Notions of Risk and Vulnerability to Malaria

Nina T. Castillo-Carandang

Department of Clinical Epidemiology, College of Medicine, University of the Philippines Manila

ABSTRACT

An estimated average of 150 to 200 Filipinos developed malaria daily in the late 1990s (Malaria Control Service, 1996). For the 10-year period from 1985 to 1995 an average of PhP 100 million had been spent annually at the national government level alone for programs against malaria.

The primary investigator (NCC) spent ten months living in Barangay Mangingisda (an endemic rural village) in Puerto Princesa City, Palawan from June 1995 to April 1996. With the help of assistants and households who acted as epidemiologic sentinels in four high and four low prevalence puroks (hamlets), she interviewed residents to elicit their perceptions and beliefs, practices and decision-making patterns in relation to the perceived causation/etiology, mode of transmission, susceptibility, signs and symptoms, case finding, treatment and prevention of malaria.

A Triangulated Approach for Health Social Science Research on Malaria, using both qualitative and quantitative methods (modified version of the Qualitative Contrasting Groups Design – QCGD formulated by Higginbotham and Proteous) was employed. A combined medical anthropological and epidemiological approach to the study of fever and malaria, which included a review of the development of the malaria control program in the Philippines as a historical process, was used.

The concept of habituation can be used to describe the situation of the residents in Barangay Mangingisda. Perceived risk and vulnerability to fever and malaria, and its treatment and prevention were influenced by interactive variables. Responses to fever and perceived malaria at the household and community levels must be viewed within the context of lay capacities and perceived vulnerabilities (pasma or humoral imbalance which renders one susceptible to illness, presence of semilya ng malaria or "seeds" of malaria"), folk perceptions of resistance (resistensiya) and the state of being malariado (present or past experience with malaria), coping, and prevention. People employed diverse means to ensure the continued viability of their households amidst the immediate threat of malaria during its acute phase as well as its long-term threat due to the chronicity of the disease.

Key Words: malaria, risk, vulnerability, health social science.

Introduction

The ancient scourge of malaria has returned with a vengeance resulting in global morbidity (247 million clinical cases yearly of which 21 million occurs in Asia) and mortality (881,000 deaths per year of which 36,000 deaths occur in Asia) levels which make the disease a major social and economic burden worldwide. Nearly nine out of 10 deaths (85%) occur in children under five years of age. Malaria poses a further threat to approximately 3 billion persons or 50 percent of the world's population who reside in 109 malaria-endemic countries.[c]

In 2008, 57 of 79 provinces in the Philippines were endemic for malaria (DOH 2008), and 12.5 million Filipinos (specially the indigenous cultural groups) were at risk for the disease.[d] Endemic areas are primarily rural, with a mountainous or hilly topography, and isolated or with socio-political conflict. Malaria is the 8th leading cause of morbidity with an estimated prevalence of 27.6 cases per 100,000 population in 2006[e] and 0.17 deaths per 100,000 population. In 2006, Presidential Proclamation no. 1168 declared the month of November of every year as malaria awareness month. This further underscored the fact that malaria is a life-threatening disease with serious socio-economic consequences for many Filipino citizens as well as for the Philippine government.

At the time of the study (1996), the Malaria Control Service estimated that an average of 150 to 200 Filipinos develop malaria daily and that majority of those afflicted with malaria belong to the working group age of 15-45 years of age. An average of PhP 100 million was spent annually at the national government level alone for insecticides, drugs, and manpower for the 10-year period from 1985 to 1995.

Malaria as disease and malaria as illness

The World Health Organization[f] argues that malaria is not only a health problem *per se*. This is because the key determinants of malaria and solutions to the malaria problem are not directly within the control of the health sector alone. Other factors involved in the classified determinants of malaria into: (1) *Very Important factors* (climate change, lack of adequate housing, lack of multisector coordination, lack of surveillance system, unavailability of health services, failure to use prevention strategies, and lack of effective vaccine); (2) *Important Factors* (deforestation, irrigation projects and dams, illiteracy, low status of women, increased travel and migration); and (3) *Minor, indirect or no factor* (poor sanitation and hygiene, hunger and malnutrition, lack of prevention tools or strategies, lack of effective treatment).

