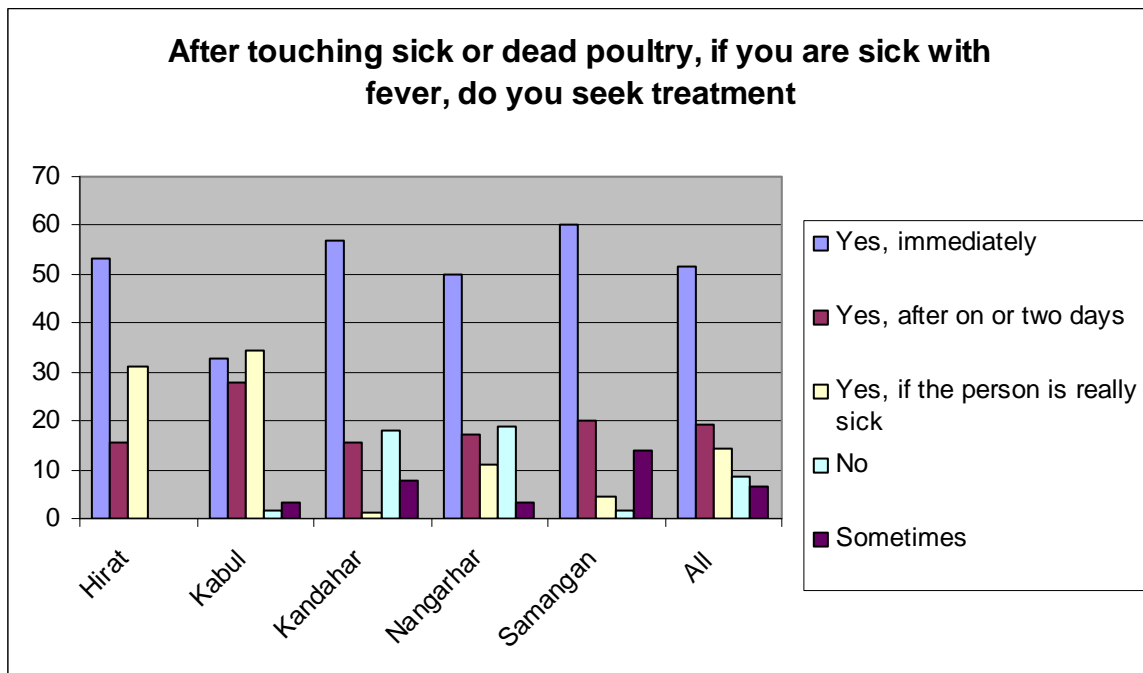
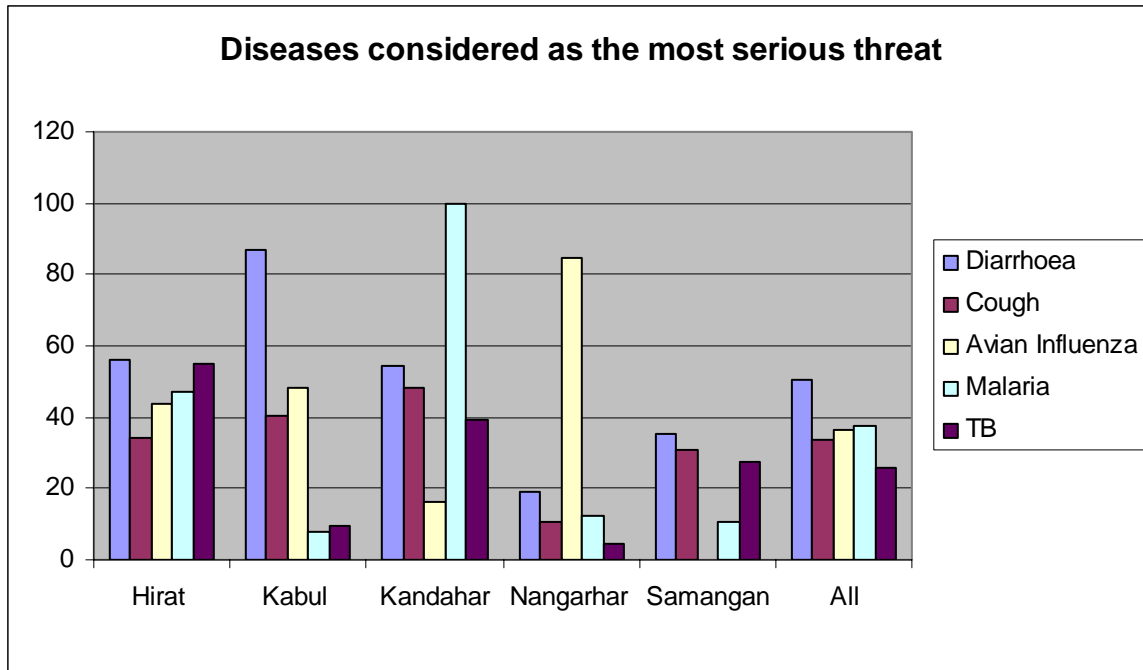


Human Influenza knowledge and treatment seeking behaviors (Table 11)

In most provinces, the disease that was considered as the most serious threat to human health was diarrhea. Malaria was reported as the most serious threat in Kandahar (100%), while diarrhea was reported as the top threat in Herat, Kabul and Samangan. Avian Influenza was considered as a serious threat in provinces which had been exposed to AI in the past. The level of concern towards the disease was also influenced by informants' socio-economic status, with higher level of concern among the richest segments of the population.

Practices such as eating uncooked poultry and contact with dead or sick birds were identified as risky, even though figures significantly varied from one region to another. In Nangarhar, 50% of respondents believed that AI could be transmitted to human from milk. Very few respondents considered contact with poultry droppings as dangerous. Human to human transmission was also disregarded. Only half of the informants considered contact with dead or sick poultry as an AI transmission mode. The campaign should put a greater emphasis on AI transmission modes.

Finally, the majority of informants (>50%) considered government and NGOs' clinics and hospitals as the most appropriate places to seek treatment, even though private doctors appeared as a second choice in most provinces.



Observations (Table 8)

In order to contrast informants' response with informants' actions and practices, surveyors conducted rapid direct observations in respondents' houses following their interviews. These observations revealed better practices in provinces that were exposed to AI in the past than in unexposed provinces.

In comparison to other Asian countries, poultry in Afghanistan tends to be kept outside of the house. However, respondents' limited access to clean water limits their possibilities to follow basic hygiene

principles. This is particularly true for Herat and Samangan, where respectively 25% and 18% of the households visited had access to clean water (closed well or pipe water). Informants' socio economic status also impacts on their ability to adopt proper poultry keeping practices such as keeping birds in cages and separating birds according to species. The communication campaign should offer realistic poultry keeping solutions for the most deprived segments of the population.

Further Analysis of KAP Scores.

Statistical Methods:

Based on the importance of each correct answer or opinion, a composite index score for knowledge and practice (knowledge scores) was calculated for each individual. The knowledge scores were scored out of a total of 177 points from 304 respondents (table X). These scores were then sorted in numerical order and divided into 4 equal parts (knowledge quartiles).

In order to discern independent associations, a logistic regression analysis was conducted¹. The outcome of interest was “good knowledge” – the top two quartiles. Factors potentially associated with knowledge were entered into the mathematical model. These were sex, age, provincial exposure to AI in the last 12 months, province, socioeconomic status, chicken ownership and ownership of backyard poultry.

Results:

Table X: Baseline Data:

Total number in analysis	304
Mean Knowledge Score	88.5 / 177 (50%)
Range	31-146
Mean scores by Quartile (%)	
Lowest Knowledge Level - 1	56.5 (31.9%)
2	78.3 (44.2%)
3	99.8 (56.4%)
Highest Knowledge Level - 4	122.8 (69.4%)

Proportion in each knowledge quartile were then analyzed by province, provincial exposure to AI in the last 12 months and socio-economic quartile (table X). There was a strong association between provincial exposure to AI and knowledge, with 7.9% of those in exposed provinces being in the lowest knowledge quartile versus 39.8% in provinces with no exposure (Table Y). This is a strong indication of the effectiveness of the intensive IEC campaigns. However, overall knowledge in provinces with no exposure to AI was generally low, demonstrating high variation in national knowledge.

¹ A logistic regression analysis is a statistical method which uses mathematical techniques to establish independent correlations between an “outcome of interest” (in this case knowledge, attitudes and practice towards AI) and multiple “risk factors” (in this case sex, age, socioeconomic status, province, poultry ownership, and ownership of back yard poultry). It is widely used in statistics to adjust for...

...confounding factors – which may be related to two (or more) of the “risk factors” – for example if we found that knowledge in Samangan is worse than Nangahar, it may simply be that Samangan is a poorer community than Nangarhar. Therefore province would give a false association to the outcome (knowledge), where in fact it is poverty which is the “true” risk factor, masked by the presence of more poor people in Samangan. The question answered by logistic regression analysis is which “risk factor” is independently responsible for the level of knowledge – province or socioeconomic status (regardless of the other).

Socioeconomic status was correlated with knowledge; those with high socio-economic status having highest knowledge. Despite being predominant owners of poultry (85.5% of the poorest vs. 36.4% of the least poor), the poorest were the least knowledgeable (table y/z).

Table Y: Number and proportion in each knowledge quartile, by province and SEQ.

	Quartiles of Knowledge Score			
	1 st	2 nd	3 rd	4 th
Number (%) in each Province*				
Herat	16 (50.0)	4 (12.5)	4 (12.5)	8 (25.0)
Kabul	6 (9.5)	12 (19.1)	26 (41.3)	19 (30.2)
Kandahar	15 (19.0)	24 (30.4)	17 (21.5)	23 (29.1)
Nangahar	4 (6.3)	13 (20.3)	28 (43.8)	19 (29.7)
Samangan	39 (60.0)	20 (30.8)	5 (7.7)	1 (1.5)
Provinces Exposed to AI in 2007*				
Yes	10 (7.9)	25 (19.7)	54 (42.5)	38 (29.9)
No	70 (39.8)	48 (27.3)	26 (14.8)	32 (18.2)
Number () in each SEQ*				
Poorest – 1	40 (64.5)	9 (14.5)	5 (8.1)	8 (12.9)
2	18 (30.5)	15 (25.4)	14 (23.7)	12 (20.3)
3	7 (12.3)	16 (28.1)	18 (31.5)	16 (28.1)
4	10 (15.9)	21 (33.3)	20 (31.8)	12 (19.1)
Least poor – 5	3 (5.5)	10 (18.2)	20 (36.6)	22 (40.0)

* Chi² p<0.001

Table z: Mean Scores by province, previous AI exposure and SEQ.

