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Controlling Avian Flu and Protecting People's Livelihoods in Africa and Indonesia

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Knowledge and Practices of Indonesian Rural Communities and Poultry Farmers Toward Avian Flu

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Key Findings

- Even though rural households and poultry producers are highly aware of HPAI, their knowledge of HPAI symptoms is limited and their knowledge about transmission, preventive measures, and disposal methods are variable.
- Important factors that affect knowledge about HPAI symptoms include education of the household head, household size, income per capita, and past HPAI experience.
- To ensure effective communication with target audiences, awareness campaigns should use training materials appropriate to the socio-demographic and economic characteristics of rural communities and poor poultry producers.

Understanding people's knowledge, attitudes, practices, and perceptions (KAPP) about and toward risk is an important step in determining which cost-effective measure to adopt. It also is important in assessing poor people's willingness to adopt cost-effective prevention and control measures for reducing the risk of highly pathogenic avian influenza (HPAI). Although studies in several countries indicate some level of awareness about HPAI, practices and attitudes for preventing and controlling HPAI disease spread and outbreaks have not changed (Fielding et al. 2005, Maton et al. 2007, DiGiuseppe et al. 2008, Leslie et al. 2008).

Furthermore, various study results have shown that poor communities and poultry farmers tend to perceive the risk of contracting HPAI to be very low. If they understood the potential effects of HPAI infection on their income, wealth, and food security and which prevention and control strategies would be most cost-effective, then they might be more willing to adopt such strategies.

The knowledge and perceptions about and toward HPAI of poor Indonesian households are investigated by asking the following questions: What do poor communities and poultry farmers perceive about the risk of HPAI infections to them and their poultry? What do they think are the factors or drivers of disease transmission? What are their practices for handling sick, infected, or dead birds?

Since the first HPAI outbreak in February 2004, Indonesia continues to report domestic poultry inffected with HPAI, and the recorded infection rate has been increasing, possibly as a result of the government's awareness campaigns. One of the first such campaigns, Tanggap Flu Burung, was launched in coordination with the National Committee on Avian Influenza Control (KOMNAS). It focused on safe poultry consumption and provided guidance on prevention and control measures. Outbreak and incidence records are being used to influence rural communities to take action and change behaviors and practices in HPAI prevention and control. Looking for evidence-based information on the effectiveness of such awareness campaigns, the World Bank commissioned the Small-Scale Avian Influenza Saturation Survey in 2007—one year after Tanggap Flu Burung campaign was launched.

Data and Method

Study data are from the World Bank's Small-Scale Avian Influenza Saturation Survey, conducted in Jogyakarta, Indonesia, in 2007. The total sample size is 4,771 households, of which 3,462 provided answers to the KAPP questions. Most of the households surveyed own chicken and Muscovy ducks, with an average flock size of 5 birds or fewer (Table 1). The KAPP analysis focuses on the 3,013 small-scale poultry producers who owned Kampong chicken or Muscovy ducks.

Table 1. Percentage of households owning poultry at time of survey, by bird type

Flock Size	Kampong Chicken	Duck	Muscovy Duck	Other Bird(s)
0	16.76	90.52	73.53	62.56
1–5	33.52	6.11	16.76	28.93
6–10	25.21	2.34	6.32	5.56
11–15	11.85	0.47	2.05	1.49
16–20	5.76	0.26	0.76	0.47
21+	6.9	0.3	0.59	0.99

Source: Small-Scale Avian Influenza Saturation Survey (World Bank).

The World Bank survey posed 31 KAPP questions, of which those pertaining to HPAI knowledge were grouped into five categories for the present study: symptoms (7 questions), control and prevention (5 questions), transmission (7 questions), sick fowl treatment (5 questions), and dead fowl disposal (7 questions). For each category, responses were scored by awarding 1 point for each acceptable answer and 0 for each wrong answer, then scores were summed by category and by household.

KAPP variables were cross-tabulated over education in years, income per capita quartiles, and past history of HPAI in the flock, and a chi-square test for independence of each KAPP variable across categories within education, income, and past-HPAI variables was produced. Then, the proportional odds model was estimated using ordinal logistic regression analysis to determine the likelihood of greater knowledge or attitude or best practices (on a scale of 0–5, where 0 = unaware and 5 = fully knowledgeable) in each of the five KAPP categories affected by socio-demographic and economic factors. An ordinary least-squares regression was used to determine the factors that affect risk perception in the rural households.