Malaria is both a *disease*, marked by symptoms such as fever and chills and confirmed by laboratory examinations such as blood smears for malarial parasites; and an *illness*,

Corresponding author: Nina T. Castillo-Carandang, MA, MSc
Department of Clinical Epidemiology, College of Medicine
University of the Philippines Manila
547 Pedro Gil St., Ermita Manila 1000, Philippines
Telephone: +632 5254098/ +632 522-8380
Email: nina.castillo@gmail.com

which people experience, respond to, and give meaning to within the context of their socio-cultural, economic, and physical environments. (Figure 1)

As a disease, the general clinical picture (signs and symptoms) of malaria, its natural history and pathophysiology, etiology, prognosis, and treatment are generally presumed to be more or less similar in different settings. The disease or so-called medical model of malaria contends that malaria has relatively the same general manifestations, etiology, diagnosis, treatment, and prevention wherever one goes. Both clinical and epidemiological research has contributed to a better understanding of malaria as a disease. This knowledge is updated in the face of recent developments in biomedical technology and/or new discoveries related to its diagnosis, treatment, and control.

Malaria as an illness also has a widely recognized natural history, causation, and treatment. It is the socio-cultural-psychological and economic dimensions of malaria (rather than its biological nature *per se*), and the context in which it occurs which influences the meaning of malaria for residents of endemic areas, and especially for the malaria patient and his social network (household members, relatives, neighbors, and community). The aforementioned dimensions and context guide people in understanding malaria and its etiology as well as how signs and symptoms should be construed and treatments selected. The meanings attached to, and the responses to malaria as an illness are negotiated through the various social institutions which shape reactions to the illness (Negotiated Meanings and Responses to Malaria). These meanings and responses are rooted in shared beliefs and experiences which are characteristic of particular localities (Social Construction of Malaria).

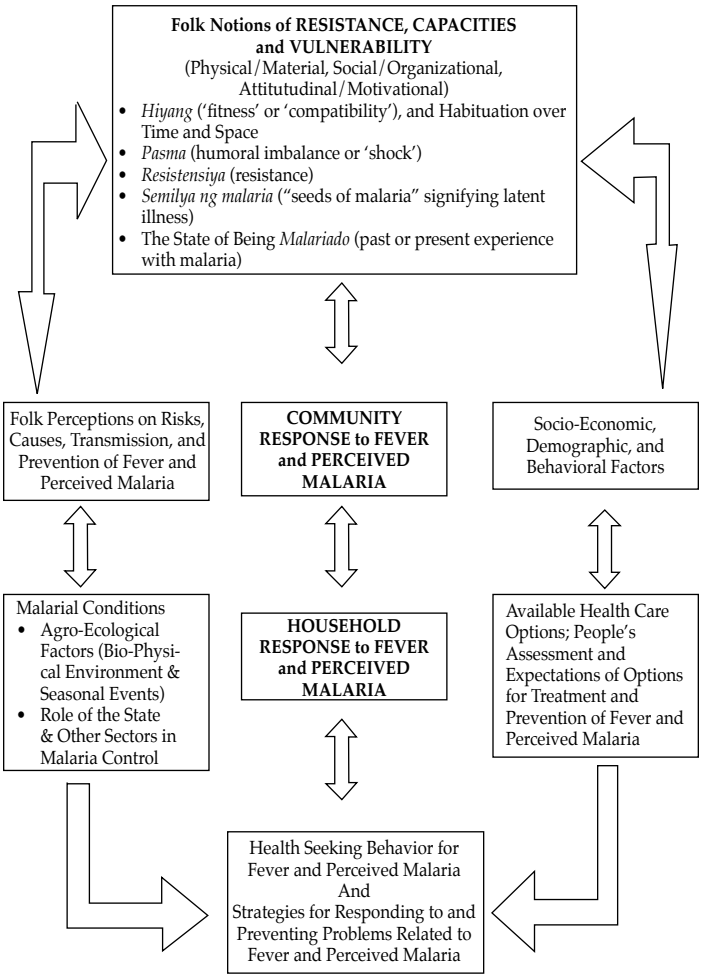

Figure 1. CONCEPTUAL FRAMEWORK

General description of the study

This study was undertaken to look closely at malaria through a combined anthropological-epidemiological perspective. A socio-cultural context of fever and perceived malaria in an endemic Philippine rural *barangay* (village) was investigated, focusing on the household and community response to fever and perceived malaria. (Note: The terms *malaria* and *perceived malaria* were used interchangeably).

