KNOWLEDGE, ATTITUDES AND PRACTICES (KAP) REGARDING INFLUENZA A (H1N1) AMONG A POPULATION LIVING ALONG THAI-MYANMAR BORDER, RATCHABURI PROVINCE, THAILAND

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Abstract. The 2009 influenza A (H1N1) outbreaks in Thailand was successfully controlled, partly through the use of electronic media to educate the public. People living along the Thai-Myanmar border may have less access to this electronic media or might have health beliefs that differ from the general Thai population with potential to impact an influenza outbreak. We conducted a survey to assess the knowledge, attitudes and practices regarding influenza among people living along the Thai-Myanmar boder in Ratchaburi Province, Thailand. Of 110 households surveyed, 96% were Karen ethnicity. Greater than 50% were uneducated and most had a low family income. Knowledge about influenza was low. Attitudes regarding infection were mostly negative among the elderly in this area. Practices regarding influenza were moderately good. Education level was associated with knowledge and practice. Income level and wealth indicators were associated with knowledge and having a radio or TV was associated with good practices. Preventive behavior was associated with good knowledge but not with attitudes about influenza. Health education campaigns are needed in these communities to help people adopt desired changes in behavior to improve personal hygiene.

Keywords: Influenza, knowledge, attitude, practice, Thai- Myanmar, preventive behavior

INTRODUCTION

The 2009 influenza A (H1N1) global epidemic began in March 2009 in Mexico, one of the earliest countries affected (Fraser *et al*, 2009). In June 2009, the World Health Organization (WHO) declared the outbreak of a pandemic due to a new strain of swine-origin H1N1 called "swine flu" by the public media (WHO, 2010a). Approximately 18,500 laboratory-confirmed deaths caused by the 2009 influenza A (H1N1) pandemic were reported worldwide between April 2009 and August 2010 when the World Health

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Organization declared the influenza A (H1N1) pandemic over (WHO, 2010b). Respiratory and cardiovascular mortality associated with the 2009 influenza A (H1N1) pandemic were up to 15 times higher than the reported figure (Dawood, 2012). More than half of all unassessed deaths were thought to come from Africa and Southeast Asia countries (Dawood, 2012). Public health effort to prevent or control influenza outbreaks, in these regions need to be made (Dawood *et al*, 2012).

The common symptoms of influenza A (H1N1) are similar to those of seasonal influenza A: fever, cough, sore throat, runny nose, body aches and headache (Fajardo-Dolci *et al*, 2012). Influenza is contracted mainly though respiratory droplets and fomites (Bautista *et al*, 2010). Most patients recover within a week, while a small number of patients may develop severe complications such as pneumonia and respiratory failure which can cause death among influenza A (H1N1) patients (Viasus *et al*, 2012). People with chronic diseases, such as obesity, chronic obstructive pulmonary disease (COPD), pregnant women, children and elderly people are at high risk for getting the infection (Bautista *et al*, 2010).

The first confirmed influenza A (H1N1) 2009 case in Thailand was diagnosed on May 12, 2009, in a student who had returned home from abroad (Iamsirithaworn *et al*, 2011). After that there were a number of outbreaks among primary and secondary school children, university students, workers in Bangkok and then to 60 provinces, in particular those in the northern and north-eastern regions of Thailand. The total number of H1N1 laboratory confirmed cases was about 8% of the total population of 65 million and the estimated number of influenza-like illnesses and other influenza subtypes reached 30% of the total population. About 350 deaths were reported during three documented influenza A (H1N1) outbreaks between May 2009 and November 2010, giving an average case fatality rate of 0.16% (Iamsirithaworn *et al*, 2011). Influenza A (H1N1) outbreaks were reported for specific communities and settings, such as military camps, hospitals, prisons, companies, factories and childcare centers (Champunot *et al*, 2010; Karnjanapiboonwong *et al*, 2010; Vatthanasak *et al*, 2010; Lerdsamran *et al*, 2011). In Ratchaburi, a province along the western border of Thailand, the incidence of confirmed influenza A (H1N1) infection was 50 per 100,000 population in 2009 and 15 per 100,000 population in 2010. The attack rate for influenza A (H1N1) infection in Ratchaburi Province was relatively small compared to some cities in central, northern and northeastern Thailand. However, the attack rate in Ratchaburi was one of the highest in the western provinces in Thailand (unpublish data, Bureau of Epidemiology, Ministry of Public Health Thailand). During the peak period between April and August 2009, 16 confirmed cases were reported from the study district, Suan Phung (4% of all confirmed cases from Ratchaburi Province during the same time period) (SDC49-Ratchburi, 2009).