	Mean	(mean / 177)
Province*		
Herat	76.8	43.4
Kabul	99.3	56.1
Kandahar	92.2	52.1
Nangahar	99.6	56.3
Samangan	68.4	38.6
Province Exposed to AI in 2007**		
Yes	99.5	56.2
No	80.6	45.5
SEQ*		
Poorest – 1	70.9	40.1
2	85.2	48.1
3	95.7	54.1
4	89.6	50.6
Least poor – 5	104.3	58.9

* oneway anova test: p<0.001

** students t-test: p<0.001

On logistic regression analysis, odds ratios were calculated. The most striking finding of this analysis is the effect of socioeconomic status on knowledge, independently of all other factors (such as where they

live, their sex, and the provinces exposure to AI) (table z). Those in the highest socioeconomic group are ~30 times more likely to have “good knowledge” of AI than the poorest, independently of whether their province has been affected by AI. This provides strong evidence that the messages given during IEC campaigns have a lesser effect on the poorest groups (who are also more likely to own poultry). The accessibility of the information (in radio, TV and print media) to the poorest is likely to be the predominant factor, since gender was unrelated to knowledge score whilst 75% of females are uneducated. Since the poor predominantly use social or community networks for their information, targeting of community and religious leaders with the correct information in addition to measures aimed at specifically targeting the poorest members of communities is a strong recommendation.

Table Z:

	Unadjusted Analysis			Adjusted Analysis		
	OR	95 CI	P	OR	95 CI	p
Province Exposed						
No	1	-	-	1	-	-
Yes	7.7	(3.8-15.8)	<0.001	14.7	(6.1-35.6)	<0.001
SEQ						
Poorest - 1	1	-	-	1	-	-
2	4.1	(1.9-8.9)	<0.001	2.5	(1.0-6.1)	0.054
3	13.0	(5.0-33.5)	<0.001	14.0	(4.6-42.4)	<0.001
4	9.6	(4.1-22.6)	<0.001	8.1	(3.1-21.7)	<0.001
Least Poor - 5	31.5	(8.8-112.8)	<0.001	37.5	(9.7-145.2)	<0.001
Has Backyard Poultry						
No	1	-	-	1	-	-
Yes	0.5	(0.2-1.0)	<0.001	0.4	(0.2-1.1)	0.066

The effectiveness of IEC campaigns conducted to date, and the level of concern generated by proximity to an AI outbreak (and the community, media and government response) are the likely reason why knowledge is better in provinces which have been exposed to the disease. An additional reason is the accessibility of these provinces and the relatively better developed health (and general) infrastructure. This provides evidence that intensive IEC campaigns in the presence of AI outbreaks improves the knowledge, attitudes and practices of their inhabitants. This implies that from the health education stand point, as well as in terms of pure outbreak control, adequate disease surveillance amongst veterinary and health staff coupled with rapid response to outbreaks is a vital component in reducing public exposure and in increasing trust in the government.

Intensive IEC campaigns can therefore be considered a worthwhile intervention in response to H5N1 AI outbreaks in poultry, and may contribute to the prevention of human cases.

Summary of findings

- KAP Scores relation to sex: There was no significant difference between male and female KAP but more males had heard about AI.

Sex	Mean KAP score (%/177)	% Heard of AI
Male	91.2 (51.5)	93.1
Female	85.3 (48.2)	73.6

- KAP scores relation to age group: We found no significant difference in KAP score or knowledge of AI between age groups, but slightly higher in lower age group.

Age group	Mean KAP score	% Heard of AI
15-20	94.4	83.3
21-30	90.5	84.3
31-40	90.2	85.7
>40	84.9	79.3

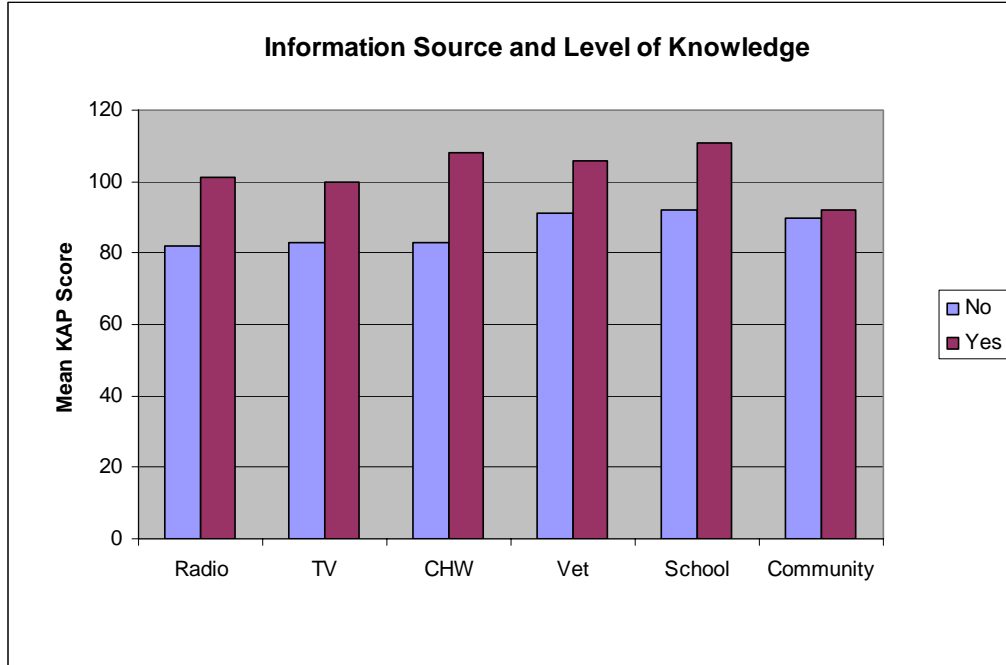
- KAP score relation to economic status: Strong correlation between SES and KAP score. No significant difference between % heard of AI and SES.

Socio Economic Status	Mean KAP score (%/177)	% heard of AI
Poorest	70.9 (40.1)	72.1
Least poor	104.3 (58.9)	85.5

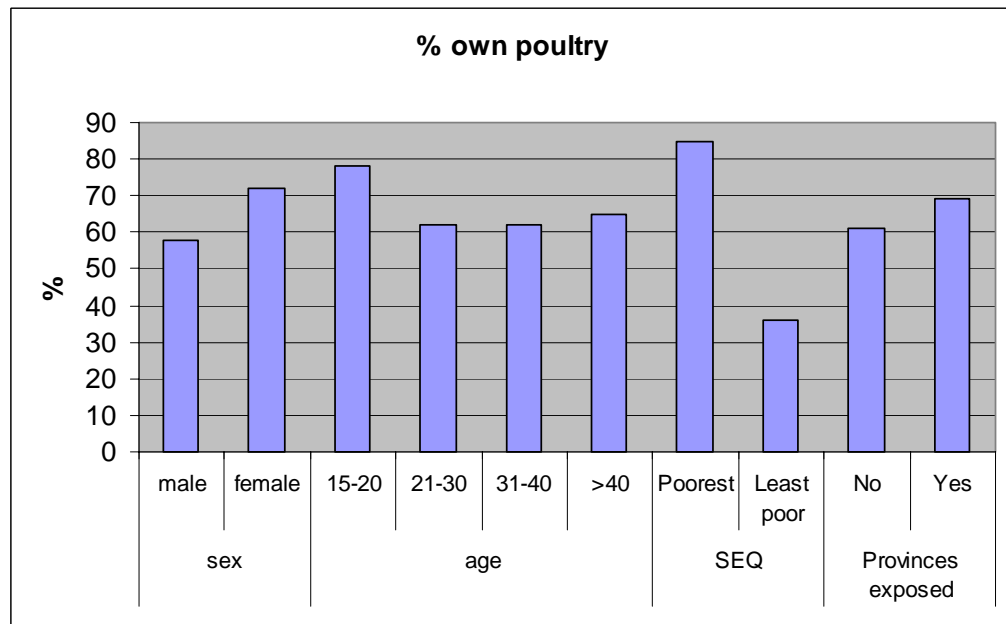
- KAP scores relation to provincial exposure to AI in 2006/2007: Provinces exposed to AI had higher KAP scores and have heard of AI more frequently than provinces not exposed.