The study also looked at the manner in which the households and the community coped with fever and malaria within their midst, and the roles of men, women, and children in individual as well as collective responses to fever and malaria. This included insights into the households' and community's diagnosis, treatment, and coping strategies for fever and malaria. The implications for malaria control programs of community strategies and people's perceptions and practices in relation to malaria were also considered.

Malaria is characterized by its acute nature on one hand, and by its chronic nature, on the other.[8] Hence, the study also looked into the households' responses to the immediate threats (during the acute phase of the disease) and the long-term threats (chronicity of the disease) posed by malaria to the household's *viability* or coping capacity. Such a coping capacity or viability was defined in terms of the household's ability to respond to the adversities caused by diseases such as malaria.

In this study, it was assumed that households and communities were rendered vulnerable to malaria by the interaction of such factors as individual susceptibility, socio-economic and political conditions, and malarial conditions or environmental risks. If households (and also communities) found themselves vulnerable due to the perceived presence and/or threat posed by malaria in their midst, then their viability as social and reproductive units was also at risk.

Materials and Methods

This study was conducted in Barangay Mangingisda, Puerto Princesa, Palawan. This site was chosen because the nature of the study required that it be conducted in an area which was highly endemic for malaria and further characterized by perennial transmission patterns for the disease. A key consideration was the strong potential

for collaboration with health professionals, and active participation from residents in the locality. Other factors for the choice were: (a) the barangay's morbidity and mortality patterns due to malaria; (b) the peace and order situation; (c) the language (i.e., Tagalog and/or Cebuano) in the study area—both languages were known and spoken by the researchers; and (d) the project's resource constraints.

The location was chosen in close consultation with the Malaria Control Program (MCP) of the Department of Health at the national, regional, and provincial levels. Other malaria researchers (biomedical and social) were also consulted. Much input was also given by many academic professors, especially Prof. Dr. Pieter H. Streefland who helped in the development of the study protocol and other academicians from the Medical Anthropology Unit of University of Amsterdam in the Netherlands as well as clinical epidemiology colleagues (Mary Ann D. Lansang, MD and Mark Nichter, PhD)

The potentials for collaboration and active participation were principal considerations in choosing the study area. Malaria research had already been conducted (and/or is currently being undertaken) in Barangay Mangingisda and in the adjacent Barangay Luzviminda. However, all these studies were biomedical in nature. Both the malaria researchers and the local malaria control personnel who have worked in the area were supportive of the present study on the socio-cultural aspects of malaria as no such study had been done in the area before. As one malaria researcher had remarked to the principal investigator, "This is the missing link in our efforts at malaria control."

Another key influence in the decision to live and work in Barangay Mangingisda was the fact that there was an active Barangay Health Council whose members were anxious to further understand and improve the malaria situation in their community.

After consultations and interviews with key informants and visits to the area, eight *puroks* or *sitios* (hamlets) were chosen in the *barangay* (village); they were then classified as those belonging to either high or low prevalence areas. The four high prevalence puroks (sparsely populated and located in rolling to hilly terrain) and the four low prevalence puroks (more densely populated and located in the plains area and along the coast) were contiguous to each other in terms of physical location. The classification of these eight puroks/sitios was based on the following: (1) available epidemiological information on malaria morbidity and mortality in the barangay (etic perspective); and (2) local residents' perceptions of which puroks had more or less malaria (emic perspective). It is notable that the grouping of puroks on the basis of emic categorizations was perfectly congruent with the grouping of puroks on the basis of etic classifications.

A Community-Based Sentinel Surveillance (CBSS) system was established in the study area. This was a core method of the study, and was illustrative of the combined anthropological-epidemiological approach to field research on fever and perceived malaria. The CBSS was based on the premises of the modified Qualitative Contrasting Groups Design (QCDG which was formulated by Higginbotham and Proteous) and has been adapted for the study.

The Community-Based Sentinel Surveillance (CBSS) system enabled the research team to increase its coverage of the barangay as well as its sample size especially as far as the outcomes of interest (i.e., fever and malaria) were concerned. Limitations of time, manpower, and energy as well as the size and topography of the barangay, and the distances between houses precluded wider and more intensive coverage. The CBSS also allowed the team to look for cases of positive deviance (i.e., households which had no reported illness episodes) in the community. Selected households primarily functioned as SENTINELS for malaria and fever. These sentinel households were also asked to be on the lookout for other episodes of illness in their neighboring households regardless of whether or not the illness was perceived to be related to malaria and fever. These illness episodes were regularly reported to the research team every 2 weeks (Bi-Monthly Morbidity Recall or 2 Week Morbidity Recall - 2WMR) when the sentinels were visited by the team. Households with reported illness episodes were then visited by the research team (case following).