Results and Discussion

Survey results indicated that the most common method for disposing of a dead bird was burial (88 percent), followed by burning (26 percent), but some disposed of them in rivers or ponds (14 percent). Only a small percentage of households self-consumed or gifted dead fowl (0.3 percent) or sold dead fowl (0.03 percent) or their droppings (0.17 percent). More than 80 percent of respondents indicated that they took no action to treat or dispose of sick birds. Sick birds commonly were sold (19 percent) or slaughtered for food or gifts (14 percent). Some 18 percent of the households gave antibiotics to sick birds (without knowing which disease infected the flocks), and some 13 percent vaccinated sick birds.

The most common practices for keeping birds (80 percent of respondents) were free-ranging during the daytime and separated from the house at night (Table 2).

Table 2. Practices associated with small-scale household poultry production

Poultry-Production Practice	Number of Households	Percent
Daytime		
Free-ranging	2,404	79.79
Fenced	271	8.99
Nighttime		
Inside house	335	11.12
Separate from house	2,285	75.84
Outside (free-ranging)	393	13.04

The most common understanding of HPAI symptoms was the sudden or unexpected death of healthy birds (77 percent) (Table 3). In terms of HPAI control and prevention measures, 26 percent reported washing cages or pens, 18 percent reported spraying cages with disinfectant, 89 percent reported washing their hands with soap and water immediately after touching sick or dead poultry, and 79 percent reported washing their hands after preparing raw poultry.

Table 3. Household knowledge of HPAI symptoms, control and prevention measures, and transmission

Knowledge About Avian flu	Number of households responded correctly	Percent
Bird symptoms		
Sudden or unexpected deaths	2,329	77.3
Swollen or bluish comb	566	18.79
Little food intake	54	1.79
Difficulty breathing	63	2.09
Diarrhea	34	1.13
Ruffled feathers	35	1.16
No answer	112	3.71

Control and prevention	Yes	Percent	No	Percent
Report sick bird	1,554	51.58	1,459	48.42
Wash hands with soap and water immediately after touching sick or dead poultry	2,672	88.68	341	11.32
Wash hands with soap and water immediately after preparing raw poultry	2,379	78.96	634	21.04
Wash the cage or pen	777	25.79	2,236	74.21
Spray disinfectant in cage or pen	541	17.96	2,472	82.04
Transmission				
Touch sick or dead poultry with bare hands	853	28.31	2,160	71.69
Children in household play with or touch sick or dead poultry with bare hands	363	12.05	2,650	87.95
Prepare sick or dead poultry for a meal	401	13.31	2,612	86.69
Prepare raw poultry and other foods with the same cutting boards and utensils without washing	166	5.51	2,847	94.49
Eat poultry that is pink in the middle	195	6.47	2,818	93.53
Eat eggs with a runny yolk	1,622	53.83	1,391	46.17
If your neighbor told you that there are sick poultry in the village or nearby (while your birds are still healthy), it is very likely and somewhat likely that your birds will get sick	2,430	80.65		

The odds ratios for the five KAPP models were estimated with ordinal-dependent variables (Table 4). A coefficient with an odds ratio less than 1 implies that the role of the coefficient in increasing the likelihood of more knowledge is less successful than the ones that had odds ratios of 1 or more. Important determinants that affect the likelihood of households having more knowledge about HPAI symptoms (model 1) are education of the household head, household size, income per capita, and past knowledge about HPAI symptoms, but free-range practices reduce the odds ratio of a household having more knowledge about HPAI symptoms, as expected.

Important determinants that affect the likelihood of a head of household having more knowledge about sick fowl treatment are education and income per capita quartile; age and past knowledge about HPAI symptoms lowered the odds ratio of the likelihood of households having more knowledge about transmission. Important determinants of the likelihood of head of household having more knowledge about control and prevention are whether the birds are free-ranging, age,

whether the household owns other animals, and whether the household has the correct knowledge about transmission.