Understanding the knowledge, attitudes and practices (KAP) of populations in this area can help for designing adequate control, education and prevention programs (Mayxay *et al*, 2013). Good knowledge, attitudes and practices among the public are important for successful control programs and outbreak prevention. In Thailand there is only one published study of public KAP regarding influenza among patients at a hospital in Bangkok but in no other settings (Suk-

prasert *et al*, 2009). We studied the KAP regarding influenza A (H1N1) among the local population living in Ratchaburi Province along the Thai-Myanmar border.

MATERIALS AND METHODS

Study duration and location

The study was conducted between May and August 2010, during the third wave of the Thailand (H1H1) influenza pandemic. There was no record of H1N1 influenza outbreak in the area of study. The Rajanagarindra Tropical Disease International Center (RTIC) situated in Ban Huai Muang, Tanaosri Subdistrict, Suan Phueng District, Ratchaburi Province, Thailand was selected as the main study site. The RTIC was established as a field station by the Faculty of Tropical Medicine, Mahidol University in 2000. The center is integrated with and has become a part of the local community through giving free health service, including malaria diagnosis and free medications, such as antipyretics, antimalarials and antihelminthics. This survey was conducted among individuals who lived in the seven hamlets surrounding the RTIC in Suan Phueng District: Pong Haeng, Huay Namnak, Wang Kho, Huay Pak, Huay Krawan, Nong Tadung and Phu Rakum (Fig 1). The population size of the 7 hamlets is about 3,000, comprised of 532 households. The study area represents communities along the Thai border where the majority of the population is non-Thai, has a small income, a low level of education and poor access to hospitals or health centers. This population is at high risk for hygiene related disease outbreak.

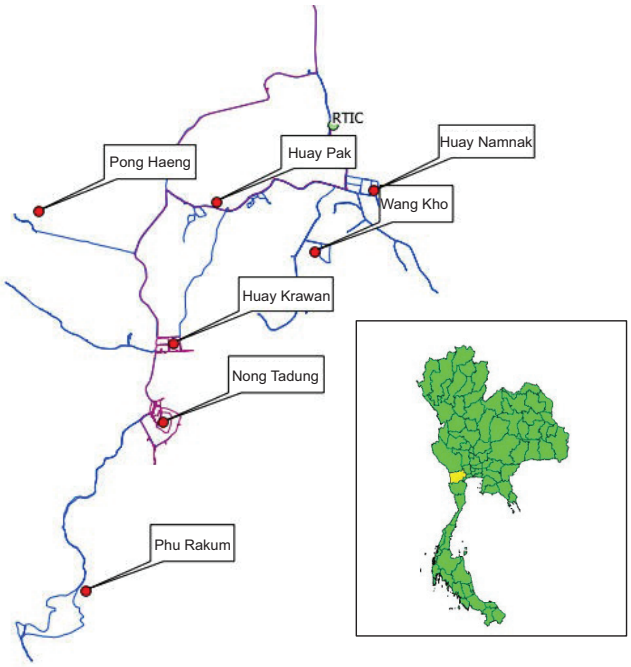

Fig 1–The study sites in seven hamlets in Suan Phueng, Ratchaburi Province. The inset shows the location of Ratchaburi Province on the map of Thailand.

Sampling procedure and questionnaire survey

The minimal sample size required was 96. This was based on a 95% confidence level, a ±10% acceptable margin of error and a response rate of 50%. The questionnaire was in basic Thai and administered to representatives of randomly selected households in face to face interviews. The representative was often the head of the household (or the second most responsible household members in the absence of the head). Respondents needed to be at least 18 years old, willing to participate in the study and give written consent before being interviewed. The interviewers were trained and certified before the survey. If the respondent was unable to communicate in Thai, a translater was provided who could communicate in the Karen language.