Morbidity reports from the sentinels to the team were not limited solely to these bi-monthly visits. Many of the sentinels spontaneously gave updates to the researchers whenever their paths crossed in the barangay. Other barangay residents (non-sentinels) had come to know of the research team and the study which the team was conducting. So some non-sentinels also informed the team about illness episodes they came across and/or have experienced themselves. There were 30 sentinel households in the four LOW and prevalence puroks and 30 sentinel households in the four HIGH prevalence puroks. These households were purposely chosen after a rapid assessment (ocular survey/reconnaissance, review of documents, community mapping) had been conducted. Various key informants, most especially barangay health workers and purok leaders, were also consulted.

The other key informants who were consulted regarding perceived prevalence of malaria per sitio, and selection of sentinel households included the following: the physician-in-charge of the provincial community-based health program, the city health officer, provincial malaria coordinator, rural malaria coordinator under whose jurisdiction the barangay was included. A parasitologist from the University of the Philippines' College of Public Health and a Japanese entomologist who had both been conducting research in the barangay were also interviewed.

One barangay health worker (BHW) was chosen per purok, and the households of these BHWs plus the purok leaders and store owners were also invited to become sentinels. These sentinels were well-known in the purok and had quite extensive social networks. Hence, the probability

of them being aware of cases of illness among the other residents (oftentimes kinfolk) in the purok was high. Other factors which are taken into consideration in the selection of sentinel households include the following: (a) the physical location and accessibility of the houses, (b) proximity of the household to their neighbors, (c)proximity to a breeding site, (d) length of residence in the community (new settler of one to five years residence OR old settler of six to ten years or more residence), (e) presence of children under five years old in household, (f) sources of income/occupation, and (g) the presence of pregnant woman in household, (h) morbidity profile of household based upon epidemiological information from Barangay Health Station and information from key informants. Key informants were asked which households were perceived to have more frequent bouts of illness compared to others.

Data collection techniques

To maximize the benefits of a Triangulated Approach for Health Social Science Research on Malaria, various methods, described below, were employed. All data collection instruments were developed, pre-tested, and refined before actual use in the study. Verbal informed consent was solicited from all study participants prior to the conduct of interviews and focus groups discussions.

1. **Rapid Assessment Procedures (RAP)** were initially done to familiarize the research team with the barangay, to acquaint the team and the residents with each other, and to establish baseline epidemiological, socio-economic-demographic, and ecological data at the provincial, city, *barangay* (village), and *purok/sitio* (hamlet) levels. RAP was also used to assess the perceived prevalence of malaria by *purok* (hamlet) as defined by the local residents, and comparing them with available epidemiological data; and to identify specific households in the eight sitios (four HIGH prevalence puroks and four LOW prevalence puroks) as ***sentinel households***.

2. **Review of Documents** on local health and agro-ecological/environmental conditions; the epidemiology of malaria; the history of and policies related to malaria control in the Philippines. Records of the Laboratory Department of the City Health Office (CHO) were also reviewed to get epidemiological insights into malaria in Puerto Princesa City. The Laboratory Department kept logbooks for all the examinations they conducted. The logbooks usually contained the patient's name, age, barangay of residence, date and result of the laboratory examination. The earliest existing records which were available were for November 1991. Records for September 1992 could not be located. In addition to this, not all patient records had complete information such as purok of residence. The available logbooks from November 1991 to June 1996 were reviewed for the needed information which was then copied manually and subsequently tallied prior to preparation of data tables, and data analysis.

3. **Key Informant Interviews (KIs)** among patients, their households, community leaders, and health workers at the level of the barangay, city, and province. The key informant interviews, done by the primary investigator, provided an opportunity to use a **historical approach** by asking informants to describe (as well as compare and contrast) past and present socio-cultural, economic, and ecological conditions in the community in relation to malaria and other diseases.

