

REFERENCES

1. Shieh W, Edwards C, Levett P, Zaki S, 2006. Leptospirosis. Guerrant R, Walker D, Weller P, eds. *Tropical Infectious Diseases: Principles, Pathogens & Practice*. Philadelphia: Churchill Livingstone, 511--518.
2. Levett P, 2001. Leptospirosis. *Clin Microbiol Rev* 14: 296--326.
3. Bharti A, Nally J, Ricaldi J, Matthias M, Diaz M, Lovett M, Levett P, Gilman R, Willig M, Gotuzzo E, Vinetz J, 2003. Leptospirosis: a zoonotic disease of global importance. *Lancet Infect Dis* 3: 757--771.
4. Terry J, Trent M, Bartlett M, 2000. A cluster of leptospirosis among abattoir workers. *Commun Dis Intell* 24: 158--160.
5. Barcellos C, Sabroza P, 2001. The place behind the case: leptospirosis risks and associated environmental conditions in a flood-related outbreak in Rio de Janeiro. *Cad Saude Publica* 17 Suppl: 59--67.
6. Gaynor K, Katz AR, Park SY, Nakata M, Clark TA, Effler PV, 2007. Leptospirosis on Oahu: an outbreak associated with flooding of a university campus. *Am J Trop Med Hyg* 76: 882--885.
7. Johnson M, Smith H, Joeph P, Gilman R, Bautista C, Campos K, Cespedes M, Klatsky P, Vidal C, Terry H, Calderon M, Coral C, Cabrera L, Parmar P, Vinetz J, 2004. Environmental exposure and leptospirosis, Peru. *Emerg Infect Dis* 10: 1016--1022.
8. Chazée L, 2002. *The peoples of Laos: rural and ethnic diversities*. Bangkok: White Lotus Press.
9. Levy P, Lemeshow S, 1999. *Sampling of populations: methods and applications*. New York: John Wiley & Sons.
10. World Health Organization, 2003. *Human leptospirosis: guidance for diagnosis,*

surveillance and control: World Health Organization.

11. Plank R, Dean D, 2000. Overview of the epidemiology, microbiology, and pathogenesis of *Leptospira* spp. in humans. *Microbes Infect* 2: 1265--1276.
12. Suzuki K, Nakamura S, Watanabe H, 1997. A fatal case of *Leptospira autumnalis* infection in Lao PDR. *Southeast Asian J Trop Med Public Health* 28: 436--437.
13. Bounlu K, Insisiengmay S, Vanthanouvong K, 1998. Acute jaundice in Vientiane, Lao People's Democratic Republic. *Clin Infect Dis* 27: 717--721.
14. Laras K, Cao B, Bounlu K, Nguyen T, Olson J, Thongchanh S, Tran N, Hoang K, Punjabi N, Ha B, Ung S, Insisiengmay S, Watts D, Beecham H, Corwin A, 2002. The importance of leptospirosis in Southeast Asia. *Am J Trop Med Hyg* 67: 278--286.
15. Seng H, Sok T, Tangkanakul W, Petkanchanapong W, Kositanont U, Sareth H, Hor B, Jiraphongsa C, 2007. Leptospirosis in Takeo Province, Kingdom of Cambodia, 2003. *J Med Assoc Thai* 90: 546--551.
16. Tangkanakul W, Smits H, Jatanasen S, Ashford D, 2005. Leptospirosis: an emerging health problem in Thailand. *Southeast Asian J Trop Med Public Health* 36: 281--288.
17. Van C, Thuy N, San N, Hien T, Baranton G, Perolat P, 1998. Human leptospirosis in the Mekong delta, Viet Nam. *Trans R Soc Trop Med Hyg* 92: 625--628.
18. Phraisuwan P, Whitney E, Tharmaphornpilas P, Guharat S, Thongkamsamut S, Aresagig S, Liangphongphanthu J, Junthima K, Sokampang A, Ashford D, 2002. Leptospirosis: skin wounds and control strategies, Thailand, 1999. *Emerg Infect Dis* 8: 1455--1459.
19. Wuthiekanun V, Sirisukkarn N, Daengsupa P, Sakaraserane P, Sangkakam A, Chierakul W, Smythe LD, Symonds ML, Dohnt MF, Slack AT, Day NP, Peacock SJ, 2007. Clinical diagnosis and geographic distribution of leptospirosis, Thailand. *Emerg*

Infect Dis 13: 124--126.

