GENDER, MOSQUITOS AND MALARIA: IMPLICATIONS FOR COMMUNITY DEVELOPMENT PROGRAMS IN LAPUTTA, MYANMAR

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Abstract. This paper examines the gender roles linked to division of labor and potential exposure to mosquitos and malaria prevention activities. A "Human Development Initiative" (HDI) Project has been launched in Laputta, a mangrove delta region of Myanmar assisted by United Nations Development Program since 1994. The project aims to improve rural community access to primary health care and provide micro-credit programs, income generation schemes, and educational opportunities as a basis for community empowerment. Women and children of low-income households are the target beneficiaries. Prior to self-care training program and distribution of self-care manuals, altogether 20 focus group discussions (separately assigned to men and women) were conducted in eight study villages between January to February 2000. The primary vector for malaria in study area is *Anopheles sundaicus.* Rural women were prone to malaria due to exposure to mosquitos within the peak biting period at night because of their gender assigned roles. Both men and women perceived that mosquitos commonly bite before midnight, more at dusk. Lack of awareness of correlation between mosquitos and malaria together with lack of affordability enhance either non-use or shared use of bed-nets at home. Rural women did not consider destruction of breeding places of mosquitos as their major concern. Thus, it is essential for program planners to motivate local women for more active participation in vector control measures within and beyond their households in the context of community development programs.

INTRODUCTION

Malaria is the major public health threat in Myanmar according to National Health Plan (1996-2001) (Ministry of Health, 1996) with 568,000 clinical cases (in-patients and out-patients) attending government health facilities in 1997 (Department of Health, 1999). The reduction in human-vector contact is one of the important strategies of National Malaria Control Program (NMCP) apart from early diagnosis and prompt treatment. Impregnated bed-nets in small scale trials were successful (Khin-Maung-Lwin and Soe-Aung, 1996; Tun-Lin *et al*, 1996; 1998). Malaria causes a loss of productivity at individual and household levels thus hampering community development. The Department of Health of Myanmar has launched the "Human Development Initiative" (HDI) Project assisted by United Nations Development Program (UNDP) in 11 townships since 1994 including Laputta from Aye-yar-waddy Division, a region of mangrove delta. HDI encompasses one project aimed at reduction of malaria morbidity and mortality through upgrading health services and increasing community participation in preventive measures. Concomitantly, self-care manuals are to be distributed to rural households in March 2000, following self-care training sessions for village women. This is among one of the strategies to improve rural community access to primary health care. Women's participation in decision-making and their control over

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resources is key to sustaining the health benefits realized (Manderson *et al*, 1996). As Mac Cormack (1992) pointed out, greater participation of women in health and development programs is a process of social empowerment. Women's role in community development is also enhanced by recruiting them as trainers in self-care training program. Women's contribution in care-giving and preventive measures for malaria at home in Myanmar has already been recognized (Tin-Oo *et al*, 1998; 2000). An understanding of people's beliefs and behaviors focusing on malaria related to gender perspectives is crucial to enhance the successful implementation of self-care intervention. Details of gender roles linked to division of labor, exposure to mosquitos and malaria prevention activities need to be examined for sustainability of community development programs in the localities (Rathgeber and Vlassoff, 1993; Vlassoff, 1994; Tin-Oo *et al*, 2000). This paper addresses the night-time activities of villagers which increase their vector contact, local ways of preventing mosquito bites and destruction of mosquito breeding places and how perceptions of men and women might influence the prevention of malaria and the success of community development programs.