Provinces exposed?	Mean KAP score (%/177)	% Heard of AI
Yes	80.6 (45.5)	71.7
No	99.5 (56.2)	98.3

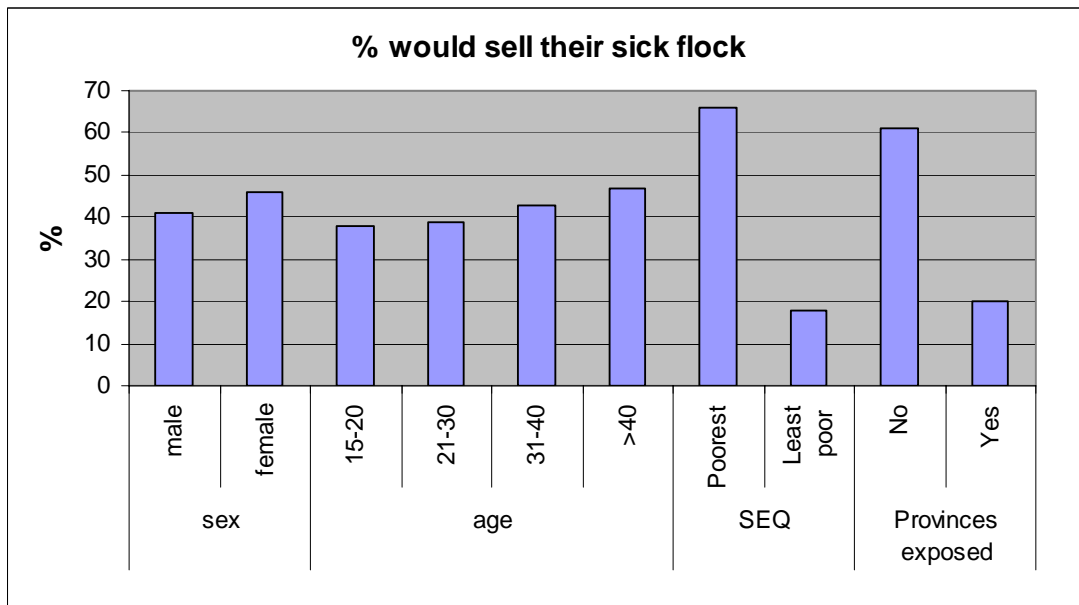
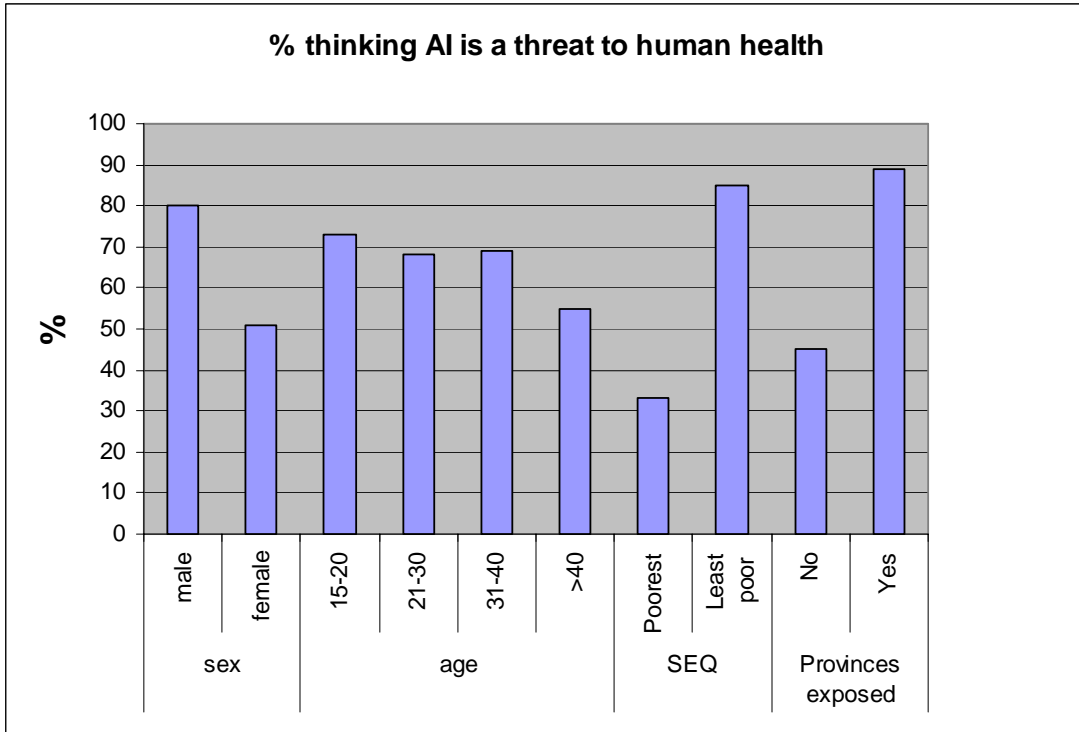
- KAP score relation to information source: It is to be mentioned that the community remains the main source of information among the poorest segments of the population.

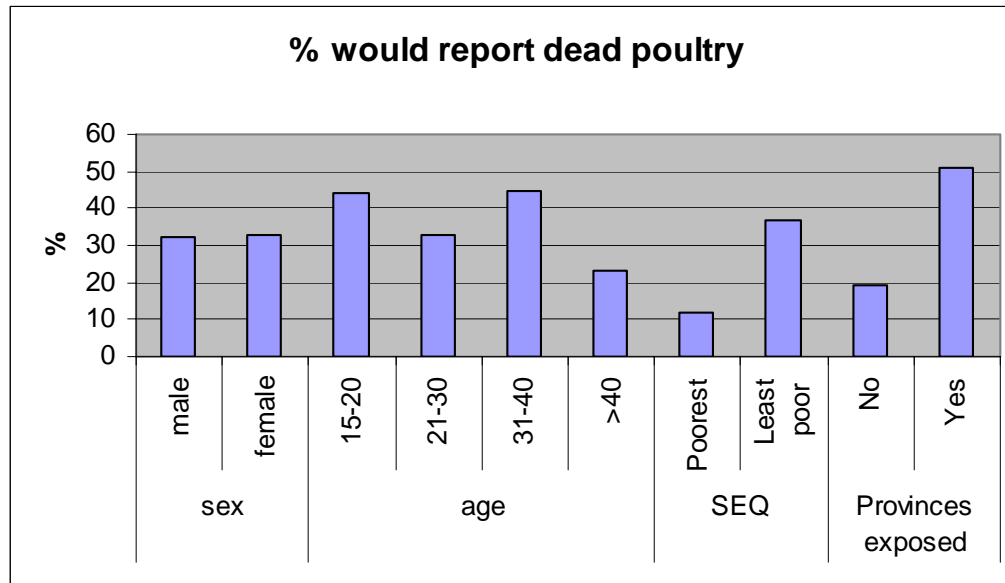


- Demographic factors associated with poultry ownership: The poorest segments of the population are the ones that own most poultry. Therefore, they are the one that are the most exposed to risk.



- Relationship between demographic factors and specific behaviors and attitudes: AI is not a major concern among the poorest. Exposed provinces present a higher level of concern.





7. Main findings from the KAP questionnaire – children and recommendations for future IEC campaigns

Results from the KAP with children were not sorted by provinces and socio-economic variables, as our sample was too small (100 children) to highlight significant differences in knowledge between respondents from different provinces, economic background and sex. However, what appears clearly is that children’s knowledge on AI remains quite low and very few of them have received basic information about it. Indeed, 49% of children have never heard about AI in poultry in Afghanistan.

Concern about the infection

This lack of awareness is probably the underlying reason for their lack of concern. 77.8% of children do not expect any cases of AI in their area and 65% state they don’t fear to be affected by AI in the future.

Knowledge about AI

Most children do not seem to be aware of basic biosecurity measures in case of AI outbreak. Only 25.2% of children report washing their hands after touching poultry, 35.3% do not wash hands before and after eating and only 45.4% report sick/dead birds to adults.

Teachers remain the most trusted source of information for children, together with health personnel. These networks should be used in order to sensitize children during future IEC campaigns and ensure they are provided with essential prevention messages.

Tolo TV and Ariana are their 2 favorite TV channels and cartoons are by far their favorite TV programme.

8. Conclusion and Recommendations

Most people have heard about Avian Influenza. Those who own poultry (mostly backyard) are the lowest Socio Economic Status in the community. There are important differences in KAP between socio-economic groups and between exposed and unexposed provinces. However, sex and age have little impact on informant's KAP.

Recommendations:

- Rapid-response intensive IEC campaigns immediately following HPAI poultry outbreaks should be enhanced and expanded.
- Low intensity IEC campaigns with key messages should be conducted in all provinces, and as a refresher in exposed provinces.
- Special attention should be paid to lower-economic groups, most effectively through enhancing access to accurate knowledge through community sources.
- Strengthen the knowledge of community leaders to ensure accurate information is passed to communities.
- Children are good at transferring knowledge and should therefore be targeted as a priority.

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ANNEXES

Table 1: Cohort Data – Adult KAP:

Total Number of Respondents	304	
Sex (% male)	46.8%	
Age – Mean (SD) [range]	38.5 (13.9) [15-71]	
Number (%) in each age group		
	<i>15-20</i>	30 (10)
	<i>21-30</i>	85 (28.2)
	<i>31-40</i>	64 (21.3)
	<i>>40</i>	122 (40.5)
Number (%) in each Province		
	<i>Herat</i>	32 (10.5)
	<i>Kabul</i>	64 (21.0)
	<i>Kandahar</i>	79 (26.0)
	<i>Nangahar</i>	64 (21.0)
	<i>Samangan</i>	65 (21.0)
Number (%) at each education level		
	Male	Female
	<i>None</i>	36 (26.1)
	<i>Religious/Informal</i>	117 (75)
	<i>Primary</i>	12 (7.7)
	<i>Middle</i>	26 (18.8)
	<i>High School</i>	13 (8.3)
	<i>University</i>	15 (10.9)
		5 (3.2)
		32 (32.2)
		5 (3.2)
		8 (5.8)
		4 (2.6)
Number persons per room (crowding index)	2.5 (1.4) [0.6-12]	
Number (%) HH with child <5	239 (82.1)	
Number (%) without any electricity	134 (45)	

Table 2: Principle Components Analysis

	Poorest				Least Poor	
	1	2	3	4	5	
Household Employment						
	<i>None</i>	5 (8.1)	4 (6.8)	4 (7.0)	0	2 (3.6)
	<i>Farmer</i>	32 (51.6)	30 (50.9)	16 (28.1)	21 (33.3)	5 (9.1)
	<i>Labourer</i>	12 (19.4)	7 (11.9)	4 (7.0)	3 (4.8)	1 (1.8)
	<i>Shop/Market</i>	5 (8.1)	6 (10.2)	12 (21.1)	9 (14.3)	18 (32.7)
	<i>Driver</i>	7 (11.3)	5 (8.5)	4 (7)	10 (15.9)	4 (7.3)
	<i>Office</i>	0	6 (10.2)	14 (24.6)	10 (15.9)	16 (29.1)
	<i>Other</i>	1 (1.6)	1 (1.7)	3 (5.3)	10 (15.9)	9 (16.4)
Crowding Index (mean)	2.8	3.0	2.7	2.4	1.8	
No Electricity n (%)	35 (58.3)	30 (53.6)	30 (52.6)	24 (38.1)	13 (23.6)	
Household Assets						
	<i>Bicycle</i>	7 (11.3)	38 (64.4)	43 (75.4)	41 (65.1)	35 (63.6)
	<i>Car/Truck</i>	2(3.2)	7 (11.9)	16 (28.1)	23 (36.5)	39 (70.9)
	<i>Cassette Player</i>	15 (24.2)	35 (59.3)	37 (64.9)	49 (77.8)	48 (87.3)
	<i>Rug</i>	56 (90.3)	54 (91.5)	50 (87.7)	53 (84.1)	53 (96.4)
	<i>Pressure Cooker</i>	62 (100)	54 (91.5)	45 (79.0)	20 (31.8)	2 (3.6)