20. Phuong HL, de Vries PJ, Nga TT, Giao PT, Hung le Q, Binh TQ, Nam NV, Nagelkerke N, Kager PA, 2006. Dengue as a cause of acute undifferentiated fever in Vietnam. *BMC Infect Dis* 6: 123.
21. Suttinont C, Losuwanaluk K, Niwatayakul K, Hoontrakul S, Intaranongpai W, Silpasakorn S, Suwancharoen D, Panlar P, Saisongkorh W, Rolain JM, Raoult D, Suputtamongkol Y, 2006. Causes of acute, undifferentiated, febrile illness in rural Thailand: results of a prospective observational study. *Ann Trop Med Parasitol* 100: 363--370.
22. Phongmany S, Rolain JM, Phetsouvanh R, Blacksell SD, Soukkhaseum V, Rasachack B, Phiasakha K, Soukkhaseum S, Frichithavong K, Chu V, Keolouangkhot V, Martinez-Aussel B, Chang K, Darasavath C, Rattanavong O, Sisouphone S, Mayxay M, Vidamaly S, Parola P, Thammavong C, Heuangvongsy M, Syhavong B, Raoult D, White NJ, Newton PN, 2006. Rickettsial infections and fever, Vientiane, Laos. *Emerg Infect Dis* 12: 256--262.
23. Everard C, Hayes R, Fraser-Chanpong G, 1985. A serosurvey for leptospirosis in Trinidad among urban and rural dwellers and persons occupationally at risk. *Trans R Soc Trop Med Hyg* 79: 96--105.
24. Waitkins S, 1986. Leptospirosis as an occupational disease. *Br J Ind Med* 43: 721--725.
25. Bruce M, Sanders E, Leake J, Zaidel O, Bragg S, Aye T, Shutt K, Deseda C, Rigau-Perez J, Tappero J, Perkins B, Spiegel R, Ashford D, 2005. Leptospirosis among patients presenting with dengue-like illness in Puerto Rico. *Acta Trop* 96: 36--46.
26. Ashford D, Kaiser R, Spiegel R, Perkins B, Weyant R, Bragg S, Plikaytis B,

- Jarquín C, De Lóse Reyes J, Amador J, 2000. Asymptomatic infection and risk factors for leptospirosis in Nicaragua. *Am J Trop Med Hyg* 63: 249--254.
27. Murhekar MV, Sugunan AP, Vijayachari P, Sharma S, Sehgal SC, 1998. Risk factors in the transmission of leptospiral infection. *Indian J Med Res* 107: 218--223.
28. Leal-Castellanos CB, García-Suárez R, González-Figueroa E, Fuentes-Allen JL, Escobedo-de la Penal J, 2003. Risk factors and the prevalence of leptospirosis infection in a rural community of Chiapas, Mexico. *Epidemiol Infect* 131: 1149--1156.
29. Karande S, Bhatt M, Kelkar A, Kulkarni M, De A, Varaiya A, 2003. An observational study to detect leptospirosis in Mumbai, India, 2000. *Arch Dis Child* 88: 1070--1075.
30. Sanders E, Rigau-Pérez J, Smits H, Deseda C, Vorndam V, Aye T, Spiegel R, Weyant R, Bragg S, 1999. Increase of leptospirosis in dengue-negative patients after a hurricane in Puerto Rico in 1996 [correction of 1966]. *Am J Trop Med Hyg* 61: 399--404.