The questionnaire was comprised sixty questions in four parts: 1) general characteristics including gender, employment and marital status, race, religion, education, family income, possessions owned (*eg*, TV, radio, motorcycle, car) (12 questions); 2) assessment of knowledge, including their experiences and understanding about influenza A (H1N1) transmission, signs, symptoms and prevention (28 questions); 3) assessment of attitudes about influenza A (H1N1) using a Likert scale (10 questions); 4) assessment of practices to prevent influenza A (H1N1) at the personal, family and community levels (10 questions). Total possible scores for knowledge, attitudes and practices were 28, 50 and 10 points, respectively. On the knowledge and practices sections, the participants answered multiple choice questions related to their experiences with influenza A (H1N1) infection, knowledge about transmission routes, sources of information, recognition of symptoms and preventive behavior. For each question, a score of "1" was given for a correct response and a score of "O" was given for an incorrect or missing response. In the attitudes section, to obviate any acquiescence bias 5 positive and 5 negative statements were listed in that section (Losby and Wetmore, 2012). A five-point Likert scale was used, with 1 = strongly agree, 2 = somewhat agree, 3 = neutral/no opinion, 4 = somewhat disagree and 5 = strongly disagree with positive statements. A reverse scale was used for negative statements. A higher score on the attitudes section indicates a greater concern about influenza A (H1N1).

The overall reliability of questionnaire as measured by the Cronbach's alpha coefficient was 0.80, which indicates an acceptable level of internal consistency among the questions (Reynaldo and Santos, 1999; Gliem and Gliem, 2003; Tavakol and Dennick, 2011).

Ethical issues

All the subjects were informed about the study objective and risks; confidentiality was maintained in the study. Those who were willing to participate gave written informed consent. Ethical approval for the study was obtained from the Ethics Committee of the Faculty of Tropical Medicine, Mahidol University.

Data analysis

Descriptive statistics were used for characteristics of the 110 participants. Significant differences between the two groups were determined using the chi-square and *t*-test for categorical and continuous data, respectively. Correlation between two parameters was estimated with the Pearson's correlation. All analyses were performed using PASW Statistics 18, WinWrap Basic Polar Engineering and Consulting, Chicago, IL.

RESULTS

Table 1 shows the characteristics of the 110 participants. The mean age of participants was 35.8 years old (the Standard Deviation or SD of 13.8) with a male to female ratio of 1:1. The majority of the participants (96%, 105/110) were Karen. Most participants (78%, 86/110) worked in agriculture, animal farming or were self-employed. More than half the participants (61/110) were uneducated and earned a relatively low income of less than USD100 per month.

The mean scores for knowledge, attitudes and practices were compared among the different groups (Table 1). The knowledge and practice scores varied significantly by religion and education and income levels. People with a higher education level tended to have a better knowledge about influenza A (H1N1) and better

Table 1
Characteristics of the studied population (N=110) and knowledge (K), attitude (A) and practice (P) levels.

Characteristics	Number (%)	Mean and p-value		
		Knowledge	Attitude	Practice
Gender				
Male	57 (52)	10.94	33.45	6.14
Female	53 (48)	11.34	32.17	6.06
	p-value	0.75	0.14	0.73
Age (year)				
18-35	62 (56)	12.31	31.97	6.29
36-50	31 (28)	9.52	33.10	5.68
51-75	17 (16)	9.82	35.23	6.18
	p-value	0.09	0.03*	0.09
Employment status				
Working	86 (78)	11.07	32.39	6.05
Not working	24 (22)	11.37	34.21	6.29
	p-value	0.84	0.08	0.41
Marital status				
Single	18 (16)	11.08	32.74	6.01
Married	86 (78)	12.39	32.00	6.50
Divorced/ widowed	6 (6)	8.17	35.83	6.17
	p-value	0.37	0.20	0.34
Race				
Thai	5 (4)	18.20	33.00	6.80
Karen	105 (96)	10.80	32.78	6.07
	p-value	0.01*	0.92	0.21
Religion				
Buddhist	64 (58)	12.87	32.00	6.16
Christian	43 (39)	9.09	33.88	6.07
Others	3 (3)	3.33	34.00	5.33
	p-value	<0.01*	0.10	0.54
Education level				
Illiterate	61 (56	8.11	33.23	5.82
Primary school	29 (26)	13.59	33.03	6.45
High school or higher	20 (18)	16.80	31.10	6.45
	p-value	<0.01*	0.18	0.03*
Family income/month (US dollar)[a]				
10-100	59 (54)	8.12	33.59	5.85
> 100-250	30 (27)	13.73	32.73	6.47
> 250-400	21 (19)	15.90	30.62	6.29
	p-value	<0.01*	0.03*	0.07
Radio/TV (either or both)				
Yes	67 (61	13.07	32.45	5.48
No	43 (39	8.12	33.32	5.21
	p-value	<0.01*	0.32	<0.01*
Motorcycle/car (either or both)				
Yes	77 (70	13.05	32.78	6.23
No	33 (30	6.67	32.82	5.79
	p-value	<0.01*	0.97	0.09

