Cultural Epidemiology For Malaria Control In Ghana

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To God be the glory for the great things he has done!

Dedicated to my family:
Cynthia, Stephanie, Reginald.
Also to Mabel and My mother (Agnes Ami Dzowoedzi Anappy),
For your love, devotion and prayers.

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ACC	Affected Child's Caretaker
CN	Convulsion Negative
CP	Convulsion Positive
DHMT	District Health Management Team
EMIC	Insiders' perspective
ETIC	Outsiders' perspective
FGD	Focus Group Discussions
GHS	Ghana Health Service
IEC	Information Education and Communication
IMCI	Integrated Management of Childhood Illnesses
IPT	Intermittent Preventive Treatment
ITN	Insecticide Treated Net
MOH	Ministry of Health
MOH	Ministry of Health
MRI	Malaria-related illness
MRI-CN	Malaria-related illness without convulsion
MRI-CP	Malaria-related illness with convulsions
NGPVCN	Non-affected General population Vignette depicting Childhood malaria related illness with convulsion negative
NGPVCP	Non-affected General population Vignette depicting Childhood malaria related illness with convulsion positive
NGPVPW	Non-affected general Population Vignette depicting a Pregnant Woman
NMIMR	Noguchi Memorial Institute for Medical Research
NPWVPW	Non-affected Pregnant Women Vignette depicting a Pregnant Woman
PFMI	Perceived Febrile Malaria-related Illness
PHC	Primary Health Care
RBM	Roll Back Malaria
SP	Sulfadoxine Pyrimethamine
STI	Swiss Tropical Institute
UNICEF	United Nations Children's Fund
WHO	World Health Organization

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Ethical Review

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Zusammenfassung

Malaria ist eine Bedrohung für mehr als 40% der Weltbevölkerung und ist verantwortlich für mehr als 300 Millionen Akutfälle jedes Jahr, was zu 1.2. Millionen Todesfälle im Jahr 2002 geführt hat. Über 80% der Morbidität und Mortalität in Bezug auf Malaria ist in subsaharischen Länder Afrikas anzufinden, wobei Kinder unter 5 Jahren und schwangere Frauen dem grössten Risiko ausgesetzt sind.

Die Situation in Ghana in Bezug auf Malaria ist typisch für das subsaharische Afrika, wo Malaria die Hauptkrankheit unter den zehn häufigsten gesehenen Krankheiten in Kliniken ist. Wegen der grossen Armut in diesem Gebiet besteht die Behandlung in den meisten Haushalten zuerst aus einer Kombination aus Kräutern und rezeptfreien Medikamenten. Solche rezeptfreien Antimalaria Medikamente, hauptsächlich Chloroquine und Analgetika, werden meistens in unzulänglichen Dosierungen verkauft. Gerade in Ghana, sowie in anderen afrikanischen Gebieten südlich der Sahara, wo hauptsächlich das potentiell tödliche Malaria *Plasmodium falciparum* auftritt, kann eine frühzeitige und effektive Behandlung Leben retten, in dem der Verlauf der Krankheit zu schwerwiegender Malaria verhindert wird. Deshalb ist die frühzeitige Erkennung und die effektive und rechtzeitige Behandlung von Malaria ein wichtiges Element von globalen Kontrollstrategien.

Das Hauptziel der Studie war es das Auftreten, die Verteilung und die bestimmenden Faktoren der MRI Erfahrungen, deren Bedeutungen und das darauf basierende Verhalten festzustellen, besonders da diese das Risiko und das schützende Gesundheitsverhalten beeinflussen, welche relevant sind für Malariainterventionen. Die Studie wurde in zwei ländlichen Gebieten in Ghana durchgeführt (Obosomasi, das sich in der Waldvegetationzone befindet, und Galo-Sota in der Küstensavannezone) über einen Zeitraum von Oktober 2002 bis April 2004.