4. **In-Depth/Long Interviews** (**IDIs**) were conducted among the sentinel households (n=60), pregnant women (n=15), and households which reported episodes of hospitalization during the past 12 months (n=15). Four data collection forms (QES) were developed and pre-tested for use among the sentinels. The questionnaire (QES) number and themes covered in the IDIs for the sentinels were: *QES #1* Socio-Economic and Demographic Profile, Pregnancy and Mortality in the Household, and Morbidity History within the Past Month; *QES #2A* Occupational Questions for Fishermen, Farmers, Shell Gatherers; *QES #2B* Explanatory Models for Fever and Malaria; *QES #3* House Questions, Daily Routine, Household Chores, Livelihood and Division of Labor, Decision-Making in the Household and Social Support, Sleeping Patterns and Bednet Use, and Mosquito Questions; and *QES #4* House Spraying.

The questionnaire for the *Pregnant Women* asked about the women's obstetric history, problems with pregnancy, and self-care practices. They were also asked if there were pregnancy-related taboos for food, herbs, and drugs especially bitter-tasting medicines such as chloroquine. The women were asked if they perceived themselves to be vulnerable to fever and malaria during pregnancy.

The *Hospitalization Questionnaire* focused on reasons for hospital confinement, decision-making regarding hospitalization, costs incurred and sources of financing, results of treatment, and perceptions regarding hospital services received.

5. **Focus Group Discussions (FGDs)**, facilitated by the primary investigator, were done to elicit illness terms, signs and symptoms related to malaria; perceptions of fever and malaria among patients, their households, and community. The FGDs were also used at the end of the fieldwork to obtain feedback as well as validate some of the study's preliminary findings.

6. **Bi-Monthly Morbidity Recalls** were conducted among 30 sentinel households in the four HIGH prevalence puroks and 30 sentinel households in the four LOW prevalence puroks. A data collection form (2 Week Morbidity Recall - 2WMR) was designed and pre-tested for the bi-monthly morbidity recall.

7. **Case Following (CF)** was done after an illness was reported by a sentinel household. This strategy (CF) allowed malaria and fever to be observed within the context of other diseases in the community, and it further provided information as to which households seemed more susceptible to illness.

8. **Construction of Narratives on Health and Illness.**

An essay writing contest was sponsored by the project and a modest cash prize of 150 pesos (US$ 4) was given to each of the winners in the elementary school and high school categories. Participants came from the local village elementary (usually 12 year olds) and high schools (usually 16 year olds).

9. Drug Survey of *Sari-Sari* (Variety) Stores in Barangay Mangingisda and Sitio Rubber in Barangay Luzviminda, Puerto Princesa City. 17 of the 18 stores in the study area sold medicines. A questionnaire was developed and pre-tested for the drug survey. The topics covered in the *Drug Survey Questionnaire* were: reasons for selling or not selling medicines, frequency of drug sales, kinds of drugs sold specially for malaria and fever (pediatric and adult), indications for use of drugs, and who often purchases the drugs from the stores.

After the *Drug Survey Questionnaire* was administered, the research team then asked the storekeepers for their cooperation in monitoring drug sales in their store for a period of four months (September-December 1995). There were 431 drug purchases recorded during the said period when store owners monitored drug sales.

The store owners were asked to fill up a *Drug Sales Form* whenever somebody bought a drug of whatever kind from their store. The name and amount of the drug purchased, date of purchase, name of buyer, for whom the drug was bought, and reasons for purchase of drug, were also listed down.

All storekeepers were provided blank copies of the *Drug Sales Form*, a pencil and sharpener, and a plastic envelope to keep the forms in. No compensation was provided for the assistance provided by the storekeepers. Storekeepers were visited every two weeks by the research team.

10. A small informal survey of anti-malarials sold in drugstores/pharmacies in Puerto Princesa City was also undertaken. The present study included a few large and small drug stores (n=5) which were located near the public market (n=2) and the Palawan Provincial Hospital (n=3) in the Poblacion (city proper/center) of Puerto Princesa City.

11. Clinic Interviews of patients consulting in the Out-Patient Department (OPD, n=29), and of patients having a Blood Smear for Malaria Parasite test at the Laboratory Division (n=71) of the City Health Office (CHO) of Puerto Princesa were also conducted. Separate data collection forms had been developed and pre-tested for both groups of patients. Observations and short interviews were conducted on seven different days (usually mornings) for a three-month period (October- December 1995).