Table 3: Knowledge of AI, by Province:

	Herat	Kabul	Kandahar	Nangahar	Samangan
Number (%) heard of AI*	15 (46.9)	60 (100)	51 (67.1)	58 (96.7)	58 (89.23)
Where Heard of AI					
<i>Radio*</i>	1 (5.9)	26 (41.9)	40 (74.1)	33 (55.0)	7 (11.7)
<i>TV*</i>	8 (47.1)	24 (38.7)	24 (44.4)	11 (18.3)	17 (28.3)
<i>Health Personnel*</i>	7 (41.2)	27 (43.6)	12 (22.2)	1 (1.7)	14 (23.3)
<i>Vet Personnel*</i>	1 (5.9)	5 (8.1)	11 (20.4)	1 (1.7)	6 (10.0)
<i>Schools*</i>	2 (11.8)	8 (12.9)	8 (14.8)	0	2 (3.3)
<i>Community*</i>	10 (58.8)	46 (74.2)	43 (79.6)	22 (36.7)	16 (26.7)
<i>Other</i>	2 (11.8)	4 (6.6)	1 (1.9)	2 (3.3)	1 (1.7)
Most Trusted Source of Information					
<i>Relatives*</i>	16 (53.3)	25 (40.3)	37 (48.7)	13 (21.3)	4 (6.2)
<i>Mullahs*</i>	6 (20.0)	17 (27.4)	34 (44.7)	7 (11.5)	13 (20)
<i>Government*</i>	2 (6.7)	30 (48.4)	4 (5.3)	21 (34.4)	2 (3.1)
<i>Community Leaders*</i>	7 (23.3)	20 (32.3)	23 (30.3)	10 (16.4)	6 (9.2)
<i>Health Personnel*</i>	2 (6.7)	11 (17.7)	16 (21.1)	0 (0)	0
<i>Vet Personnel*</i>	12 (40)	45 (72.6)	45 (59.2)	17 (27.9)	38 (58.5)
<i>Teachers*</i>	7 (23.3)	27 (43.6)	35 (46.1)	3 (4.9)	4 (6.2)
<i>Other</i>	0	0	0	1 (1.6)	0
Think AI is a threat to human health*					
Yes	15 (46.9)	50 (80.7)	37 (50.7)	59 (98.3)	25 (38.5)
Don't know	17 (53.1)	10 (16.3)	34 (46.6)	1 (1.7)	32 (49.2)
Think AI effects:*					
<i>Only Chickens</i>	1 (3.1)	10 (16.4)	5 (6.7)	18 (28.3)	12 (18.5)
<i>All birds</i>	11 (34.4)	36 (59.0)	22 (29.3)	21 (32.8)	33 (50.8)
<i>Don't know</i>	20 (62.50)	15 (24.6)	41 (54.7)	24 (37.5)	20 (30.8)
Knows about AI in poultry in Afg					
Yes	12 (37.5)	52 (83.9)	9 (11.7)	58 (90.6)	30 (46.9)
Don't know	19 (59.4)	8 (12.9)	48 (62.3)	4 (6.25)	29 (45.3)
Thinks there have been human cases					
Yes	0	5 (8.1)	2 (2.6)	0	5 (7.8)
Don't know	25 (78.1)	41 (66.1)	48 (61.5)	30 (46.9)	42 (65.6)
What measures have been taken by government					
Nothing*	24 (77.4)	17 (27.9)	32 (40.5)	20 (32.8)	48 (73.9)
Slaughter *	1 (3.2)	29 (47.5)	22 (27.9)	12 (19.7)	2 (3.1)
Restrict poultry*	0	12 (19.7)	2 (2.5)	2 (3.3)	0
Restrict human *	0	0	5 (6.3)	21 (34.4)	0
Prevent import	6 (19.4)	20 (32.8)	27 (34.2)	13 (21.3)	15 (23.1)
AI in poultry in other parts of the world					
Yes	9 (28.1)	47 (77.1)	38 (48.1)	40 (62.5)	12 (19.1)
Don't know	23 (71.8)	13 (21.3)	39 (49.4)	21 (32.8)	51 (81.0)
AI in humans in other parts of the world*					
Yes	9 (28.1)	30 (48.4)	37 (48.1)	7 (10.9)	7 (10.8)
Don't know	23 (71.9)	30 (48.4)	39 (50.7)	38 (59.4)	52 (80)

• χ^2 Significant $P < 0.05$

Table 4: Knowledge of AI, SEQ

Number (%) heard of AI	241 (82.5)	44 (72.1)	50 (87.7)	48 (84.2)	52 (83.9)	47 (85.5)
Where Heard of AI	All	1	2	3	4	5

<i>Radio</i>	107 (43.5)	10 (20.8)	18 (34.0)	20 (42.6)	24 (43.6)	35 (71.4)
<i>TV</i>	84 (33.3)	9 (18.8)	8 (15.1)	19 (40.4)	25 (45.5)	23 (46.9)
<i>Health Personnel</i>	61 (24.2)	9 (18.8)	18 (34.0)	15 (31.9)	9 (16.4)	10 (20.4)
<i>Vet Personnel</i>	24 (9.5)	4 (0.3)	0	5 (10.6)	5 (9.1)	10 (20.4)
<i>Schools</i>	20 (7.9)	3 (6.3)	1 (1.9)	6 (12.8)	2 (3.6)	8 (16.3)
<i>Community</i>	136 (54.0)	21 (43.8)	33 (62.3)	21 (44.7)	30 (54.6)	31 (63.3)
<i>Other</i>	10 (4.0)	2 (4.3)	2 (3.8)	2 (4.26)	1 (1.8)	3 (6.1)
Most Trusted Source of Information						
<i>Relatives</i>	94 (32)	19 (30.7)	28 (47.5)	10 (17.9)	15 (24.6)	22 (40)
<i>Mullahs</i>	77 (26.3)	18 (29.0)	17 (28.8)	8 (14.3)	50 (24.6)	19 (34.6)
<i>Government</i>	59 (20.1)	8 (12.9)	15 (25.4)	13 (23.21)	10 (16.4)	13 (23.6)
<i>Community Leaders</i>	65 (22.2)	10 (16.1)	20 (33.9)	10 (17.9)	9 (14.8)	16 (29.1)
<i>Health Personnel</i>	29 (9.9)	3 (4.8)	3 (5.0)	6 (10.7)	3 (4.9)	14 (25.5)
<i>Vet Personnel</i>	157 (53.6)	28 (45.2)	35 (59.3)	38 (67.9)	29 (47.5)	27 (49.1)
<i>Teachers</i>	76 (25.9)	4 (6.5)	6 (10.2)	19 (33.9)	19 (31.2)	28 (50.9)
<i>Other</i>	1 (0.3)	0	1 (1.7)	0	0	0
Think AI is a threat to human health						
Yes	185 (63.6)	21 (33.9)	35 (59.3)	44 (77.2)	41 (67.2)	44 (84.6)
Don't know	94 (32.3)	36 (58.1)	22 (37.3)	12 (21.1)	17 (27.9)	7 (13.5)
Think AI effects:						
Only Chickens	45 (15.5)	11 (18.0)	13 (22.0)	5 (9.1)	10 (16.7)	6 (10.9)
All birds	123 (42.4)	19 (31.2)	32 (54.2)	33 (60.0)	17 (28.3)	22 (40)
Don't know	114 (39.3)	29 (47.5)	13 (22.0)	13 (23.6)	32 (53.3)	27 (49.1)
Knows about AI in poultry in Afg						
Yes	158 (54.1)	21 (34.4)	36 (61.0)	41 (71.9)	38 (63.3)	22 (40.0)
Don't know	104 (35.6)	34 (55.7)	20 (33.9)	15 (26.3)	17 (28.3)	18 (32.7)
Thinks there have been human cases						
Yes	12 (4.1)	2 (3.3)	1 (1.7)	6 (10.5)	2 (3.2)	1 (1.9)
Don't know	180 (61.4)	43 (70.5)	47 (71.7)	31 (54.4)	37 (59.7)	22 (40.7)
What measures have been taken by government						
Nothing	139 (47.9)	44 (72.1)	34 (58.6)	24 (42.9)	18 (29.5)	19 (35.2)
slaughter	65 (22.4)	11 (18.0)	11 (19.0)	14 (25.0)	20 (32.8)	9 (16.7)
Restrict poultry	16 (5.5)	4 (6.6)	5 (8.6)	4 (7.1)	1 (1.6)	2 (3.7)
Restrict humans	22 (7.6)	0	0	2 (3.6)	10 (16.4)	10 (18.5)
Prevent import	80 (27.6)	5 (8.2)	12 (20.7)	20 (35.7)	20 (32.8)	23 (42.6)
AI in poultry in other parts of the world						
Yes	114 (49.3)	8 (13.3)	29 (49.2)	32 (57.1)	32 (51.6)	43 (78.2)
Don't know	142 (48.6)	51 (85)	30 (50.9)	22 (39.3)	29 (46.8)	10 (18.2)
AI in humans in other parts of the world						
Yes	90 (30.7)	2 (3.2)	12 (20.3)	21 (36.8)	19 (31.2)	36 (66.7)
Don't know	176 (60.1)	51 (82.3)	41 (69.5)	30 (52.6)	38 (62.3)	16 (29.6)