*Statistically significant; [a]USD 1 ≃ THB 32.

Table 2
Total, mean (SD) and median (range) scores for the knowledge, attitudes practices assessment.

Measures	Total score	Mean (SD)	Median (range)	% samples within mean±SD (person)
Knowledge	28	11.14 (6.4)	12 (1-22)	60.0 (66)
Attitudes	50	32.79 (4.5)	33 (22-50)	74.5 (82)
Practices	10	6.1 (1.3)	6 (3-9)	77.3 (85)

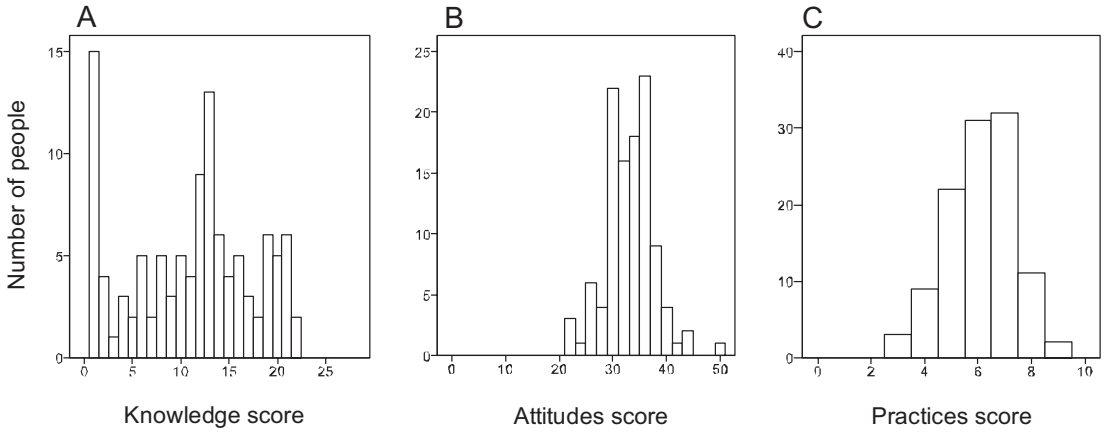

Fig 2–The number of people who answered the specific number of questions correctly.

practices about infection. Households with a higher income or with more possessions tended to have a better knowledge of influenza A (H1N1). Households that had a radio or TV would be expected to have a better knowledge and practices because of availability of better sources of information about influenza A (H1N1). Buddhists tended to have a better knowledge about influenza than other religions. It is not clear why this was evident. In general, people in this community did not appear to be very religious; there were no frequent religious gatherings organized in the community. It is common practice in some Buddhist countries to register those with an unknown religion as a Buddhist making this demographic information unreliable. Further investigation is needed to clarify this finding. The lowest income group and those aged >51 years were the most concerned about influenza A H1N1 infection.

Table 2 shows the knowledge, attitudes and practices scores for the studied subjects. The scores for attitudes and practices were normally distributed but the score for knowledge was deviated from normal. The knowledge score correlated with the practice score (r=0.22, p=0.02), indicating better knowledge was associated with better practices for preventing influenza A (H1N1). There was no significant correlation between the attitude score and the knowledge score (p=0.19) or between the attitude score and the practice score (p=0.74).