The patients in the Out-Patient Department (OPD) were interviewed before and after they were seen by the clinic staff. The *Clinic Interview Questionnaire* asked about the patient's chief complaint, duration of illness and self-treatment prior to consultation, and decision-making about consultation. After the patient was seen by the health worker, he/she was then asked about the diagnosis as well as the treatment or advice given to them by the clinic staff. The patient was also asked if he/she was supposed to come back for a check-up.

The research team: Its work protocol, management and analysis of data

The research team was composed primarily of the principal investigator (a social scientist with training in sociology, medical anthropology, health social science, and clinical epidemiology) and two research assistants. The three investigators lived and worked together in the study area in a house for almost a year, sharing household chores and sleeping on the floor. The two research assistants composed of a nurse-midwife who had worked as a research assistant in a research project which documented resistance to chloroquine among malaria patients residing in the barangay which adjoined the study area, and a dentist who was interested in community-based work. Both research assistants had previous and on-going field experience in community organizing and conducting medical-evangelical missions in remote barangays of Palawan and other areas in the Philippines. Both research assistants underwent two weeks of training on methods for social science research on malaria which the primary investigator developed in consultation with social science and biomedical colleagues and the project biostatistician. Two field research aides, trained by the investigators, helped when the two research assistants were out of the country for medical-evangelical missions.

Data collections were done from June to December 1995 and from February to April 1996. Field work covered both the dry and wet seasons. The research team kept field diaries and took notes whenever interviews and focus group discussions (FGDs) were conducted. The eight puroks covered by the study were spread over rolling terrain; reaching the puroks and the houses of sentinels and cases required long walks, oftentimes through areas with steep inclines and tall, thick grasses. Houses in the high prevalence puroks which were located in so-called Farm Lots were also located far from each other. On the other hand, houses in the low prevalence areas which were located in so-called Home Lots were nearer each other and were also relatively more accessible.

All four HIGH prevalence puroks were visited for four man days (usually one purok per day) during the same week while all four LOW prevalence puroks were visited the succeeding week. One man day was usually set for report writing and for call back visits in case no one was at home at the time of the visit or the team was unable to visit the homes due to inclement weather. A specially-designed appointment card written in Filipino was given to the sentinel households reminding them of the team's next scheduled visit.

Encoding of data was done in the Department of Clinical Epidemiology of the University of the Philippines' College of Medicine in Manila. The project biostatistician supervised the team of data encoders. The Manila-based team members

included one project clerk/typist and three short-term data encoders. Data was encoded using *dBase 3* and analysis was done using *Epi-Info 6.0*. Narratives were encoded using *WordPerfect 5.1* and *MS Word 6.0*. Themes were identified from the narrative reports and were subjected to content analysis.

Results

Malaria is characterized by its acute nature on one hand, and by its chronic nature, on the other. The household's responses to the immediate threats (during the acute phase of the disease) and the long-term threats (chronicity of the disease) posed by malaria to the household's viability or coping capacity were indeed vital to its well-being and survival, as shown by the responses not only during the key informant interviews and focus group discussions, but also in the field study in both the high and low prevalence households in the chosen puroks. Such a coping capacity or viability was defined in terms of the household's ability to respond to the adversities caused by diseases such as malaria.

In the Filipino context, perceived risk and vulnerability could also be viewed in relation to the concept of habituation, and to the concept of *hiyang*. Hardon (1991, 1994)[h] (1991, 1994) and Tan (1994, 1996)[i] described *hiyang* in terms of compatibility or suitability or being fit/good for a person and/or his significant others (such as his/her family members). The concept of *hiyang* connotes some seemingly innate or natural affinity for something (food, medicine, cosmetics) or someone (social relations). This is in contrast to the concept of habituation which suggests congruity or compatibility which is not necessarily inherent but which develops over time and space, and with various life events and experiences.

Habituation is a process whereby one becomes accustomed or conditioned to something or certain situations by "frequent repetition or prolonged exposure".[j] The concept of habituation can be used to describe the situation of residents of Barangay Mangingisda (the study site) all of whom were migrants to the village. The new settlers in the hyperendemic village generally started out as being both at epidemiologic (scientific) and "lived risk"[k] for malaria. They may not have been fully aware of the epidemiologic risk in the area, and thus, engaged in what Yates (1992) called "non-deliberative risk-taking behavior". On the other hand, there might have been some who knew about the risk of contracting malaria but still decided to settle in Barangay Mangingisda ("deliberative risk-taking behavior"), and just tried to lessen the perceived potential dangers ("risk handling"[l]).