Table 5: Poultry and Other Animal Handling, by province:

	Herat	Kabul	Kandahar	Nangahar	Samangan
N (%) owning chickens	21 (65.6)	48 (76.2)	29 (38.2)	39 (60.9)	58 (89.2)
Appropriate Actions for poultry handling					
<i>Keep species separate</i>	19 (63.3)	33 (52.4)	64 (87.1)	33 (51.6)	34 (58.8)
<i>Keep sick birds separate</i>	23 (76.7)	50 (79.4)	47 (59.5)	58 (90.6)	26 (41.9)
<i>Disinfect regularly</i>	5 (16.7)	30 (47.6)	50 (63.3)	17 (26.6)	10 (16.1)
<i>Quarantine new birds</i>	2 (6.7)	40 (63.5)	55 (69.6)	27 (42.2)	1 (1.6)
Action in suspected outbreak					
<i>Visit other farms</i>	7 (22.6)	28 (44.4)	3 (3.8)	4 (6.5)	2 (3.1)

<i>Sell all sick birds</i>	13 (41.9)	10 (15.9)	36 (45.6)	15 (24.2)	57 (87.7)
<i>Slaughter the flock</i>	2 (6.5)	42 (66.7)	11 (13.9)	10 (16.1)	13 (20)
<i>Bury the carcasses</i>	1 (3.2)	20 (31.8)	19 (24.1)	13 (21.0)	2 (3.1)
<i>Use protective clothing</i>	10 (32.2)	31 (49.2)	10 (12.7)	37 (59.7)	16 (24.6)
<i>Disinfect</i>	3 (9.7)	34 (54.0)	8 (10.1)	8 (12.9)	0
<i>Report to government authorities</i>	8 (25.8)	24 (38.1)	30 (38.0)	32 (51.6)	3 (4.6)
<i>Let the children play with sick animals</i>	4 (12.9)	3 (4.8)	28 (35.4)	27 (43.6)	0
<i>Transport birds far away</i>	1 (3.2)	12 (19.1)	39 (49.4)	40 (20.6)	0
Use protective clothing for plucking	5 (16.1)	14 (22.2)	23 (29.1)	1 (1.6)	0
Handling of dead birds					
<i>Bury them</i>	10 (31.3)	40 (65.6)	61 (79.2)	14 (22.6)	50 (76.9)
<i>Throw them away</i>	16 (50)	7 (11.5)	12 (15.6)	1 (1.6)	7 (10.8)
<i>Don't touch and report</i>	7 (21.9)	26 (42.6)	12 (15.6)	26 (41.9)	8 (12.3)
<i>Burn them</i>	0	4 (6.6)	22 (28.6)	26 (41.9)	0
Touch dead birds without protection					
<i>Yes</i>	17 (53.1)	39 (62.9)	19 (24.1)	51 (82.3)	45 (70.3)
<i>Sometimes</i>	7 (21.9)	18 (29.0)	22 (27.9)	11 (17.7)	11 (17.2)
Report sick animals to vet					
<i>Yes</i>	10 (32.3)	18 (28.6)	36 (46.2)	46 (74.2)	12 (18.5)
<i>Sometimes</i>	6 (19.4)	11 (17.5)	8 (10.3)	14 (22.6)	31 (47.7)
Report sick poultry to vet					
<i>Yes</i>	10 (31.3)	19 (31.2)	27 (34.6)	32 (53.3)	2 (3.1)
<i>Sometimes</i>	7 (21.9)	4 (6.6)	5 (6.4)	25 (41.7)	27 (41.5)
Report dead animals to local vet					
<i>Yes</i>	9 (28.1)	19 (30.7)	17 (21.5)	39 (66.1)	7 (10.8)
<i>Sometimes</i>	5 (15.6)	5 (8.1)	0	10 (17.0)	21 (32.3)
Report dead poultry to local vet					
<i>Yes</i>	11 (34.4)	21 (34.4)	16 (20.5)	42 (71.2)	6 (9.2)
<i>Sometimes</i>	5 (15.6)	1 (1.6)	1 (1.3)	8 (13.6)	17 (26.1)
Would vaccinate livestock (including poultry)					
<i>Yes</i>	17 (56.7)	17 (27.9)	32 (31.6)	47 (75.8)	25 (39.1)
<i>Yes, but only expensive livestock</i>	1 (3.3)	15 (24.6)	20 (26.0)	3 (4.8)	27 (42.2)
If no, why not?					
<i>Too expensive</i>	0	6 (13.9)	4 (14.3)	1 (6.7)	4 (25)
<i>No veterinarian available</i>	9 (75)	24 (55.8)	3 (10.7)	1 (6.7)	10 (62.5)
<i>Don't see the purpose</i>	3 (25)	2 (4.7)	20 (71.4)	12 (80)	0
<i>Other</i>	0	11 (25.6)	1 (3.6)	1 (6.7)	1 (6.3)
Do not Own fighting birds	27 (84.4)	52 (83.9)	73 (94.8)	59 (98.3)	34 (54.8)
Have direct physical contact with fighting birds					
<i>Yes</i>	7 (58.3)	7 (41.2)	5 (62.5)	56 (98.3)	23 (46.9)
<i>Sometimes</i>	1 (8.3)	0	3 (37.5)	1 (1.7)	8 (16.3)
Have pigeons	20 (64.5)	44 (75.9)	58 (74.4)	49 (77.8)	41 (65.1)
Pigeons kept separated from other birds	10 (83.3)	13 (65)	18 (72)	30 (63.8)	11 (28.2)
Transport pigeons and fighting birds from one place to another					
<i>Yes</i>	6 (28.6)	9 (24.3)	2 (8.0)	1 (2.1)	19 (32.2)
<i>Sometimes</i>	5 (23.8)	8 (21.6)	9 (36.0)	0	7 (11.9)
Hunt wild birds					
<i>Yes</i>	0	6 (9.8)	2 (2.6)	0	1 (1.5)
<i>Sometimes</i>	6 (20.7)	6 (1.8)	29 (38.2)	14 (24.14)	11 (16.9)

Table 6: Poultry and Other Animal Handling, SEQ:

	All	1	2	3	4	5
N (%) owning chickens	191 (65.2)	53 (85.5)	49 (84.5)	40 (70.2)	29 (47.5)	20 (36.4)
Appropriate Actions for poultry handling						
<i>Keep species separate</i>	179 (61.5)	34 (55.74)	30 (52.6)	35 (62.5)	36 (58.1)	44 (80)
<i>Keep sick birds separate</i>	200 (68.7)	30 (49.2)	41 (71.9)	40 (71.4)	47 (75.8)	42 (76.4)
<i>Disinfect regularly</i>	111 (38.10)	11 (18.0)	10 (17.5)	27 (48.2)	22 (35.5)	41 (74.6)
<i>Quarantine new birds</i>	121 (41.6)	7 (11.5)	15 (26.3)	26 (46.3)	33 (53.2)	40 (72.7)
Action in suspected outbreak						
<i>Visit other farms</i>	44 (15.0)	7 (11.3)	13 (22.4)	13 (22.8)	6 (9.8)	5 (9.1)
<i>Sell all sick birds</i>	127 (43)	41 (66)	24 (41.4)	25 (43.9)	27 (44.3)	10 (18.2)
<i>Slaughter the flock</i>	77 (26.3)	14 (22.6)	22 (37.9)	16 (28.1)	15 (24.6)	10 (18.2)
<i>Bury carcasses</i>	55 (18.8)	8 (12.9)	12 (20.7)	11 (19.3)	11 (18.0)	13 (23.6)
<i>Use protective clothing</i>	102 (34.8)	15 (24.2)	23 (39.7)	30 (52.6)	15 (24.6)	19 (34.6)
<i>Disinfect</i>	53 (18.1)	5 (8.1)	17 (29.3)	16 (28.1)	6 (9.8)	9 (16.4)
<i>Report to government authorities</i>	95 (32.4)	7 (11.3)	60 (27.6)	14 (24.6)	29 (47.5)	29 (52.7)
<i>Let the children play with sick animals</i>	59 (20.1)	0	1 (1.7)	7 (12.3)	21 (34.4)	30 (54.6)
<i>Transport birds far away</i>	65 (22.2)	3 (4.8)	5 (8.6)	10 (17.5)	17 (27.9)	30 (54.6)
Use protective clothing for plucking	43 (14.7)	0	5 (8.6)	9 (15.8)	6 (9.8)	23 (41.8)
Handling of dead birds						
<i>Bury them</i>	173 (59.6)	53 (67.7)	30 (51.7)	30 (54.5)	33 (55.0)	38 (69.1)
<i>Throw them away</i>	41 (14.1)	15 (24.2)	10 (17.2)	4 (7.24)	9 (15.0)	3 (5.5)
<i>Don't touch and report</i>	79 (27.2)	10 (16.1)	22 (37.9)	23 (41.8)	11 (18.3)	13 (23.6)
<i>Burn them</i>	49 (16.9)	1 (1.6)	1 (1.7)	3 (5.5)	16 (26.7)	28 (50.9)
Touch dead birds without protection						
<i>Yes</i>	57 (19.5)	12 (19.4)	7 (12.1)	2 (3.6)	15 (24.6)	21 (38.2)
<i>Sometimes</i>	68 (23.3)	15 (24.2)	50 (25.9)	30 (23.2)	17 (23.0)	8 (14.6)
Report sick animals to vet						
<i>Yes</i>	117 (40.1)	8 (13.1)	23 (38.9)	20 (35.1)	28 (45.9)	38 (70.4)
<i>Sometimes</i>	70 (23.9)	22 (36.1)	9 (15.3)	19 (33.3)	10 (16.4)	10 (18.5)
Report sick poultry to vet						
<i>Yes</i>	86 (29.8)	6 (10)	14 (24)	18 (32.1)	21 (34.4)	27 (50)
<i>Sometimes</i>	67 (23.2)	18 (30)	12 (20.7)	15 (26.8)	13 (21.3)	9 (16.7)
Report dead animals to local vet						
<i>Yes</i>	87 (30)	9 (14.5)	17 (29.8)	21 (38.2)	20 (32.8)	20 (36.4)
<i>Sometimes</i>	41 (14.1)	14 (22.6)	7 (12.3)	10 (18.2)	6 (9.8)	4 (7.3)
Report dead poultry to local vet						
<i>Yes</i>	92 (31.9)	8 (13.3)	17 (29.3)	24 (43.6)	23 (37.7)	20 (37.0)
<i>Sometimes</i>	32 (11.1)	11 (18.3)	5 (8.6)	7 (12.7)	5 (8.2)	4 (7.4)
Would vaccinate livestock (including poultry)						
<i>Yes</i>	135 (47.0)	32 (53.3)	23 (39.7)	25 (45.5)	23 (37.7)	10 (18.9)
<i>Yes, but only expensive livestock</i>	65 (22.7)	11 (18.3)	14 (24.1)	15 (26.3)	13 (21.3)	12 (22.6)
If no, why not?						