MATERIALS AND METHODS

Study site

Laputta township is situated in Aye-yar-waddy Division, close to the Bay of Bengal at longitude 53.9º to 94.3ºE and lattitude 15.4ºN to 16.2ºN. Laputta is one of the 27 townships of Aye-yar-waddy Division and is approximately 274 km southwest of Yangon City. The township is less developed than others in the Aye-yar-waddy Division due to long lasting insurgency (1950-1972), remoteness especially in rainy season with transport only by waterways and damage of forest reserve areas due to charcoal production resulting in scarcity of food. With the aim of poverty alleviation and community development, HDI-Phase I was introduced between 1994-1996. Women and children of low-income households are the target beneficiaries. Micro-credit programs, income generation schemes and educational opportunities are provided as a basis for community empowerment. Approximately 10% of total population of 259,232 in the township in 1997 reside in high risk area for malaria with perennial transmission (as classified by Department of Health). Maximum temperature is 102ºF in dry season (February to April) and a minimum of 70ºF in cool season (November to January). There are creeks and streams in rural areas and variations in salinity of water with favorable humidity and shade influences breeding of anopheline mosquitos like *An. sundaicus, An. vagus, An. subpictus* and *An. tassellatus*. Findings from the study in two villages indicate the primary vector as *An. sundaicus*, common during October to February (cool dry season). The vector feeds on both human and animals, an indoor as well as an outdoor biter with peak biting time between 18.00 to 24.00 hours (TDR, 1998). Since 1996, insecticide spraying with DDT in the whole township has been suspended except for development projects and emergency situations. Thus, promotion of vector control operations by community participation becomes an important strategy for reduction of malaria transmission in the study area.

Methodology

Qualitative data were collected between January to February, 2000 by focus group discussions (FGDs) in eight study villages. Four villages each from high-risk area and from moderate risk area for malaria transmission in the township were randomly selected. When sampling the villages, remote status (that is more than one hour travel to where the midwife resides) and nature of livelihood of villagers (fishing or farming/gardening) were considered as break characteristics. Demographic situation of each village is shown in Table 1.

From each village, six to eight men and women were purposefully selected to participate in focus group discussions (one separate group each for men and women) except in two villages (C and F) where two FGDs for both

Table 1
Demographics of eight study villages in Laputta Township (1999).

Status	Village	Malaria endemicity	Major source of income	Number of households	Total population	Male population	Female population
	A	Moderate risk	Farming	100	940	466	474
	B	Moderate risk	Fishing	100	621	309	312
Remote	C	High risk	Fishing	544	2,718	1,356	1,362
	D	High risk	Farming	154	887	442	445
	E	Moderate risk	Farming	100	582	284	298
Non-remote	F	High risk	Fishing	100	480	239	241
	G	Moderate risk	Farming	170	815	402	413
	H	High risk	Fishing	256	3,896	1,878	2,018

Source: Township Health Department, Laputta, 2000.

sexes were conducted summing up to 20. Altogether 80 men and 86 women participated. Men and women were separately assigned in FGDs to investigate different nature of their work, roles and responsibilities and perspectives for vector control measures and malaria. Each FGD lasted for one and a half to two hours and all were audio-taped. Qualitative data obtained were transcribed and translated into English. Code mapping and segmentation of data were done by using ETHNOGRAPH version 4.1.

For data triangulation, non-participant observation was done by two trained observers in village D (a farming/gardening village) and village F (a fishing village). Two nights were spent in each village observing activities of adults and children between 18.00 to 23.00 hours.

RESULTS

Activities enhancing man-vector contact

Night-time activities among the villagers were assessed to explore the likelihood of human-vector contact. Data from focus groups and observations revealed that men usually went to liquor houses and tea shops in groups in the evenings around 19.00 until 22.00-23.00 hours for leisure. During that time, women visited from house to house or watched videos at the common parlor in their villages, mostly accompanied by their children. Common patterns of non-leisure activities, were preparing paddy at the end of rainy season, catching crabs, fish and prawns along the creeks and streams at night mostly by men. Women were responsible for sorting prawns and fish after fishing boats came in late at night and in the early hours of the morning. This is necessary to get ready for the market in the morning. Those in farming villages were involved in weaving leaves of 'dani' (a kind of a plant growing in mangrove forest) to make roofs and walls for their huts or preparing paddy by husking the rice during the time of harvest (usually from November to January).

It seems that both men and women are exposed to the mosquito vector during the peak biting time at night according to their nature of work and responsibilities denoting the equal chance of contracting the infection.