The migrants were also vulnerable or in a "weakened or open condition which made them susceptible to illness"[m] when they first arrived in Barangay Mangingisda. Their "physical/material vulnerability" was manifest in their lack of adequate financial resources, food (*pasma sa gutom*), and medicines (among others) when they arrived in the area. Not all groups of migrants were well-organized; hence, some of these groups also suffered from "social/organizational vulnerability", and to some extent, also "attitudinal/motivational vulnerability".[n] These were evident from the fact that many migrants were unprepared not only for the epidemiologic risk of malaria in the area but also for the hardships associated with life in the frontier as a pioneer.

Many of the migrants recalled being ill with malaria (and some informants remembered numerous malaria-related deaths) when they first arrived in the village. However, because of the passage of time, the migrants' continuing adaptation to their new environment ("*Nasanay na kami sa pagtira dito*" – "We have gotten used to living here"); their actual experience of being sick with malaria (i.e., being *malariado* and their familiarity with preventive and curative measures) as well as their application of malaria control measures by the government, the incidence of malaria was perceived to have decreased. The people, in effect, had undergone a process of inurement or acclimatization or seasoning to their new bio-physical and socio-cultural environments. They might not have been initially *hiyang* to their new environment but had achieved some level of "fitness" or "compatibility" through the process of habituation.

People's choice of therapy (specially drugs) for fever and malaria (as well as for other illnesses such as acute respiratory infections), and their assessment of the efficacy and safety of such were affected by considerations such as: (1) individual (gender, age, body size, etc.) and family characteristics; (2) the nature of the illness (perceived etiology, signs and symptoms 3) the nature of the drug or therapy (brand, dosage, dosage form, price); and (4) the perceived effect of the therapy. These were in consonance with the studies of Hardon (1991, 1994). Hence, what was *hiyang* for one person may not be *hiyang* for another, or what may be *hiyang* for an adult may not be *hiyang* for a child, and so on. Tan (1996:136) contended that, "*Hiyang* seems to relate more to a 'fit' between the person and the medicine, one which could encompass safety without assuring a total absence of risk."

In the field study on fever and perceived malaria, development as related to health was seen as the process which facilitates people's increased capacity to provide for their needs. Rural folk attempted to control their socio-economic-political and physical environment to decrease present and future vulnerabilities to events (such as malaria) which endanger their well-being.

Residents of hyperendemic areas such as those in Barangay Mangingisda lived with the constant challenge of having malaria in their midst. This constituted a clear and present danger as far as the epidemiological risk (i.e., potential morbidity and mortality, disease transmission, etc.) associated with malaria as a disease was concerned. The notion of "lived risk"[o] implied that the meanings, experiences, and responses related to malaria as an illness were personal, qualitative, and marked by uncertainty as

well as the probability of loss (economic, social, physical).

Individuals, their households, and community were inextricably linked to one another, and to the larger socio-economic and political environment in which they lived and were a part of. Thus, if viewed from a "multi-level or linkages perspective"[p], what existed at the "micro" (or local) level(s) such as that of the individual, his household, and community would have a different meaning if interpreted at or viewed from a "macro" (or global) level.

Discussion

People employed diverse ways and means to ensure the continued viability of their households amidst the immediate threat of malaria during its acute phase as well as its long-term threat due to the chronicity of the disease. Community and household responses were manifest in various health seeking behaviors; and strategies for seeing through, and averting and/or lessening problems ("risk handling") related to the occurrence of fever and perceived malaria.

The perceived risk and vulnerability to fever and malaria, and its treatment and prevention were influenced by interactive variables such as: (1) the prevailing socio-economic, demographic, and behavioral situation; (2) malarial conditions (agro-ecology, role of the state and other sectors in malaria control); (3) folk perceptions on malaria; and (4) available options in the "professional, folk, and/or popular sectors of the local health care system"[q], and people's assessments and expectations of such options.

Responses to fever and perceived malaria at the household and community levels in Barangay Mangingisda must be viewed within the context of lay capacities and perceived vulnerabilities (physical/material, social/organizational), and folk perceptions of resistance (*resistensiya*), coping, and prevention. Such notions were manifest in: (1) people's ideas about *resistensiya* (resistance), coping with, and preventing fever and malaria; (2) their experiences of *pasma* (humoral imbalance or 'shock' brought about by hunger, changes in the weather, hard work, etc.) which made one weak, and therefore, susceptible to illness; and (3) the state of being *malariado*.