Zwei zu unterscheidende, jedoch miteinander zusammengehörende Datensammlungsphasen wurden in dieser kulturell epidemiologischen Studie eingesetzt. Die erste ethnographische Phase brachte lokal relevante Kategorien in Bezug auf die Krankheitserfahrungen, deren Bedeutungen und das darauf basierende Verhalten durch verschiedenste teilnehmende Methoden hervor (Freies auflisten und Einstufung, teilnehmendes Kartieren,

Fokusgruppendiskussionen und Tiefeninterviews). Auf diese Phase aufbauend, benutzte die zweite Phase die dadurch erzeugten Kategorien und Repräsentationen um ein EMIC Interview, das sich auf die Perspektive der Betroffenen zentriert, zu erstellen. Dieses Interview ist ein Instrument, womit die Häufigkeit, die Determinanten und die Distributionen dieser lokal relevanten Kategorien gemessen werden kann. Das daraus gewonnene Wissen ist notwendig um adäquate Interventionsstrategien für alle Gruppen innerhalb einer Bevölkerung erstellen zu können.

Die wichtigsten Resultate sind:
Malaria wird als Hauptgesundheitsproblem in diesen Gemeinden anerkannt, dass Kinder und schwangere Frauen mehr als andere Segmente der Bevölkerung nachteilig betrifft.
Moskitos werden als die Hauptursache der in Verbindung mit Malaria stehenden Krankheiten ohne Fieberkrämpfe angesehen. Dieses Ergebnis steht konträr zu früherer Studien im südlichen Ghana, was auf sich verändernde lokale Vorstellungen zeigt.
Menschen in den Gemeinden berichteten, dass Hitze erzeugt durch die Sonne eine Hauptursache der in Verbindung mit Malaria stehenden Krankheiten ohne Fieberkrämpfe ist. Dieses Resultat weißt auf die Notwendigkeit weitere Studien hin, welche die Verbindung zwischen Hitze erzeugt durch die Sonne und Auslösern der klinischen Malariaepisoden untersuchen.

Die Eigenbehandlung der in Verbindung mit Malaria stehenden Krankheiten Zuhause ist sehr verbreitet und besteht aus einer Mischung von Kräuter- und biomedizinischen Medikationen.
Die Klinik und das Krankenhaus sind außerhalb des Haushaltes bevorzugte Orte für die Behandlung von MRI, einschließlich der Fieberkrämpfe. Die meisten Patienten gehen jedoch ziemlich spät dorthin.

Fieberkrämpfe wurden als Bestandteil des in Verbindung mit Malaria stehenden Krankheitskomplexes angesehen, und Moskitobisse und fiebrige Malariaepisoden wurden als zwei wichtige Ursachen von MRI mit Krämpfen erkannt. Auch diese Resultate unterscheiden sich von den meisten vorhergehenden Berichten aus dem subsaharischen Afrika.
Obwohl die Menschen Moskitos, Malaria und Fieberkrämpfe miteinander in Beziehung setzten, glauben Einheimische weiterhin, dass übernatürliche Kräfte unter anderem die Ursachen von Fieberkrämpfen sind, bzw. erklären, dass Geister den Malaria Anfall ausnutzen um Unheil zu verbreiten.

Einheimische Heiler spielen immer noch eine wichtige Rolle im Management von Fieberkrämpfen, besonders in Bezug auf einen ganzheitlichen Heilungsprozess. Durch Rituale werden boshafte Geister, welche die Fieberkrämpfe verursachen, vertrieben, was den Weg für eine biomedizinische Behandlung ebnet und eine komplette Heilung sichert. Traditionelle Heiler sind auch bekannt als diejenigen, welche die Gabe haben Kinder vor Krampfanfälle zu schützen.

Trotz der ähnlichen Erzählungen in Bezug auf Malaria von schwangeren Frauen und der allgemeinen Bevölkerung, gab es einige bedeutende Unterschiede, welche die Notwendigkeit für geschlechter-spezifische Interventionsprogramme während der Schwangerschaft aufzeigen. Die kürzliche Einführung von periodischen Präventionsgrogrammen scheint dies zu erreichen, müsste jedoch auf Programme in den Gemeinden ausgebreitet werden, um die Last der in Verbindung mit Malaria stehenden Krankheiten zu reduzieren.
Auf Vignette basierende Interviews bringen die Kategorien der in Verbindung mit Malaria stehenden Krankheitserfahrungen, deren Bedeutungen und das darauf basierende Verhalten hervor, aber mit dem Unterschied, dass sie die Frequenzen dieser aufzeigen.