Knowledge of mosquitos

During FGDs, both men and women reported that *'chin'* (local term for mosquitos) are plentiful at the beginning of rainy season (May, June) and also around March and April. They perceived that mosquitos breed in ponds, dirty water, domestic water pots and containers, in pools, dani woods, salt plant, bushes, grasses, tree holes, underneath the leaves, and inside shallow wells. However, one male

participant had no idea where mosquitos came from.

Majority were aware of three kinds of mosquitos in their surroundings namely pale/ white ones, dark/black ones and striped ones. Women's groups from three villages (F,G and H) and men's groups from four villages (A, B, C and F) even described the size of the mosquitos as follows: " Pale ones are smaller than the dark ones"; "Striped ones with sharp stings and remain itchy after a bite. White and slender ones, black and big ones also. At first no pain, but later itchy".

Some observers differentiated between biting positions: "Pale ones bite in vertical position". " Black ones bite in horizontal position in contrast to pale ones". "Striped ones bite in horizontal position". However, some failed to note the biting positions: " I haven't looked at the way of biting as I was at work".

As for the biting time, both men and women perceived that mosquitos commonly bite before midnight, more at dusk. They could even point out that striped ones '*Chin pone'* (hidden mosquitos) bite commonly in the afternoon.

Perceptions towards mosquitos and malaria

One group of women from a fishing village (H) felt that they will be free from disease when there is no mosquito. They have accepted the fact that following mosquito bite, *'nget-pyar'* (local term for malaria) and *'thway-lun-toke kway'* (local term for dengue hemorrhagic fever) may occur and that a bite of a single mosquito carrying the germs could result in *nget-pyar.* One women's group from the farming village (G) thought that the relationship between the disease and mosquito bite was controversial. One men's group from the fishing village (B) stated as below:

M: Do you think that mosquito bite can cause nget-pyar?

3: I've heard about this in town. We need to clean the environment to reduce mosquito bite. Once you are bitten by mosquito, you might get 'nget-pyar'. Talking about that matter also at the tea-shop.

9: Mosquito bite can cause 'nget-pyar'.

1,2: We don't know.

3: We don't know how mosquito bite relates to 'nget-pyar'. Once you are bitten by mosquito, you might have rashes and itchiness.

Some knew about relationship between mosquitos and nget-pyar but some were ignorant and perceived mosquitos only as a nuisance. This idea is also supported by one women's group from farming village (D): "Once bitten by mosquitos, it's unhealthy because of disturbance in sleep". It seems that women tend to link sleeplessness due to mosquito bite at night with ill health.

Ways to protect from mosquito bite

Focus group participants reported the use of mosquito coils, bed-nets, incense sticks, smokes, burning fire, clothes with long sleeves, long sarong, liquid repellants, and fans to protect themselves from mosquito bites indoors. When fishing at night along the streams, villagers covered themselves with blankets or used bed-nets to avoid mosquitos. Sometimes dried coconut shells were burnt inside a pot to drive mosquitos away. One male participant from village (B) mentioned that "Madama woods in small pieces are burnt inside the broken bowl painted with ceramic". Some thought that housewives are the persons responsible for carrying out tasks to prevent nget-pyar like burning mosquito coils at night.

Bed-nets were mentioned by a majority to protect from mosquito bites at home. Villagers perceived that at least two-thirds or a three-quarters of households owned bed-nets but most of them shared. Some used family size nets and often four people sleeping inside one net. The commonest reason for not having a single bed-net in the household being lack of money to buy one. Owners of bed-nets sometimes failed to sleep inside them due to heat, coming back late at night or because mosquitos were absent.

After probing on getting malaria both men and women said that the probability will be

less if sleep with bed-nets. However, one men's group from village C commented as below:

M: Do you think that nget-pyar can be prevented by using bed-nets?

All: We don't think so. While sleeping with bed-nets, mosquitos can reach inside.

3: Nget-pyar can occur due to other causes, not only by mosquitos.

2: I agreed. It might be due to weather. Sometimes in the afternoon, we go to the sea and then get fever. Not related to mosquitos. It happens by itself.

Perceptions towards reducing mosquito population

Some of the male and female focus group discussants believed that nget-pyar can be prevented by reducing the number of mosquitos in their villages. However, one women's group from village C stated as follows:

M: Could you reduce the number of mosquitos?