<i>Too expensive</i>	14 (12.7)	4 (19.1)	6 (20)	4 (19.1)	0	0
<i>No veterinarian available</i>	47 (42.7)	13 (61.9)	16 (53.3)	10 (47.6)	6 (25)	2 (14.3)
<i>Don't see the purpose</i>	34 (30.9)	2 (9.5)	2 (6.7)	6 (28.6)	15 (62.5)	9 (64.3)
<i>Other</i>	14 (12.7)	1 (4.8)	6 (20)	1 (4.7)	3 (12.5)	3 (21.4)
Own fighting birds	48 (16.8)	9 (15.5)	12 (20.7)	18 (32.7)	8 (13.1)	1 (1.9)
Have direct physical contact with fighting birds						
<i>Yes</i>	32 (23)	3 (7.7)	9 (33.3)	15 (51.7)	5 (16.7)	0
<i>Sometimes</i>	13 (9.4)	6 (15.4)	3 (11.1)	1 (3.5)	3 (10)	0
Have pigeons	80 (28)	19 (31.7)	18 (30.5)	18 (33.9)	15 (24.6)	10 (18.9)
Pigeons kept separated from other birds	80 (57.9)	15 (38.5)	13 (50)	20 (64.5)	20 (80)	12 (70.6)
Transport pigeons and fighting birds from one place to another						
<i>Yes</i>	37 (20)	7 (13.2)	7 (17.1)	15 (37.5)	7 (20)	1 (6.3)
<i>Sometimes</i>	29 (15.7)	8 (15.1)	6 (14.6)	4 (10)	6 (17.1)	5 (31.3)
Hunt wild birds						
<i>Yes</i>	9 (3.2)	2 (3.4)	3 (5.5)	1 (1.9)	2 (3.3)	1 (1.9)
<i>Sometimes</i>	64 (22.7)	8 (13.6)	10 (18.2)	7 (12.9)	21 (35)	18 (33)

Table 7: Hygiene attitudes and practices, by provinces

	Herat	Kabul	Kandahar	Nangahar	Samangan
It is necessary to clean/disinfect the cages used for transporting poultry					
<i>Yes</i>	19 (59.4)	18 (29.5)	40 (50.6)	53 (82.8)	8 (12.3)
<i>Sometimes</i>	6 (18.8)	23 (37.7)	15 (19.0)	11 (17.2)	16 (24.6)
It is necessary to wash hands after handling animals					
<i>Yes</i>	23 (71.9)	29 (46.8)	45 (57.0)	49 (76.6)	25 (38.5)
<i>Sometimes</i>	5 (15.6)	17 (27.4)	17 (21.5)	15 (23.4)	24 (36.9)
It is necessary to wash hands after sneezing					
<i>Yes</i>	7 (21.9)	32 (52.5)	13 (16.7)	8 (12.5)	30 (46.2)
<i>Sometimes</i>	12 (37.5)	17 (27.9)	3 (3.9)	39 (60.9)	26 (40)
It is necessary to wash hands after toilets					
<i>Yes</i>	3 (9.4)	1 (1.6)	6 (7.6)	0	7 (10.8)
<i>Sometimes</i>	9 (28.9)	4 (6.6)	0	0	19 (29.2)
Necessary to wash hands after slaughtering animals					
<i>Yes</i>	3 (9.4)	1 (1.7)	1 (1.3)	0	9 (13.9)
<i>Sometimes</i>	5 (15.6)	7 (11.7)	0	1 (1.6)	21 (32.3)
Necessary to disinfect shoes before entering a poultry farm					
<i>Yes</i>	19 (59.4)	25 (41.7)	57 (72.2)	31 (49.2)	45 (81.5)
<i>Sometimes</i>	10 (31.3)	14 (23.3)	5 (6.33)	22 (34.9)	8 (12.3)
Necessary to wash hands after handling poultry					
<i>Yes</i>	12 (37.5)	45 (77.6)	36 (46.8)	48 (77.4)	14 (21.5)
<i>Sometimes</i>	9 (28.1)	6 (10.3)	20 (26.0)	14 (22.6)	27 (41.5)
Necessary to wash hands before and after cooking					
<i>Yes</i>	25 (78.1)	55 (90.2)	78 (98.7)	63 (100)	39 (60)
<i>Sometimes</i>	5 (15.6)	6 (9.8)	1 (1.3)	0	20 (30.8)

Use soap when wash hands					
<i>Yes</i>	2 (6.3)	11 (18.3)	39 (49.4)	0	14 (21.9)
<i>Sometimes</i>	18 (56.3)	30 (50)	13 (16.5)	26 (41.9)	24 (37.5)
In the last week, washed hands after:					
<i>Cleaning birds cages</i>	12 (37.5)	13 (20.9)	48 (60.8)	28 (43.8)	7 (10.8)
<i>Handling animals</i>	4 (12.5)	8 (12.9)	36 (45.6)	30 (46.9)	39 (60)
<i>Handling chickens</i>	11 (34.4)	29 (46.8)	34 (43)	17 (26.6)	14 (21.5)
<i>Using the latrine</i>	14 (43.8)	60 (96.8)	39 (49.4)	43 (67.2)	56 (86.2)
<i>Slaughtering animals</i>	3 (9.4)	7 (11.3)	79 (100)	40 (62.5)	6 (9.2)
<i>Before cooking</i>	18 (56.3)	29 (46.8)	62 (78.5)	38 (59.4)	2 (3.1)

Table 8: Hygiene attitudes and practices, SEQ

	All	1	2	3	4	5
It is necessary to clean/disinfect the cages used for transporting poultry						
<i>Yes</i>	168 (57.0)	14 (22.6)	22 (37.3)	27 (48.2)	38 (61.3)	36 (65.5)
<i>Sometimes</i>	67 (22.8)	26 (41.9)	11 (18.6)	13 (23.2)	18 (28.6)	9 (16.4)
It is necessary to wash hands after handling animals						
<i>Yes</i>	168 (56.9)	24 (38.7)	30 (50.9)	39 (69.6)	37 (58.7)	38 (69.1)
<i>Sometimes</i>	77 (26.1)	26 (41.9)	11 (18.6)	13 (23.2)	18 (28.6)	9 (16.4)
It is necessary to wash hands after sneezing						
<i>Yes</i>	87 (29.7)	22 (35.5)	26 (44.8)	17 (30.4)	18 (28.6)	4 (7.4)
<i>Sometimes</i>	95 (32.4)	28 (45.2)	13 (22.4)	22 (29.3)	19 (30.2)	13 (24.1)
It is necessary to wash hands after toilets						
<i>Yes</i>	16 (5.5)	8 (12.9)	1 (1.7)	2 (3.7)	2 (3.2)	3 (5.5)
<i>Sometimes</i>	32 (11.0)	21 (33.9)	7 (12.1)	3 (5.6)	1 (1.6)	0
Necessary to wash hands after slaughtering animals						
<i>Yes</i>	14 (4.8)	8 (13.1)	3 (5.3)	1 (1.8)	1 (1.6)	1 (1.8)
<i>Sometimes</i>	34 (11.7)	19 (31.2)	9 (15.8)	5 (9.1)	1 (1.6)	0
Necessary to disinfect shoes before entering a poultry farm						
<i>Yes</i>	179 (61.3)	46 (74.2)	39 (66.1)	30 (55.6)	38 (61.3)	26 (47.3)
<i>Sometimes</i>	58 (19.9)	11 (17.7)	13 (22)	10 (18.5)	16 (25.8)	8 (14.6)
Necessary to wash hands after handling poultry						
<i>Yes</i>	151 (52.6)	20 (33.3)	29 (52.7)	32 (58.3)	35 (55.6)	35 (64.8)
<i>Sometimes</i>	75 (26.1)	21 (35)	10 (18.2)	16 (29.1)	18 (28.6)	10 (18.5)
Necessary to wash hands before and after cooking						
<i>Yes</i>	254 (86.7)	36 (58.1)	51 (87.9)	50 (90.9)	63 (100)	54 (98.2)
<i>Sometimes</i>	31 (10.6)	20 (32.3)	6 (10.3)	4 (7.3)	0	1 (1.8)
Use soap when wash hands						
<i>Yes</i>	63 (21.7)	13 (21.3)	11 (19.3)	8 (14.5)	18 (28.6)	13 (24.1)
<i>Sometimes</i>	108 (37.2)	21 (34.4)	24 (42.1)	24 (43.6)	26 (41.3)	13 (24.1)
In the last week, washed hands after:						
<i>Cleaning birds cages</i>	105 (35.6)	15 (24.2)	12 (20.3)	20 (35.7)	25 (39.7)	33 (60)
<i>Handling animals</i>	115 (38.9)	25 (40.3)	12 (20.3)	26 (46.4)	23 (36.5)	29 (52.7)
<i>Handling chickens</i>	103 (34.9)	15 (24.2)	18 (30.5)	18 (32.1)	25 (39.7)	27 (49.1)
<i>Using the latrine</i>	209 (70.8)	48 (77.4)	50 (84.8)	42 (75.0)	39 (61.9)	30 (54.6)
<i>Slaughtering animals</i>	128 (43.4)	10 (16.1)	8 (13.6)	15 (26.8)	43 (68.3)	52 (94.6)
<i>Before cooking</i>	144 (49.0)	17 (27.4)	21 (35.6)	23 (41.8)	40 (63.5)	43 (78)