In dieser Studie wurde zum ersten mal Kulturelle Epidemiologie angewendet, um die soziokulturellen Aspekte von Malaria zu untersuchen. Die Ergebnisse zeigen, dass soziokulturelle Faktoren wesentlich zu dem zunehmenden Wissen über die Kontrolle von Malaria beitragen.

In der vorliegenden Doktorarbeit werden in einzelnen Artikeln die Implikationen dieser Arbeit auf Interventionsstrategien in der Malariabekämpfung diskutiert.

Summary

Malaria is a threat to more than 40% of the world's population and responsible for more than 300 million acute cases each year, which resulted in 1.2 million deaths in 2002. Over 80% of the malaria-related morbidity and mortality occur in sub-Saharan Africa with children under five and pregnant women at highest risk.

The malaria situation in Ghana is typical of sub-Saharan Africa, where malaria is ranked first among the ten diseases most frequently seen in most health facilities in the country. Due to widespread poverty, however, many households depend on a combination of herbs and over-the-counter drugs, usually consisting of inadequate doses of antimalarials, chiefly chloroquine and analgesics. In Ghana, as in other parts of sub-Saharan Africa, where malaria is due mainly to *Plasmodium falciparum* and potentially fatal, early and effective treatment saves lives by preventing disease progression to severe malaria. In view of this, prompt recognition and effective timely treatment of malaria is a critical element of global malaria control strategies.

The overall goal of this study was to determine the occurrence, distribution, and determinants of MRI experiences, meanings and behaviours, inasmuch as these affect risk, and protective behaviours relevant for intervention to reduce malaria-related morbidity and mortality in children and pregnant women. The study was carried out in two rural communities (Obosomasi, located in the forest vegetation zone, and Galo-Sota, in the coastal savannah zone) in Ghana, over the period from October 2002 to April 2004.
This was a cultural epidemiological study employing two-stage data collection strategies. The first stage was ethnographic study, which made use of free listing and rating, participatory mapping, focus group discussions and in-depth interviews to generate relevant local malaria-related illness experiences, meanings and behaviours. The second stage made use of these relevant categories and representations to design EMIC (insiders' perspective) interviews, which are tools to assess the occurrence, determinants and distributions of these categories to guide appropriate interventions for all segments of the population studied.

Results indicate that:

Malaria is recognised as a leading health problem in these communities, affecting children and pregnant women more than other segments of the population.

Mosquitoes were identifies as the leading causes of malaria-related illness without convulsions, a finding at odds with earlier studies in southern Ghana, indicating changing local perceptions.

Local people reported that heat from the sun is a major cause of malaria-related illness without convulsions, and this finding suggests a need for further study to determine the link between heat from the sun and triggers of clinical malaria episodes.
Home treatment for malaria-related illness is very common and entails the use of herbal and biomedical medications.

The clinic and hospital were preferred sites for treatment of MRI, including convulsions, outside the home, but most patients get there rather late.
Convulsions were identified as a component of the malaria-related illness complex, and mosquito bites and febrile malaria episodes were identified as two important causes of MRI with convulsions. This finding was also a departure from most previous reports from sub-Saharan Africa.

Despite relating mosquito, malaria and convulsions to one another, local people continue to implicate supernatural forces among causes of convulsions, but explaining that spirits take advantage of malaria attacks to make their mischief.

Local healers continue to play an important role in the management of convulsions, but mainly as one aspect of the holistic healing process, involving both rituals to drive away mischievous spirits and biomedical treatments. That is, local healers perform rituals to drive away the spirit causing the convulsions, which paves the way for biomedical treatment and a complete cure. Local healers are also reputed to have ‘medicine’ to protect children from convulsive attacks.