All: Not possible due to presence of forests.

5: Mosquitos come from the forest even when we have cleaned our surroundings.

This idea is also supported by women discussants from village H: "We don't think so. Lots of forests in our surroundings favors breeding of mosquitos". One woman from village G expressed her negative way of thinking; "I don't think so. It's not that easy. Once you kill one, three, four mosquitos will come again".

Another woman from village A mentioned that: "Mosquitos are abundant here. Once there is water, there'll be mosquitos. Impossible to dry up the water collections". The other reason for difficulty in reducing mosquito population cited by women's group in village E was that: "We have lots of trees here with plenty of fallen leaves which become rotten from where mosquitos breed. It won't be possible to clean such kind of leaves."

Villagers knew that mosquito breeding sites can be destroyed by filling pools, covering wells, spraying, improving drains, cleaning the surroundings. One man participant from village F cited that: "Young form of mosquitos are found in the pools. It's better to build the drains to dry up the pools. Anyway, mosquitos are still here". Villagers participating in FGDs recognize the effect of spraying: "We've noticed reduction in mosquito bites inside the houses one, two days after spraying". One men's group from village H expressed their feelings towards prevention of *'nget-pyar'* indicating self-reliance.

M: Whom do you think is most responsible in preventing nget-pyar?

1: Ourselves.

3: Our wives.

5: The whole family is responsible. They should keep the environment clean to prevent nget-pyar. Should cover pots inside the house otherwise mosquitos will breed inside.

The need for collective efforts by community members to destroy breeding sites were acknowledged by one men's group from village C. "Breeding sites can be reduced by means of efforts of villagers and health personnel. This awareness might be developed further by means of self-care intervention at household level.

DISCUSSION

Promotion of health is integral to community development. Currently, women-centered health and development projects in Myanmar aim to explore the different interests and specific needs of rural women and to promote women's advancement. Malaria is recognized as one of the illnesses that adversely affect women's work and household chores (A/Rahman *et al*, 1996). Findings from the present study indicate that work activities may increase human and vector contact in both men and women. Thus, women when facing risk factors to infection need access to knowledge as regards vectors, malaria illness and resources. The complexity of links between gender, work, health and illness are based on the sexual division of labor and the sexual division of responsibility. These issues together with local ecological, environmental, economic and cultural factors influence exposure to risk

of infection and the risk of disease (Rathgeber, 1990).

Links between bed-net use and occurrence of malaria is weak suggesting little correlation between the perceived role of mosquitos and malaria and the use of nets as found in some African countries (Aikins *et al*, 1994). Affordability is a major determinant in the non-use of untreated bed-nets. Insufficient number of bed-nets and ignorance may lead to non-use of bed-nets at night thus increasing contact with mosquitos. This calls for a clarity of message in causation of malaria and the importance of bed-net use to prevent malaria which has already been incorporated into self-care manuals. Community micro-credit program for the rural poor and income generation activities for women in the study area should also focus on convincing rural households to give priority to purchase of bed-nets. Specifically, contact with primary vector *An. sundaicus* with its indoor biting habit late at night can be reduced by sleeping with bed-nets (Meek, 1995). Very similar situations were observed in Kelantan, Malaysia and Pondicherry, India where vector control interventions also addressed other community needs such as housing, income generation, the provision of incentives or motivation to collaborate (Haliza-Mohd Riji, 1989; Rajagopalan and Panicker, 1985). Most of the study participants were aware of breeding sites of mosquitos in their surroundings but very few had undertaken activities to destroy breeding sites. Rather, some of the men and women hold negative views on reduction of mosquito population. As a primary vector, *An. sundaicus* is amenable to larval control measures by means of chemicals or biological one and their breeding grounds are easily accessible (Meek, 1995). As noted by focus group discussants, women are responsible for environmental cleanliness in their households. If health related technologies reach women (MacCormack, 1989; Winch *et al*, 1992) by means of self-care intervention in study villages, the problem of malaria may be partly controlled at household and village levels. Thus, it will be beneficial to motivate the community for larval control through local women groups in study villages like Maternal and Child Welfare Association. Further research agenda on vector control measures and existing gender power relations in rural households should pay meticulous attention especially following self-care intervention. To strengthen the interests of local women in dealing with problem of malaria and community development. More importantly, appropriate and feasible methods need to be promoted.