Assessment of knowledge level shows a large number of people had poor knowledge about influenza. Fourteen percent of participants (n = 15) had a knowledge score of 1 out of 28 points (Fig 2A). Twenty-four percent of respondents (n = 26) had never heard of the influenza A (H1N1); 73% (n = 80) did not know the transmission route or that it was called "swine flu" and 32% (n = 35) thought pigs were involved in transmission. Only 55% of participants (n=60) could differentiate the symptoms of influenza A (H1N1) from Chikungunya (highly prevalent in the area at the time of the study).

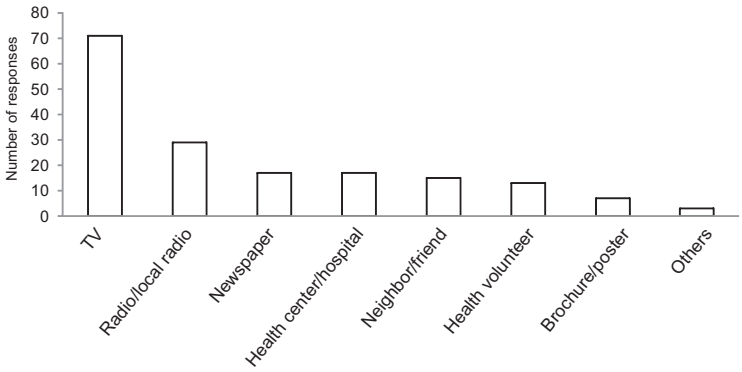

Fig 3–Sources of information about influenza A (H1N1) by number of responses.

People in the lowest income group and the elderly were more frightened of the influenza A (H1N1) infection (Fig 2B). There was a lot of sharing of personal belongings, such as drinking glasses, spoons, towels, especially between parents and children (87%). Fifty-eight percent of the population did not exercise but >82% of households had at least one family member with some congenital or underlying disease.

Where more than one answer may be selected, there were 172 responses on the main source of information about the influenza A (H1N1). The distribution of perception from media is shown in Fig 3. Forty-one percent of all the answers showed that TV was the main source of information while radio/local radio came second with 17% of all responses. Information through newspaper, health center/hospital, neighbor/friend, health volunteer and brochure/poster took place between 4% to 10%.

DISCUSSION

This was the study of KAP regarding influenza A (H1N1) performed in a Thai/Myanmar border community where the majority of the population was non-Thai. The study population was typical of the many communities along the Thai-Myanmar border. This population was likely to receive the least health education by the government. Nearly 25% of the studied population had not heard about influenza A (H1N1). There was a lack of knowledge about influenza A (H1N1) including disease transmission, common symptoms and self-protection practices. These observations are consistent with a previous study of KAP about influenza conducted among outpatients and their relatives during a visit to a hospital in Bangkok (Sukprasert *et al*, 2009). Similar to previous studies, people with higher education level had a significantly better knowledge about influenza A (H1N1) ($p < 0.01$) (Marshall *et al*, 2009; Sukprasert *et al*, 2009; Lin *et al*, 2011; Latiff *et al*, 2012). Comparison of knowledge in different ethnic groups was not possible since the majority of the studied population was Karen. The significant difference in knowledge level by religious group is unclear since there were no strict religious

practices in the studied population.

The study found a positive correlation between knowledge and practice scores. But the attitude score did not correlate with either the knowledge or the practice scores. Emotional distress about influenza was significantly greater in the lowest income group and among the elderly. Congenital or underlying diseases were common (82%) in the studied households and basic self-protection practices were minimal. More than 80% of participants shared personal belongings with their parents or children and more than half the studied population had never exercised.

The results of this study provide information for health sector authorities for developing strategies and health education campaigns to prevent future influenza outbreaks. The positive correlation between the knowledge and practices scores suggests better practices for influenza A (H1N1) prevention can be achieved by educating people, which should help them to adopt desired changes in behavior and promote better personal hygiene. Television and radio provide good modes of transmitting this information to the community. Health educational programs should be offered in languages appropriate to the audience. The lack of correlation between attitudes scores and knowledge and practices scores has been seen previously (Lin *et al*, 2011; Latiff *et al*, 2012). Long term interventional strategies and gaining the populations' trust in health sector authorities may influence perceptions regarding risk of contracting influenza. This may have an important affect on population attitudes and practices, particularly during a pandemic.

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