Despite the general agreement between the accounts of pregnant women and the general population, there were some significant differences suggesting the need for gender-specific interventions to control malaria-related illness in pregnancy. The recent introduction of intermittent preventive treatment appears responsive to this need, but it may need to be extended as a community programme to achieve the goal of reducing the malaria-related disease burden in pregnancy.

Vignette-based interviews evoke responses specifying categories of malaria-related illness experiences, meanings, and behaviours similar to case-based interviews, but with differences in frequencies of reporting these categories.

This is the first time that the cultural epidemiology framework has been applied to study the sociocultural aspects of malaria covered in this thesis, and it substantially adds to the growing body of knowledge of the importance of sociocultural factors in malaria control. The implications of the findings for interventions are discussed in individual papers presented in the thesis, and in consisting of a discussion of the overall study and conclusions.

Chapter 1: Introduction

1.1 Current Global Malaria Situation

Malaria remains a major cause of morbidity and mortality world-wide and statistics show that 3.2 billion people worldwide are at risk of being infected with the malaria parasite (WHO 2005; Korenromp *et al*. 2003). The malaria situation in Africa is getting worse as the disease continues to spread to previously non-endemic or low-transmission areas of eastern and southern parts of the continent (WHO, 1999a). The World Bank ranks malaria among the leading causes of lost disability-adjusted life years (DALYs). In 1998, sub-Saharan Africa was estimated to account for 34 million out of the world-wide figure of more than 39 million future life-years lost from disability and premature death (WHO, 1999a). It is no gain saying that the world map of malaria positively correspond to a world map of poverty. All rich countries are now normally outside the bounds of malaria risk (Trigg and Kondrachine, 1998; Magnussen *et al*. 2001).

Between 450 and 500 million clinical cases of malaria occur annually and Africa south of the Sahara accounts for around 60% of these cases, and over 80% of the deaths from Malaria. Most of the over I million Africans who die from Malaria are children under 5 years of age (WHO 2005; Breman, 2001). In rural Africa south of the Sahara, child mortality caused by malaria is estimated to have increased by up to twofold during the 1980s and the early 1990s, while mortality due to other causes decreased over the same period (WHO 2005). In Africa, 25-30% of all deaths among children under 5 years of age are attributable to malaria (Greenwood et al., 1987; 1997; Snow *et al*., 1999). Malaria-related effects on pregnant women, their foetuses, and their newborns comprise an extremely large but often hidden burden, especially in Africa. It is estimated that over 400,000 women develop anaemia during pregnancy annually as a result of malaria in sub-Saharan Africa alone. Severe anaemia due to malaria occurs in 1.5 to 6.0 million African children annually with a case fatality rate of nearly 15% (Van Geertruyden *et al*. 2004; Shulman and Dorman 2003; Murphy et al. 2001; Steketee *et al*. 2001). Malaria is estimated to cause 75,000-200,000 infant deaths per year in Africa south of the Sahara indirectly through: malaria-related maternal anaemia in pregnancy, low birth weight and premature delivery. It is widely recognized that the malaria situation in

sub-Saharan Africa is not getting any better (WHO, 2005; WHO, 2003; WHO, 2004; Korenromp *et al*. 2003).

The malaria situation in Ghana is typical of sub-Saharan Africa. In an epidemiological study of malaria in two ecological zones of Ghana (coastal savannah and forest), it was demonstrated that malaria was transmitted throughout the year in both ecological zones but with a higher prevalence of 51.3% in the forest zone compared to 36.6% in the coastal savannah zone (Afari *et al*. 1995). Thus, malaria transmission in southern Ghana is an all year round affair.

Available data suggest that malaria causes an estimated 8% of all certified deaths, ranks as the most common cause of death in children under 5 years of age, and accounts for the majority of outpatient clinic visits throughout the country (Ahmed 1992, Binka *et al*. 1998; MOH 1999). Over two decades ago, malaria was reported as a major cause of healthy days lost by the labour force (Morrow 1984), and available evidence suggests that this situation has not improved ever since.