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REFERENCES

A/Rahman HS, Mohamedani AA, Mirgani EM, *et al*. Gender aspects and women's participation in the control and management of malaria in Central Sudan. *Soc Sci Med* 1996; 42: 1433-46.

Aikins MK, Pickering H, Greenwood BM. Attitudes to malaria, traditional practices and bed-nets (mosquito nets) as vector control measures: A comparative study in five West African countries. *J Trop Med Hyg* 1994; 97: 81-6.

Department of Health. Annual Report of Vector-borne Diseases Control Program, Yangon, Myanmar, 1999.

Haliza Mohd Riji. Community health workers and the community in malaria control:the Malaysian example. In: Uren M, Blok J, Manderson L, eds. Arboviral Research in Australia. Proceedings of the 5th Symposium, Brisbane, CSIRO-QIMR, 1989.

Khin-Maung-Lwin, Soe-Aung. Participatory action research on the utilization of permethrin impregnated bed-nets among community members in Ywangan Township, southern Shan State, Myanmar. Paper presented at the Myanmar

Health Research Congress, 1996.

MacCormack C. Technology and women's health in developing countries. *Int J Health Serv* 1989; 19: 681-92.

MacCormack C. Planning and evaluating women's participation in primary health care. *Soc Sci Med* 1992; 35: 831-7.

Manderson L, Mark T, Woelz N. Women's Participation in Health and Development Projects. WHO/ TDR/ GTD/RP/96.1 Gender and Tropical Diseases Resource Papers Series No. 1, World Health Organization, 1996.

Meek SR. Vector control in some countries of Southeast Asia: Comparing the vectors and the strategies. *Ann Trop Med Parasitol* 1995; 89: 135-47.

Ministry of Health. National Health Plan (1996-2001) Yangon, Myanmar, 1996.

Rajagopalan K, Panicker KN. Feasibility of community participation for vector control in villages. *Indian J Med Res* 1985; 80: 117-24.

Rathgeber, Vlassoff C. Gender and tropical diseases: A new research focus. *Soc Sci Med* 1993; 37: 513-20.

Rathgeber EM. WID, WAD, GAD: Trends in research and practice. *J Develop Areas* 1990; 24: 489-502.

TDR. TDR gets a new task force on gender. TDR News 1998: 56.

Tin-Oo, Pe-Thet-Htoon, Khin-Thet-Wai, Saw-Lwin. Women's role in home management of malaria in rural Taikkyi. 1998 (Manuscript in preparation).

Tin-Oo, Pe-Thet-Htoon, Parks W. Khin-Thet-Wai. Exploring strategies for gender-sensitive interventions in self-care against malaria among rural people in Laputta, Myanmar. *Health Policy Planning* 2000 (Submitted for publication).

Tun-Lin, W. Sein-Min, Sein-Thaung, Tin-Oo. Entomological information from two villages in Laputta, Myanmar, 2000 (An unpublished report).

Tun-Lin, W Nay-Soe-Maung, Htain-Lin, *et al*. A comparison on the effectiveness of two entomological intervention measures using randomized longitudinal trials in a malaria endemic forested, hilly area of Myanmar. Paper presented at the Myanmar Health Research Congress, 1996.

Tun-Lin, W, Nay-Soe-Maung, Soe-Aung, *et al*. Evaluation of the impact of two entomological intervention measures in a malaria endemic forested hilly area of Myanmar. Paper presented at the Myanmar Health Research Congress, 1998.

Vlassoff C. Gender inequalities in health in the third world: Uncharted ground. *Soc Sci Med* 1994; 39: 1249-59.

Winch P, Kendall C, Gubler D. Effectiveness of community participation in vector-borne disease control. *Health Policy Plan* 1992; 7: 342-51.