Figure 1 Khammouane Province, Lao People's Democratic Republic

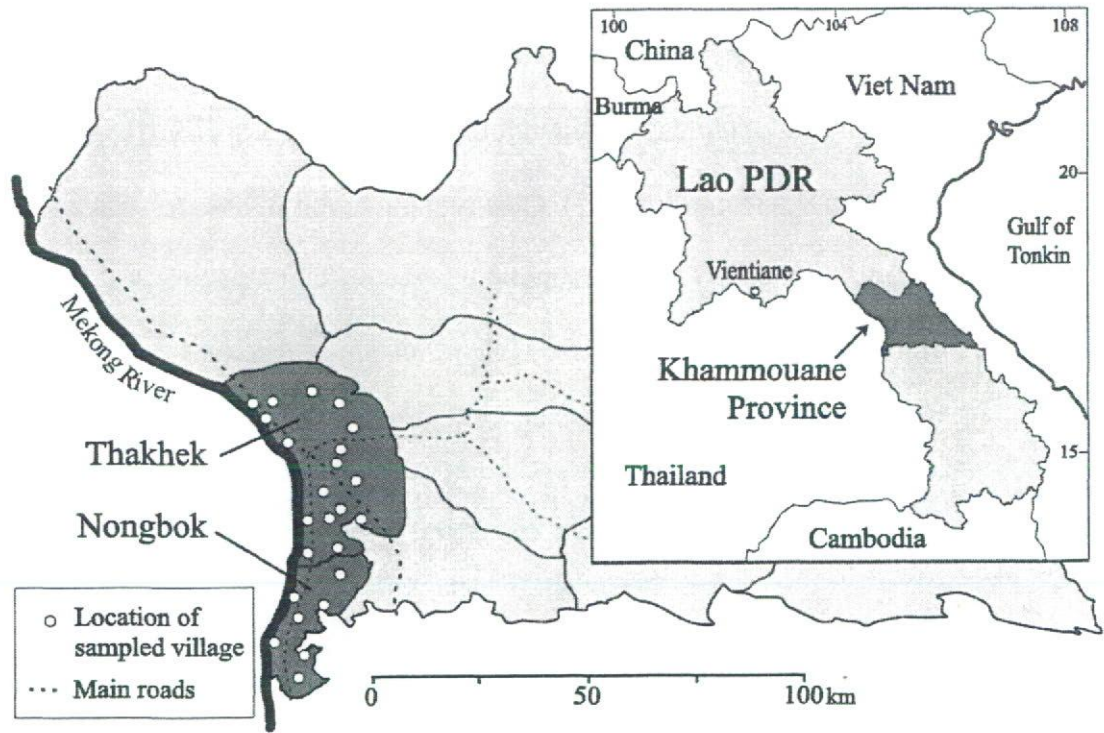


Table 1. Prevalence of *Leptospira* antibodies in Khammouane Province: by sex and age

| Variables | Subjects with antibodies | Total (n) | Prevalence (%) | 95% confidence interval | <i>P</i> * |
|-----------|--------------------------|-----------|----------------|-------------------------|------------|
| Total | 97 | 406 | 23.9 | 19.7--28.0 | |
| Sex | | | | | |
| Male | 57 | 200 | 28.5 | 22.2--34.8 | 0.032 |
| Female | 40 | 206 | 19.4 | 14.0--24.9 | |
| Age | | | | | |
| 15--24 | 21 | 88 | 23.9 | 14.8--32.9 | 0.44 |
| 25--34 | 26 | 85 | 30.6 | 20.6--40.6 | |
| 35--44 | 18 | 97 | 18.6 | 10.7--26.4 | |
| 45--54 | 18 | 73 | 24.7 | 14.5--34.8 | |
| ≥55 | 14 | 63 | 22.2 | 11.7--32.8 | |

* The Pearson chi-squared test was used to calculate *P* values.