1.2 Control Strategies

The earliest and most sustained attempts at malaria eradication carried out in West Africa could not achieve the expected interruption of transmission. It was widely acknowledged that apart from technical problems including lack of political commitment, and lack of financial resources to sustain the control activities, the behaviour of residents was not adequately studied and incorporated into the design and implementation of those programmes (Bruce-Chwatt & Archibald 1958).

The current Global malaria control strategy was adopted in 1992 in Amsterdam and confirmed by the World Health Assembly in 1993, it has four main components as follow;
to provide early diagnosis and prompt treatment.
to plan and implement selective and sustainable preventive measures, including vector control.
early detection, containment or prevention of epidemics.
to strengthen local capacities in basic and applied research to permit the regular assessment of country's malaria situation in particular the ecological, social and economic determinants of disease.

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Renewed focus on malaria control led to the formation of a number of initiatives including the Multilateral Initiative on Malaria in Africa (MIM) (http://mim.niv.gov/), the Roll Back Malaria Initiative (RBM) (http://www.who.int/rbm), and Medicine for Malaria Venture (MMV) http://malariamedicines.org/).

However, a large proportion of under fives die every year at home without having been able to visit a health facility (Trigg and Kondrachine 1998; Garg *et al*. 2001; Nsimba 2003). And this has prompted the promotion of home management of malaria as one of the control strategies. The potential benefit from this possibility is suggested by the fact that malaria treatment initiated promptly at home by caretakers of children may minimise the incidence of severe episodes and reduce mortality (Koram *et al*. 1995; Pagnoni *et al*. 1997; Kidane & Morrow 2000; Dunyo *et al*. 2001; Sirima *et al*. 2003). However, a recent report from Uganda has shown that the decision to treat fevers or suspected malaria at home goes beyond the mere availability of drugs but includes mothers' classifications of the child's illness either for biomedical treatment or for local treatment (Nsungwa-Sabiiti 2004). Similar reports were also made from Ghana (Hills et al 2003).

In Ghana, the Ministry of health (MOH) launched a five year Malaria Control Action Plan (MAP) (1993-1997) in November 1992 with the objective to reduce malaria-related morbidity and mortality to such low levels that it will cease to be a public health problem. The focus of attention in the strategy of the MAP was on prompt diagnosis and adequate treatment in the context of Primary Health Care (PHC) (Ghana, Ministry of Health, 1992). This goal has since remained a dream, despite reviews to incorporate other control activities like intermittent preventive treatment in pregnancy (ITP), the promotion of ITN use, and home-based treatment among others.

Malaria control in Africa and for that matter Ghana, however, continues to be threatened by inadequate resources and by drug resistance, and not by coincidence, Africa, which carries the greatest burden of malaria mortality and morbidity, is also the most resource limited. In global terms, malaria, poverty, and development are intrinsically linked and sub-Saharan Africa epitomises this cycle (Winstanley 2001; Sachs 1999). At a time when conflicts, displaced populations, HIV and global economics threaten the fragile livelihood of most rural populations in Africa, there is growing evidence that the burden from malaria has been

increasing since the 1980s (Korenromp *et al*., 2003; Trape *et al*., 1996; WHO 2005, 2003). This growing trend is likely to continue for decades taking into account increasing human activities due to population pressure leading to ecological changes, conflicts, and the current spread of parasite resistance to available cheap and widely used drugs in Africa while vaccine development continues to remain elusive.

As Africa continues to be engulfed in all these problems, it cannot continue to wait for the arrival of new control tools like vaccine, despite the potential of their contribution over the long term. Successful control requires clear understanding of mosquito-human-parasite triad relationships. Taking into accounts the fact that human beings are the link between the mosquito and the parasite, much of the incidence and mortality could be reduced with the available control means (Hausmann *et al*., 1998). However, for any control means to work effectively requires not only the involvement of the local population but the incorporation of local illness experience, meaning and behaviour into such programmes. There is also the need to know the occurrence, determinants and distribution of local MRI categories and representations to make control programmes more representative to meet the needs and expectations of the larger population. After all, human behaviour either contributes to the risk of malaria or protects from attack. This study examined the occurrence, determinants, and distribution of local MRI experience, meaning and behaviour to identify areas of intervention to improve timely, appropriate help-seeking, and thereby reduce MRI-related morbidity and mortality in the study population.