Table 4. Highest likelihood results showing odd ratios for KAPP models 1–5

Variable	Model 1: HPAI Symptoms	Model 2: Sick Fowl Treatment	Model 3: HPAI Control and Prevention	Model 4: HPAI Transmission	Model 5: Dead Fowl Disposal
Free-ranging poultry , 1 if free range, 0 otherwise	0.814*	1.165	1.851***	1.195*	1.018
	(0.078)	(0.105)	(0.162)	(0.100)	(0.099)
Gender of household head (female)	1.236	0.826	0.853	1.347	0.843
	(0.227)	(0.139)	(0.088)	(0.214)	(0.154)
Age of household head	0.989**	0.992**	0.994*	0.977***	0.996
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Household size	1.110***	1.016	0.970	1.111***	1.045
	(0.030)	(0.025)	(0.022)	(0.026)	(0.028)
Education of household head, in years	1.052***	1.062***	1.044***	1.048***	1.019
	(0.012)	(0.011)	(0.010)	(0.011)	(0.012)
Number of occupations of household head	0.965	0.940		0.802***	0.827**
	(0.064)	(0.057)		(0.046)	(0.055)
Marital status	1.315	0.777		1.192	0.981
	(0.215)	(0.117)		(0.168)	(0.159)
Current poultry flock	1.000			1.000	1.000
	(0.000)			(0.000)	(0.000)
Household owns other animals (d, 1 if household own other animals, 0 otherwise)	0.839		1.228*	0.955	1.181
	(0.081)		(0.100)	(0.0786)	(0.113)
Number of types of poultry kept in household	1.048	1.043		0.968	1.044
	(0.037)	(0.034)		(0.0295)	(0.037)
Past knowledge about HPAI symptoms (d, 1 with past knowledge, 0 otherwise)	1.460***	0.846*	0.956	1.128	0.621***
	(0.114)	(0.061)	(0.064)	(0.0761)	(0.049)
Income per capita quartile	1.133***	1.082*	0.989	1.131***	1.086*
	(0.042)	(0.037)	(0.031)	(0.0361)	(0.0400)
Dummy if household had earnings from poultry	1.103	0.901		0.902	0.922
	(0.099)	(0.075)		(0.0699)	(0.082)
KAPP on HPAI symptoms		1.119			1.161*
		(0.068)			(0.075)
KAPP on HPAI transmission			1.095***		1.091**
			(0.027)		(0.031)
No. of observations	2,971	2,971	2,971	2,971	2,971
Pseudo R^2	0.032	0.015	0.014	0.025	0.017
Log likelihood	–2,620.0	–3,459.5	–4,525.1	–4527.7	–2,773.4
Chi-square	174.2	106.8	129.1	230.4	96.94
LR test of proportionality of odds across response categories	29.34	107.38***	169.50***	71.56	51.06

Exponentiated coefficients; Standard errors in parentheses. d = dummy variable, LR = Likelihood Ratio test.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Important determinants of high knowledge of transmission modes by the head of household include whether the birds were free-ranging; age, level of education, and number of occupations; and the household size and per capita income. Regardless of whether they have free-ranging flocks, households have the same odds of having high knowledge about HPAI transmission. The likelihood of head of household having more knowledge about dead fowl disposal was influenced by per capita income and correct knowledge of HPAI symptoms and transmission modes. In contrast, a past history of HPAI yielded a low odds ratio, which implies that past history is less likely to improve the likelihood that head of household will correctly apply dead fowl disposal practices.

Conclusions

Information and education campaigns are popular policy tools for increasing public awareness. Few studies have addressed how well campaigns communicate their information to the targeted audiences. This study explored how KAPP toward HPAI among small-scale poultry producers in rural Indonesia resulted in the correct perceptions of HPAI risk and behavior. Results indicate that the gender and marital status of the household head, current flock size, number of poultry types held by the household, whether animals other than poultry are owned, and an indicator of a household earnings from poultry were not statistically significant.

Overall, rural households and poultry producers in Jogyakarta had limited knowledge about HPAI symptoms and variable knowledge about HPAI transmission modes and HPAI control and prevention measures. To effectively communicate with the rural communities and poor poultry producers, awareness campaigns should incorporate training materials appropriate to the sociodemographic and economic characteristics of the target audience.

References

Fielding, R., W. W. T. Lam, E. Y. Y. Ho, T. H. Lam, A. J. Hedley, and G. M. Leung. 2005. Avian influenza risk perception, Hong Kong. *Emerging Infectious Diseases* 11 (5): 677–682.

Maton, T., P. Butraporn, J. Kaewkangwal, and W. Fungladda. 2007. Avian influenza protection knowledge, awareness, and behaviors in a high-risk population in Suphan Buri province, Thailand. *Southeast Asian Journal of Tropical Medicine and Public Health* 38 (3): 560–568.

Di Giuseppe, G., R. Abbate, L. Albano, P. Marinelli, and I. F. Angelillo. 2008. A survey of knowledge, attitudes, and practices towards avian influenza in an adult population of Italy. *BMC Infectious Diseases* 8: 36. http://www.biomedcentral.com/1471-2334/8/36.

Leslie T., J. Billaud, J. Mofleh, L. Mustafa, and S. Yingst. 2008. Knowledge, attitudes, and practices regarding avian influenza (H5N1), Afghanistan. *Emerging Infectious Diseases* 14 (9): 1459–1461.

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