Table 9: Cooking and food hygiene, by provinces

	Herat	Kabul	Kandahar	Nangahar	Samangan
Eat meat from birds that look sick					
<i>Yes</i>	6 (18.8)	9 (14.5)	36 (45.6)	0	3 (4.6)
<i>Sometimes</i>	2 (6.3)	9 (14.5)	6 (7.6)	8 (12.7)	6 (9.2)
When cook poultry meat, make sure the meat is not pink					
<i>Yes</i>	30 (93.8)	53 (85.5)	79 (100)	63 (100)	58 (89.3)
<i>Sometimes</i>	1 (3.1)	6 (8.1)	0	0	0
Keep raw poultry and eggs away from other food					
<i>Yes</i>	4 (12.5)	16 (26.7)	23 (29.1)	32 (50.8)	14 (21.5)
<i>Sometimes</i>	15 (46.9)	16 (26.7)	0	22 (34.9)	25 (38.5)
Clean instruments with soap after slaughtering chickens					
<i>Yes</i>	7 (21.9)	24 (38.7)	57 (72.2)	63 (100)	4 (6.2)
<i>Sometimes</i>	16 (50)	14 (22.6)	0	0	30 (46.2)
Eat raw or half cooked eggs					
<i>Yes</i>	15 (51.7)	1 (1.7)	3 (3.8)	0	12 (18.1)
<i>Sometimes</i>	4 (13.8)	9 (15)	0	1 (1.6)	20 (31.8)

Table 10: Cooking and food hygiene, by SEQ

	All	1	2	3	4	5
Eat meat from birds that look sick						
<i>Yes</i>	51 (17.4)	7 (11.3)	11 (18.6)	2 (3.6)	12 (19.4)	19 (34.6)
<i>Sometimes</i>	30 (10.2)	8 (12.9)	10 (17)	7 (12.5)	4 (6.5)	1 (1.8)
When cook poultry meat, make sure the meat is not pink						
<i>Yes</i>	276 (93.9)	54 (87.1)	56 (94.9)	50 (89.3)	61 (98.4)	55 (100)
<i>Sometimes</i>	6 (2.0)	1 (1.6)	3 (5.1)	2 (3.6)	0	0
Keep raw poultry and eggs away from other food						
<i>Yes</i>	87 (29.8)	12 (19.4)	16 (27.6)	15 (27.3)	23 (37.1)	21 (38.2)
<i>Sometimes</i>	76 (26.0)	19 (30.7)	17 (29.3)	22 (40)	10 (16.1)	8 (14.6)
Clean instruments with soap after slaughtering chickens						
<i>Yes</i>	149 (50.7)	17 (27.4)	16 (27.1)	33 (58.9)	40 (64.5)	43 (78.2)
<i>Sometimes</i>	60 (20.4)	22 (35.5)	23 (40)	8 (14.3)	6 (9.6)	1 (1.8)
Eat raw or half cooked eggs						
<i>Yes</i>	31 (10.8)	16 (26.7)	4 (7.1)	5 (8.9)	4 (6.7)	2 (3.6)
<i>Sometimes</i>	34 (11.9)	14 (23.3)	10 (17.9)	6 (10.7)	4 (6.7)	0

Table 11: Human Influenza knowledge and treatment seeking behaviours, by Povinces

	Herat	Kabul	Kandahar	Nangahar	Samangan
Diseases considered as the most serious threat					
<i>Diarrhoea</i>	18 (56.3)	54 (87.1)	43 (54.4)	12 (18.8)	23 (35.4)
<i>Cough/Pneumonia</i>	11 (34.4)	25 (40.3)	38 (48.1)	7 (10.9)	20 (30.7)
<i>Avian Influenza</i>	14 (43.8)	30 (48.4)	13 (16.5)	54 (84.4)	0
<i>Malaria</i>	15 (46.9)	5 (8.1)	79 (100)	8 (12.5)	7 (10.8)
<i>TB</i>	17 (54.8)	5 (9.6)	31 (39.2)	3 (4.7)	18 (27.7)

AI can be transmitted to humans by					
<i>Eating uncooked poultry</i>	15 (48.4)	50 (80.7)	70 (86.6)	44 (68.8)	42 (64.6)
<i>Contact with dead or sick poultry</i>	12 (38.7)	47 (75.8)	37 (46.8)	14 (21.9)	39 (60)
<i>Contact with dead or sick wild birds</i>					
<i>From water</i>	0	5 (8.1)	6 (7.6)	3 (4.7)	1 (1.5)
<i>From milk</i>	1 (3.2)	2 (3.2)	9 (11.4)	32 (50)	1 (1.5)
<i>Contact with poultry droppings</i>	20 (64.5)	12 (19.4)	3 (3.8)	14 (21.9)	4 (6.2)
<i>Human to human</i>	2 (6.5)	13 (21)	5 (6.3)	5 (7.8)	5 (7.7)
<i>Contact with eggs</i>	4 (12.9)	31 (50)	5 (6.3)	6 (9.4)	24 (36.9)
<i>From infected food</i>	5 (16.1)	3 (4.8)	5 (6.3)	3 (4.8)	0
After touching sick or dead poultry, if you are sick with fever, do you seek treatment?					
<i>Yes, immediately</i>	17 (53.1)	20 (32.8)	44 (57.1)	32 (50)	39 (60)
<i>Yes, after one or 2 days</i>	5 (15.6)	17 (27.9)	12 (15.6)	11 (17.2)	13 (20)
<i>Yes, if the person is really sick</i>	10 (31.3)	21 (34.4)	1 (1.3)	7 (10.9)	3 (4.6)
<i>No</i>	0	1 (1.6)	14 (18.2)	12 (18.8)	1 (1.5)
<i>Sometimes</i>	0	2 (3.3)	6 (7.8)	2 (3.1)	9 (13.9)
If yes, where do you seek treatment?					
<i>Mullah</i>	4 (12.5)	9 (14.8)	4 (5.6)	8 (12.7)	15 (23.1)
<i>Traditional healer</i>	1 (3.1)	12 (19.7)	8 (11.1)	1 (1.6)	5 (7.7)
<i>NGO or gov clinic or hospital</i>	20 (62.5)	34 (55.7)	32 (44.4)	48 (76.2)	14 (21.5)
<i>Private doctor</i>	15 (46.9)	24 (39.3)	31 (43.1)	11 (17.5)	24 (36.9)
<i>Pharmacy</i>	1 (3.1)	1 (1.6)	0	0	0
<i>CHW</i>	0	0	0	0	0
<i>Other</i>	3 (9.4)	7 (11.5)	12 (16.7)	19 (30.2)	8 (12.3)
What are the existing treatments against AI?					
<i>Vaccine</i>	14 (45.2)	30 (51.7)	51 (65.4)	47 (73.4)	2 (3.2)
<i>Pills taken after illness starts</i>	1 (3.2)	17 (29.3)	0	16 (25)	0
<i>There are no treatments</i>	16 (51.6)	9 (15.5)	27 (34.6)	0	60 (96.8)

Table 12: Human Influenza knowledge and treatment seeking behaviours, SEQ

	All	1	2	3	4	5
Diseases considered as the most serious threat						
<i>Diarrhoea</i>	148 (50.2)	31 (50)	35 (59.3)	31 (55.4)	26 (41.3)	25 (45.5)
<i>Cough/Pneumonia</i>	100 (33.9)	17 (26.4)	29 (49.2)	22 (39.3)	17 (26.9)	15 (27.3)
<i>Avian Influenza</i>	108 (36.6)	15 (24.2)	17 (28.8)	25 (44.6)	26 (41.3)	25 (45.5)
<i>Malaria</i>	111 (37.6)	13 (20.9)	15 (24.4)	14 (25)	28 (44.4)	41 (74.6)
<i>TB</i>	73 (25.7)	15 (25)	11 (20)	12 (22.2)	17 (28.3)	18 (32.7)
AI can be transmitted to humans by						
<i>Eating uncooked poultry</i>	217 (73.8)	39 (62.9)	43 (71.4)	41 (73.2)	49 (77.8)	45 (81.8)
<i>Contact with dead or sick poultry</i>	149 (50.7)	31 (50)	35 (60.3)	35 (62.5)	23 (36.5)	25 (45.5)
<i>Contact with dead or sick wild birds</i>						
<i>From water</i>	15 (5.1)	0	2 (3.5)	3 (5.4)	3 (4.8)	7 (12.7)
<i>From milk</i>	42 (14.3)	4 (6.4)	4 (6.9)	6 (10.7)	15 (23.8)	13 (23.6)
<i>Contact with poultry droppings</i>	53 (18.0)	10 (16.1)	19 (32.8)	12 (21.4)	8 (12.7)	4 (7.3)
<i>Human to human</i>	29 (9.9)	3 (4.8)	7 (12.1)	10 (17.9)	5 (7.9)	4 (7.3)
<i>Contact with eggs</i>	70 (23.8)	17 (27.4)	17 (29.3)	23 (41.1)	8 (12.7)	5 (9.1)
<i>From infected food</i>	15 (5.1)	3 (3.2)	2 (3.5)	4 (7.1)	3 (4.8)	4 (7.3)
After touching sick or dead poultry, if you are sick with fever, do you seek treatment?						
<i>Yes, immediately</i>	150 (51.4)	27 (43.6)	20 (34.5)	32 (58.2)	37 (59.7)	34 (61.8)
<i>Yes, after one or 2 days</i>	56 (19.2)	17 (27.4)	11 (19.0)	8 (13.6)	11 (17.7)	9 (16.4)