1.3 Social And Behavioural Research In Malaria

The literature on social and behavioural research on malaria has increased significantly in recent years (McCombie 1996; McCombie 2002; Williams and Jones 2004). However, social science studies on malaria in Africa have concentrated mostly on knowledge, attitude and practice (KAP) or beliefs and perception studies which mostly explored the gaps in local knowledge about MRI categories that overlaps with, or at least resembles, the biomedical definition of malaria as a disease. Most of these studies mainly centred on eliciting important gaps in local people's knowledge and understanding of malaria in terms of causes, treatment-seeking behaviour and preventive measures (Brieger *et al*., 1985; Ongore *et al*., 1989; Ramakrishna *et al*., 1989; Agyepong, 1992; Helizter-Allen & Kendall 1992; *Aikins et al*., 1994; Mwenesi, *et al*., 1995; Gessler *et al*., 1995b; Winch *et al*., 1996; Ahorlu *et al*., 1997; Matthies;

1998 Munguti 1998; Molyneux *et al*., 1999; Tarimo *et al*., 2000; Hausmann 2002 Adongo *et al*. 2005, Hills *et al*. 2003, Nsungwa-Sabiiti *et al*. 2004), see also reviews by McCombie (1996) and Williams and Jones (2004).

Other cross-cutting social issues have been considered. Tanner and Vlassoff (1998) stressed the importance of gender affecting help-seeking behaviour for malaria, and called for a better understanding of gender differences in order to implement malaria intervention programmes more effectively. Other social science studies in malaria have focused on socio-economic aspects of insecticide treated nets (ITN) (Aikins *et al*. 1994; Binka *et al*. 1997; Winch *et al*. 1997; Minja *et al*. 2001).

Like elsewhere in Africa, behavioural studies in Ghana were limited to either KAP or beliefs and perception studies with little or no attempt to study the distributions of illness experiences, meanings and behaviours in local populations (Agyepong, 1992; Hudelson and Adongo, 1995; Ahorlu *et al*., 1997; Hills *et al*. 2003). Behavioural research in malaria is generally weak on MRI experiences and the meaning attached to such experiences that may influence illness-related behaviours in the local community. A recent study by Adongo *et al*. (2005) relates community knowledge about malaria and its effects on insecticide-treated net use in northern Ghana and pointed out that issues regarding the cause, recognition, treatment and prevention have far-reaching implications for bednet use. There is also little evidence on local control measures especially in sub-Saharan Africa to inform control programmes to make them locally acceptable. Such information is important as it encourages the use of suitable local technologies to deliver culturally appropriate, socially acceptable, economically accessible, and operationally feasible and effective sustainable control programmes.

Current malaria control efforts in Ghana are based on basic epidemiology, where disease diagnosis and treatment from the professional point of view is the key as stated in the Malaria Control Action Plan (MOH, 1993). Such approach has been useful in chanting the immense burden of malaria and building consensus on the priority of malaria control. However, attempts to provide health education have been largely limited to messages that seek to address what the outsider perceived to be a lack of knowledge on the part of the local people with very little or no attempt to make use of relevant local practices that may be useful for control.

This calls for innovative ways of data collection techniques to elucidate illness experiences, meanings and behaviours and their distribution in the local population. A cultural epidemiological framework integrates anthropological and epidemiological perspectives and interests for data collection and focuses on local concepts, experience, meanings, and behaviour to guide control strategies rather than to specify burden. This could help us to direct control attentions to where they are mostly needed as may be identified by the local population.