Table 2. Univariate results of potential risk factors among persons MAT-positive and MAT-negative for Leptospirosis: odds ratios (OR), 95% confidence intervals (CI), and Wald chi-square *P* values

| Variable | MAT result | | OR (95% CI) | <i>P</i> |
|---------------------------------------|-----------------------------|------------------------------|-------------------|----------|
| | Positive (n=97) n (%) | Negative (n=309) n (%) | | |
| Age groups (years) | | | | |
| 35--44 | 18 (18.6) | 79 (25.6) | 1 (reference) | |
| 15--24 | 21 (21.6) | 67 (21.7) | 1.38 (0.67--2.80) | 0.31 |
| 25--34 | 26 (26.8) | 59 (19.1) | 1.93 (0.96--3.89) | 0.05 |
| 45--54 | 18 (18.6) | 55 (17.8) | 1.44 (0.68--3.02) | 0.34 |
| ≥ 55 | 14 (14.4) | 49 (15.9) | 1.25 (0.57--2.76) | 0.57 |
| Sex | | | | |
| Female | 40 (41.2) | 166 (53.7) | | |
| Male | 57 (58.8) | 143 (46.3) | 1.65 (1.04--2.63) | 0.03 |
| District | | | | |
| Nongbok | 16 (16.5) | 110 (35.6) | | |
| Thakhek | 81 (83.5) | 199 (64.4) | 2.80 (1.54--5.07) | 0.001 |
| Recent flooding on one's own property | 15 (15.5) | 62 (20.1) | 0.73 (0.39--1.35) | 0.3 |
| Individual activities | | | | |
| Collect water from stream | 26 (26.8) | 105 (34.0) | 0.71 (0.43--1.18) | 0.19 |
| Swim in stream | 52 (53.6) | 164 (53.1) | 1.02 (0.65--1.62) | 1.61 |
| Walk barefoot | 85 (87.6) | 238 (77.0) | 2.11 (1.09--4.11) | 0.02 |
| Collect wood in the forest | 77 (79.4) | 209 (67.6) | 1.84 (1.06--3.19) | 0.02 |
| See rodents around house | 94 (96.9) | 288 (93.2) | 2.28 (0.66--7.87) | 0.15 |
| Household animal ownership | | | | |
| Dogs | 55 (56.7) | 180 (58.3) | 0.94 (0.59--1.49) | 0.79 |
| Cattle | 52 (53.6) | 194 (62.8) | 0.68 (0.43--1.09) | 0.1 |
| Pigs | 22 (22.7) | 64 (20.7) | 1.12 (0.65--1.95) | 0.63 |
| Poultry | 75 (77.3) | 271 (87.7) | 0.48 (0.27--0.86) | 0.01 |
| Occupation | | | | |
| Rice field farmer | 86 (88.7) | 280 (90.6) | 0.81 (0.39--1.69) | 0.57 |
| Vegetable / fruit farmer | 24 (24.7) | 102 (33.0) | 0.67 (0.40--1.12) | 0.11 |
| Livestock farmer | 9 (9.3) | 30 (9.7) | 0.95 (0.43--2.08) | 0.90 |
| Fisher | 5 (5.2) | 14 (4.5) | 1.15 (0.40--3.27) | 0.80 |
| Household water source | | | | |
| Well | 91 (93.8) | 272 (88.0) | | |
| River, lake | 6 (6.2) | 37 (12.0) | 0.48 (0.20--1.19) | 0.1 |
| Household sanitary facility | | | | |
| Toilet / latrine | 40 (41.2) | 138 (44.7) | 0.87 (0.55--1.38) | 0.51 |

Table 3. Risk factors for leptospiral infection by multivariate logistic regression

| Variable | Adjusted Odds Ratio (95% confidence interval) | | <i>P</i> |
|---------------------------------------|--|--------------|----------|
| Sex (female = 0, male = 1) | 1.92 | (1.24--2.98) | 0.005 |
| Recent flooding on one's own property | 2.12 | (1.25--3.58) | 0.007 |
| Collect wood in the forest | 1.90 | (1.17--3.09) | 0.012 |
| Reside in Thakhek district | 2.80 | (1.90--4.12) | < 0.001 |
| Keep no poultry at home | 2.22 | (1.10--4.48) | 0.029 |
| See rodents around house | 2.63 | (0.73--9.44) | 0.13 |
| Walk barefoot | 1.58 | (0.72--3.46) | 0.24 |
| Collect water from stream | 0.83 | (0.49--1.41) | 0.48 |
| Swim in stream | 0.86 | (0.50--1.48) | 0.58 |
| sex x flood | 0.26 | (0.11--0.63) | 0.005 |