Being *malariado* meant that a person had present or past experience with malaria. And if one was *malariado*, there was the possibility of pre-empting more serious malaria attacks in the future. But there was also the possibility of harboring *semilya ng malaria* (literally translated as "seeds" or "semen of malaria") interpreted as latent illness which could be "transformed" to an active state of disease. The "transition" from a latent state (i.e., having *semilya ng malaria*) to an active state was possible if one was not completely cured and/or there were certain predisposing conditions such as *pasma* which lowered *resistensiya* or impeded the effectiveness of coping and/or preventive strategies such as the intake of anti-malarials or the use of bed nets, etc. Concomitantly, if a person wanted to be malaria-free (and therefore, not *malariado*) she/he must eat meals on time and generally, take good care of one's self so as not to weaken *resistensiya*.

The concepts of illness and disease are different from the point of view of biomedicine (etic perspective) vis-a-vis the point of view of the people themselves (emic perspective). *Illness* from the emic perspective constitutes the person's own experience, understanding, and response to what he/she perceives to be happening to his/her own body. A person's definition of illness is influenced by (among other things) his social network as well as by socio-cultural and economic factors. On the other hand, *disease* from the etic perspective would represent the medical practitioner's biomedical definition of what is happening to a person's bodily processes. The medical practitioner's definition of disease is based upon physical examination of the patient along with the conduct of various laboratory and other biomedical diagnostic procedures. It is therefore often assumed (rightly or wrongly) that illness would be more arbitrary understandings of bodily processes and is characterized by definitions which are highly subjective in nature as compared to disease which is assumed to be a more objective definition.

Malaria is both a disease (a biological entity from the biomedical or etic/outsider's perspective) and an illness (a socio-cultural and behavioral phenomenon from the lay or emic/insider's perspective). The differences between both views have often led to divergent attitudes, approaches, and behaviors thus, limited success in malaria control. It must be acknowledged that there is still a tendency among many biomedical/health professionals and para-professionals to attribute the failure of most disease control programs to the people's so-called lack of cooperation and ignorance of biomedical explanations of disease causation, treatment, and prevention. On the other hand, there has also been a growing awareness of the importance of social, behavioral, and cultural factors in the transmission, epidemiology, diagnosis, treatment and management, prevention, and control of malaria. Further to this, Helman[r] argues that economic underdevelopment, and drug resistance on both the part of the parasite and of the patient do not alone account for the continuing spread of malaria. Helman further posits that, "In certain communities, a variety of cultural beliefs and practices are also part of the problem"; and concludes from his review of anthropological studies of malaria that such folk beliefs can affect the possibility that people and communities will: (1) collaborate with malaria control programs; (2) be cognizant of the early symptoms of malaria; and (3) will accept or reject medical treatment for the disease. People's understanding and explanation of causation/etiology of malaria are also affected by such beliefs. The anthropological studies reviewed by Helman (2001) in his view grapple with two primary concerns: (1) if people associate mosquito bites to how malaria comes about; and (2) how people interpret the importance of fever, and if they relate it or not to malaria.

Conclusions

This anthropologic-epidemiologic study brought out many salient points on the perception of fever and perceived malaria in Barangay Mangingisda, Puerto Princesa, an endemic area for malaria. Using the Triangulated Approach for Health Social Science Research on Malaria of studying fever and perceived malaria, which included both emic (insider) and etic (outsider) viewpoints, many aspects of malaria, both as a disease and an illness, were uncovered. This non-interventional study involved not only medical but also non-medical personnel and households in the area, with the primary investigator and her research assistants obtaining information in different but complementary methods. Thus were the concepts of being *malariado, pasma sa gutom* and *resistensiya* further elaborated and taken into their proper contexts in the study.

As the preceding discussion on the rationale, challenges, and opportunities of using a combined anthro-epid approach highlights, malaria is not only important epidemiologically (at a macro level) but more so on a very personal level for those people who have to live with malaria in their midst (at a micro level). The epidemiology of malaria is related to people's experiences, perceptions and behaviors (and vice-versa).

It is now recognized that technical answers alone are inadequate to contain most if not all diseases, and malaria is no exception. Identifying what still needs to be done and how best these can be accomplished given the various socio-cultural, behavioral, economic, and epidemiological constraints in different micro ecological and socio-economic environments remain a challenge for all those involved in the fight against malaria.

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