<i>Yes, if the person is really sick</i>	42 (14.4)	13 (20.9)	18 (31)	8 (14.6)	2 (3.2)	1 (1.8)
<i>No</i>	25 (8.6)	3 (4.8)	3 (5.2)	5 (9.1)	7 (11.3)	7 (12.7)
<i>Sometimes</i>	19 (6.5)	2 (3.2)	6 (10.3)	2 (3.7)	5 (8.1)	4 (7.3)
If yes, where do you seek treatment?						
<i>Mullah</i>	39 (13.6)	19 (30.7)	10 (17)	5 (9.1)	4 (7.1)	1 (1.9)
<i>Traditional healer</i>	26 (9.1)	5 (8.1)	13 (22.3)	3 (5.5)	4 (7.1)	1 (1.9)
<i>Clinic or hospital</i>	145 (50.7)	32 (51.6)	22 (37.3)	35 (63.6)	34 (60.7)	22 (40.7)
<i>Private doctor</i>	103 (36.0)	18 (21.0)	27 (45.8)	20 (36.4)	15 (26.8)	23 (42.6)
<i>Pharmacy</i>	2 (0.7)	0	2 (3.4)	0	0	0
<i>CHW</i>	0	0	0	0	0	0
<i>Other</i>	47 (16.4)	3 (4.8)	14 (23.7)	6 (10.9)	12 (21.4)	12 (22.2)
What are the existing treatments against AI?						
<i>Vaccine</i>	141 (49.3)	13 (22.8)	18 (31)	27 (50)	36 (57.1)	47 (87.0)
<i>Pills taken after illness starts</i>	33 (11.5)	6 (10.5)	13 (22.4)	8 (14.8)	5 (7.9)	1 (1.9)
<i>There are no treatments</i>	110 (38.5)	38 (66.7)	26 (44.8)	19 (35.2)	21 (33.3)	6 (11.1)

Table 13: Poultry relation, by Province

	Herat	Kabul	Kandahar	Nangahar	Samangan
Backyard poultry owner	18 (66.7)	44 (75.9)	44 (57.1)	60 (98.4)	56 (88.9)
Semi-commercial poultry farm owner	0	1 (1.7)	14 (18.2)	11 (18.0)	0
Big poultry farm owner	0	0	0	0	0
Worker in poultry farm	3 (11.1)	0	6 (7.8)	9 (14.8)	2 (3.2)
Poultry seller	0	0	3 (3.9)	0	0
Butcher	1 (3.7)	3 (5.2)	25 (32.5)	1 (1.6)	0
Buy live poultry and slaughters immediately for food	8 (29.6)	12 (20.7)	3 (3.9)	1 (1.6)	5 (7.9)
Other	0	0	0	0	0
No particular relation to poultry	0	0	0	0	0

Table 14: Poultry relation, by SEQ:

	All	1	2	3	4	5
Backyard poultry owner	216 (77.4)	50 (86.2)	48 (85.7)	41 (76.9)	46 (77.9)	31 (59.6)
Semi-commercial poultry farm owner	25 (8.9)	4 (6.9)	6 (10.7)	1 (1.9)	5 (8.5)	9 (17.3)
Big poultry farm owner	0	0	0	0	0	0
Worker in poultry farm	19 (6.8)	4 (6.0)	6 (10.7)	3 (5.5)	0	6 (11.5)
Poultry seller	3 (1.1)	0	0	0	1 (1.7)	2 (3.9)
Butcher	29 (10.4)	1 (1.7)	0	7 (12.9)	8 (13.6)	13 (25)
Buy live poultry and slaughters immediately for food	29 (10.4)	5 (8.6)	8 (14.3)	9 (16.7)	4 (6.8)	3 (5.8)
Other	0	0	0	0	0	0
No particular relation to poultry	0	0	0	0	0	0

Table 15: Observations, by provinces

	Herat	Kabul	Kandahar	Nangahar	Samangan
Owns a private poultry house	15 (83.3)	5 (9.62)	28 (44.4)	2 (3.7)	28 (44.4)
The poultry house is clearly separated from the rest of the house	17 (85)	26 (49.1)	27 (42.8)	33 (56.9)	43 (74.1)
The birds are kept in cages or in an open floor barn protected from other birds	12 (60)	32 (64)	27 (42.9)	24 (43.6)	42 (72.4)
Poulets are separate from the rest of the	6 (35.3)	35 (68.6)	26 (41.3)	39 (63.9)	42 (71.2)

flock					
Supplies of water and feed are protected	9 (47.4)		26 (41.3)	33 (56.9)	10 (16.7)
The area where poultry is kept is clean	8 (42.1)		33 (100)	45 (75)	28 (49.1)
Birds do not get inside of the house	12 (57.1)	33 (62.26)	48 (76.2)	24 (42.9)	25 (43.1)
Have toilets/latrine	21 (75)	52 (96.3)	71 (89.9)	60 (97.8)	58 (98.3)
Have access to clean water	7 (25)	49 (90.7)	76 (96.2)	61 (100)	11 (18.33)

Table 16: Observations, SEQ

	All	1	2	3	4	5
Owns a private poultry house	51 (21.07)	4 (7.7)	9 (18.37)	11 (23.4)	6 (12.5)	21 (45.65)
The poultry house is clearly separated from the rest of the house	142 (57.7)	31 (62)	36 (70.6)	33 (67.35)	20 (40.8)	22 (46.8)
The birds are kept in cages or in an open floor barn protected from other birds	136 (56.4)	34 (70.8)	24 (49)	38 (77.5)	20 (40.8)	20 (43.5)
Poulets are separate from the rest of the flock	143 (58.6)	31 (63.3)	31 (63.27)	30 (63.8)	30 (56.6)	21 (45.6)
Supplies of water and feed are protected	75 (38.5)	10 (22.2)	16 (48.5)	18 (58.1)	12 (29.27)	19 (42.2)
The area where poultry is kept is clean	111 (67.3)	24 (55.8)	16 (50)	20 (74.07)	25 (75.8)	26 (86.7)
Birds do not get inside of the house	137 (55.9)	23 (46.94)	27 (55.10)	27 (55.1)	31 (60.78)	29 (63.0)
Have toilets/latrine	255 (92.7)	48 (92.3)	51 (94.4)	47 (88.7)	57 (91.9)	52 (96.3)
Have access to clean water	196 (71.5)	21 (38.9)	27 (51.9)	41 (77.4)	54 (88.5)	53 (98.1)

Table 17: Knowledge of AI - Children

	TOTAL
Number (%) heard of AI	70 (69.3)
Where Heard of AI	
<i>Radio</i>	23 (31.1)
<i>TV</i>	21 (28.4)
<i>Teachers</i>	Data missing
<i>Health Personnel</i>	19 (25.7)
<i>Vet Personnel</i>	6 (8.2)
<i>Community</i>	27 (36.5)
<i>Other</i>	7 (9.6)
Favourite TV channel	
<i>Tolo TV</i>	34 (49.28)
<i>Afghan TV</i>	7 (10.45)
<i>RTA</i>	Data missing
<i>Aina</i>	3 (4.5)
<i>Leemar</i>	12 (18.2)
<i>Ariana</i>	20 (29.8)
<i>Shamshad</i>	16 (23.5)
<i>Other</i>	2 (2.9)
Favourite TV programme	
<i>Soap opera</i>	24 (48)
<i>Cartoons</i>	26 (53.5)
<i>News</i>	5 (10.2)
<i>Music clips</i>	33 (67.35)
<i>Other</i>	0
Favourite radio channel	
Most trusted sources of information	
<i>Relatives</i>	Data missing
<i>Mullah</i>	Data missing
<i>Governmental authorities</i>	Data missing

<i>Community leaders</i>	7 (7)
<i>Teachers</i>	40 (40)
<i>Health Personnel</i>	42 (42.8)
<i>Veterinary personnel</i>	22 (22.2)
<i>Other</i>	6 (6.1)
Have there been any instances of AI in poultry in Afghanistan?	
<i>Yes</i>	2 (2.02)
<i>No</i>	49 (49.5)
<i>Don't know</i>	48 (48.5)
Have there been any instances of AI in humans in Afghanistan?	
<i>Yes</i>	1 (1)
<i>No</i>	26 (26.26)
<i>Don't know</i>	72 (72.73)

Table 18: Concern about infection, per Province

	TOTAL
Expect cases of AI in their area	
<i>Yes, between wild birds</i>	2 (2.0)
<i>Yes, between domestic birds</i>	17 (17.2)
<i>Yes, between humans</i>	1 (1.0)
<i>Yes, Between birds and humans at the same time</i>	1 (1.0)
<i>No, don't expect</i>	77 (77.8)
Fear that they will be affected by AI	
<i>Yes</i>	12 (12.2)
<i>Sometimes</i>	21 (21.4)
<i>Not at all</i>	65 (66.3)

Table 19: Knowledge about AI, per Province

	TOTAL
Wash hands with soap after touching poultry	
<i>Yes</i>	25 (25.2)
<i>No</i>	48 (48.5)
<i>Sometimes</i>	26 (26.3)
Play with sick/dead birds	
<i>No</i>	97 (97.9)
<i>Sometimes</i>	2 (2.02)
Eat meat that is not well cooked	
<i>Yes</i>	5 (5.1)
<i>No</i>	83 (84.69)
<i>Sometimes</i>	10 (10.2)
Wash hands with soap before/after eating	
<i>Yes</i>	36 (36.4)
<i>No</i>	35 (35.3)
<i>Sometimes</i>	28 (28.3)

Eat raw eggs	
<i>Yes</i>	9 (9.18)
<i>No</i>	79 (80.6)
<i>Sometimes</i>	10 (10.2)
Report sick/dead birds to adults	
<i>Yes</i>	45 (45.4)
<i>No</i>	31 (31.3)
<i>Sometimes</i>	23 (23.2)

Table 20: Poultry relation, per Province

	TOTAL
Parents have poultry	50 (74.6)
In charge of taking care of poultry	7 (10.8)
In charge of selling poultry	1 (1.5)
Play with poultry	11 (16.9)
No relation with poultry	12 (18.5)
Keep other birds at home	
<i>Yes</i>	31 (45.6)
<i>No</i>	28 (41.18)
<i>Sometimes</i>	9 (13.2)
Hunt wild birds	
<i>Yes</i>	2 (2.9)
<i>No</i>	55 (79.7)
<i>Sometimes</i>	12 (17.4)