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Abstract

Cambodia's new health policy emphasizes community participation to improve health services. This study identifies factors facilitating community participation in health center management in rural Cambodia, focusing on roles of local NGOs. A questionnaire survey of 50 local NGOs provided information regarding their understanding of Cambodia's new health system and policies and NGO collaboration with health centers. Eight local NGOs and their partner health centers were selected for further field survey. Using an assessment tool developed by authors, semi-structured interviews were conducted with 35 stakeholders to measure the level of community participation in the management of health centers through two health committees mandated for each health center by the new health policy. Roles and approaches of the eight NGOs were examined. Most of the 50 local NGOs did not understand the new health system and policies well enough to take active roles in promoting community participation. Levels of community participation at the eight health centers varied and were associated with the roles of the partner NGOs. Critical roles of NGOs in facilitating community participation were found to include: nurturing a base for participation, through community organizing and capacity building; encouraging the community to apply their community experiences in health sector; regularly communicating with and monitoring health centers; providing management support to health centers; and linking local actors for health. Long-term

commitment to specific localities and small but crucial financial inputs were found to be advantageous characteristics for NGOs taking such roles. Local NGOs, even those without health expertise and with very limited financial resources, can effectively promote and facilitate community participation in health center management.

Introduction

In Cambodia, community participation was very limited for many years, beginning in 1975, due to the genocidal Khmer Rouge regime, prolonged internal conflicts, and strict government control during the post-conflict period. There were no official channels to involve common people in managing resources in their communities. After the persistent regional conflict ceased in 1998, the first commune elections were held in 2002, and efforts to establish a base for decentralization have been underway (Rusten et al., 2004; Blunt & Turner, 2005).

In 2002, following pilot efforts involving community participation in health, a mechanism for community participation in health center management and activities was officially incorporated in the new national health policy, as one of the key components for the improvement of public health services. The policy mandated two committees for each health center as the mainstays of community participation. A Health Center Management Committee (HCMC) was to make decisions about the health center's services and management. Through another committee, called a Village Health Support Group (VHSG), village health volunteers were to exchange information and provide feedback between community members and the health center. The VHSG was to be composed of one health center chief or staff member and two (ideally one male and one female) community representatives per village. The HCMC was to consist of a health

center chief and two staff members, four to six community representatives selected from VHSG, and one representative per commune council in the health center catchment area. (Inter-Ministerial Committee on Primary Health Care 2002; Ministry of Health 2003).

In some areas, other key persons such as religious leaders and school teachers are included in HCMC as well.

Previous studies of various pilot projects in Cambodia reported positive relationships between functioning community participation through health committees and increases in the volume of service delivery and utilization of health services (Annear, 1999; MEDiCAM, 2000; Ministry of Health, 2000; Feenstra, 2001; Wilkinson, Holloway, & Fallavier, 2001). Beginning in the late 1990s, community participation structures gradually had been established in the majority of health centers, with support from various sources, and the new policy was based on review of those earlier experiences.

However, the functionality and sustainability of the committees has come into question, because such committees have only nominal existence at many health centers (Beloë, 2004; MEDiCAM, 2007). Similar difficulties with community participation through health committees have been observed in other countries (Kahssay & Baum, 1996; Kahssay & Oakley, 1999). The Cambodian Ministry of Health's efforts to activate or re-activate the committees were very limited, due to financial constraints (Ministry of Health, 2004, 2005). Most of the efforts related to local health committees in Cambodia involved international aid agencies or NGOs with intensive financial and technical inputs,

and issues of sustainability are common after such projects phase out.

In such situations, area-focused local NGOs have the potentials to overcome the difficulties in community participation and sustainability, given their long-term commitments to specific localities and communities. However, local NGOs in Cambodia started only in late 1991 (Mysliwicz, 1994; Bennett & Benson, 1995), although from the mid-1990s their numbers rapidly increased (NGO Forum on Cambodia, 2006). It was estimated that about 2,000 organizations were registered with the government as “local NGOs and associations” as of 2004, at the time of this study. However, a 2003 directory of local NGOs in the development sector contains brief profiles of only about 200 local NGOs (Cooperation Committee for Cambodia, 2003). Activities of small scale local NGOs in provinces have not been well known or well recognized due to their isolated activities, often without contact with government agencies or other NGOs, and to the unavailability of detailed documentation of their work.

An NGO network in the health sector, MEDiCAM, was organized in 1989 (Lanjouw Macrae, & Zwi, 1999), however, the members were almost all international NGOs although a limited number of local NGOs around the capital city joined later. Only after 2003 did the network actively seek to include small scale local NGOs in distant provinces (MEDiCAM, 2004). The previous studies of local NGOs and associations in Cambodia (Kao, 1999; Yonekura, 1999; Mansfield, Sarath, & Um, 2001; Richardson, 2001; Kusakabe et al., 2002; Ngin, 2002) have not focused on local NGOs in the health sector. Similarly,

in studies and reviews of factors influencing community participation in health in other countries (Stone, 1992; Woelk, 1992; Sepehri & Pettigrew, 1996; Zakus & Lysack, 1998; Morgan, 2001; Uzochukwu, Akpala, & Onwujekwe, 2004), the role of local NGOs has not been highlighted.

This paper aims first to identify factors that contribute to community participation in health center management through HCMC and VHSG in rural areas of Cambodia, focusing on the roles of local NGOs involved in the process, then to highlight the significance and potential of local NGO involvement for health development in Cambodia.

Methods

The subjects of this research were local NGOs in the health sector, which we defined as: voluntary organizations, established by Cambodians living in Cambodia and with Cambodians living in Cambodia heading the organization and holding its management and decision making power, engaged in various health activities as core activities of their development work. To be included in the study, local NGOs also could not be directly engaged in any specific political party or religious promotion activities on an organizational basis, and could not be parts, subsidiaries or affiliates of government agencies or international NGOs. Hereafter, the word “NGO” indicates local NGOs meeting the above definition and criteria, unless otherwise indicated in the text (e.g. in

discussing “international NGOs”).

First, self-administered questionnaire forms written in Khmer were distributed and collected between December 2003 and April 2004 through the MEDiCAM network. The questions covered each organization’s brief profile, knowledge of the new national health system and policies (including the policy-mandated community participation mechanism at health centers), activities with or regarding health centers, and working relationships with government administrations and with aid and development organizations.

Questionnaires were distributed to 80 NGOs, mostly newly joined members of the MEDiCAM local NGO network or were interested to join, and 50 NGOs from 13 provinces responded. Responses were analyzed using SPSS11.5J. Additional information was collected during the same period through participant observation in monthly meetings of and training sessions for NGOs and during an annual dialogue forum between government agencies and NGOs organized by MEDiCAM. We also interviewed four coordinators of local NGO support programs of international NGOs and network organizations, to discuss the general situation and issues with regard to local NGOs.

From the list of 50 respondents to the questionnaire, eight NGOs in seven provinces were selected for field visits that met all of the following criteria:

- (1) had been in contact with health centers in their working areas for more than three years,
- (2) were able to assess the service delivery situations of their partner health centers,

- (3) had worked more than four years (A criterion intended to ensure some stability of the NGO. A typical NGO project cycle is three years, and some NGOs stop operating after failing in a first project.);
- (4) were working in rural areas; and
- (5) were working in areas in which no large-scale health aid projects were active at the time of survey (a criterion included because the presence of large-scale health aid projects could obscure the roles and impacts of local NGOs in strengthening community participation).

A team of two researchers visited the selected NGOs in their working areas during three weeks between July and August, 2004. We observed the NGO's activities and carried out semi-structured follow-up interviews with the NGO representatives and with staff in charge of their partner health centers, based on the NGO's responses to the initial survey questionnaire. Additional questions were asked regarding the founding of their NGO and the respondents' views regarding the organization and its roles, strengths and concerns as a local NGO. .

In parallel with the field visits to the eight NGOs, in order to assess community participation in health center management through the HCMC and VHSG at their partner health centers, semi-structured individual interviews were conducted with 35 stakeholders of the eight health centers. Those 35 interviewees included health center chiefs and staff members, health volunteers, and local authorities (village chiefs and

commune councilors) who were members of HCMC or VHSG; and NGO workers in charge of the relations with health centers. Each interview lasted approximately 60 to 90 minutes. Each interviewee was informed before the interview that he or she had the right not to answer any or all questions and that their names, individual or organizational, would be kept anonymous.

An assessment tool was developed, based on the framework by Rifkin et al. (1988). We modified that framework and added assessment items and indicators we considered necessary to suit our research objectives and the situations and issues around the two committees in rural Cambodia (Table 1). Pre-tests were conducted with some experienced local NGO workers who were familiar with other NGOs. Comments from international NGO workers, NGO networking coordinators, and Ministry of Health personnel were also incorporated in the revision of the tool. Five major aspects of community participation through the health committees were covered by the tool: 1) representation of community representatives, 2) commitment and resource mobilization, 3) decision making, 4) management, and 5) accountability between the community representatives and the community. Under each major aspect, three indicators were developed. Each indicator was scored on a separate, pre-established 1 to 5 scale by the researchers, based on the interviewees' responses. This tool was intended to measure the level of HCMC only; however, it was used for HCMC and VHSG as well, because the meetings of the two committees, which were supposed to be held separately, were in fact

held jointly at four of the eight health centers studied. Although in joint cases, interviewees were asked to reply basically with regards to the HCMC, it was difficult or impossible to separate the functions of the two committees. In separate cases, interviewees were able to provide information specifically with regard to the HCMC.

Results

Limited knowledge of local NGOs regarding health system and policies

Most of the 50 local NGOs that responded to the initial questionnaire survey did not understand the new health system and policies well enough to take active roles in promoting community participation. The respondents had insufficient understanding of the new national health system and policies, of potential collaboration with health centers, and of policy-mandated mechanisms for community participation mechanism at health centers, regardless of the length of their organizational history or the size of the organization, as shown in Table 2. The respondents were mostly MEDiCAM affiliated NGOs, and we could assume that other NGOs might have had even less knowledge of these matters than those included in the study. Key health policies and guidelines were not widely understood, which limited their collaboration with health centers in their working areas. Although some knew that health committees, HCMC and VHSG, had

been created in the local health center, few NGOs had observed or been involved in meetings of those committees. Many NGOs hesitated to become involved in the committees, and especially in the HCMC. NGOs without technical expertise in health considered that there was no space for NGOs without health professionals to get involved.

The NGOs responding to the questionnaire survey were active in providing health education to communities and in training health volunteers. Their volunteers, however, were not necessarily linked to the newly created mechanisms of community participation at health centers, because many NGOs did not know the mechanisms. Many NGOs had practical contact with health centers for implementation of specific national programs such as HIV/AIDS and tuberculosis control, because of the availability of donor funds. The NGOs' budgetary and material supports to health centers as well as provision of clinical services were very minimal.

Levels of community participation at the selected health centers

Differences in the levels of community participation in health center management through HCMC/VHSG were observed among the eight health centers, as shown in Table 3. Scores for three indicators were summed up under each major aspect and totaled. The eight health centers were named as HC-A to HC-H, in order of descending total scores (i.e., HC-A had the highest total score).