1.4 General Overview Of Cultural Epidemiology Framework

The framework of cultural epidemiology arose from efforts to achieve an effective interdisciplinary collaboration, finding appropriate and useful ways of integrating the framework and methods of anthropology and epidemiology. To make this integration possible was the development of a framework and research instruments from insider's perspectives known collectively as EMIC interviews (Weiss, 1997, 2001). EMIC interviews are instruments used for assessing representations of illness or specified health problems from the perspective of affected persons, their family members or community members.

Classical epidemiology concerns itself with the occurrence, distribution and determinants of disease in a population from the etic or professional point of view. This provides a way to identify priorities and to evaluate the impact of policies and programmes and these are essential in as much as findings from such research influence priorities and the allocation of resources. However, such information is not enough to ensure that policy conforms to local needs, and a different but complementary set of questions and ways to answer them are needed (Weiss, 2001). Cultural epidemiology with its focus on the occurrence and distribution of local representation of illness experiences, meanings and behaviour (emic perspective) is positioned to play a supplementary role to basic epidemiology and anthropology. Cultural epidemiology therefore integrates these two perspectives to study locally valid illness representations and their distributions in the population to enhance local understanding and priorities for control.

Useful guidance for local programme implementation requires consideration not only of the classical epidemiology of diseases and disorders, but also attention to the local experience of

illness, its meanings, and both risk-related and help-seeking behaviours in the community. To make the cultural epidemiology concept an operational one requires innovative integration of frameworks and a mix of qualitative and quantitative research methods. Cultural epidemiology, therefore, places a priority on both the nature and the distribution of illness experiences, meanings, and behaviours which makes it complementary to medical anthropology and classical epidemiology.

The use of EMIC interviews for cultural epidemiology research focuses on local concepts of illness, rather than professional concepts of disorder. Therefore, it requires a systematic and more complex approach to coding, analysis, and presentation of local categories of experience, meanings and help-seeking behaviour (Weiss, 2001). The EMIC tool, which was developed in 1992, was successfully used to study mental health, leprosy, diarrhoea diseases, filariasis, onchocerciasis and tuberculosis (Weiss *et al*., 1997; Auer *et al*., 2000; Akogun, *et al*., 2001; Pan-African Study Group on Onchocercal Skin Diseases, 1995).

Early efforts to link anthropology and public health aimed to identify an authoritative community view, rather than explicitly considering the distribution of illness representations or other ethnographic features of communities. However, it is the patients' perceptions that ultimately determine whether there is sickness, rather than a biomedical evaluation, which usually comes later, if at all (Weiss, 2001). For ethnography to be useful the anthropologist must be conversant with both local and professional concepts and categories, and similarly, to make use of epidemiological research, it is necessary to relate its findings to suffering and context in the community. This is where cultural epidemiology stands to contribute to the integration of the two disciplines for the benefit of public health programmes in disease management and control.

As emphasised by Weiss (2001), illness representations are specified by variables, descriptions, and narratives accounting for the experience of illness, its meaning and illness-related behaviours that affect risk or reflect help-seeking. To understand what they are and how they operate, requires carefully integrated qualitative and quantitative researches approach. Ethnographic study is therefore well-suited to identify valid representations with reference to the framework of locally valid categories of experience, meaning, and behaviour.

Semi-structured EMIC interviews may then account for the distribution of these illness representations, making use of narratives to clarify the categories and to explain their role and significance. This mean that to be able to develop the EMIC interview tools, there is the need for ethnographic data to appreciate the context and concepts of illness, without which, an EMIC interview cannot be EMIC. The study reported in this thesis covered all these aspects of cultural epidemiological data collection stages, where ethnographic data collection methods were used to generated relevant local illness representations and categories which then informed the development of EMIC interview tools for data collection.

The construction of the EMIC tools adapted the framework reported by Weiss (2001). In that framework, experience, meaning, and behaviour were operationally defined as patterns of distress, perceived causes, and help-seeking respectively. However, for this study we have divided help-seeking into self-help at home and help-seeking from outside the home and additional feature labelled *control and prevention* as a part of practical local behaviour in the community.

The study draws on cultural epidemiology framework of the EMIC interviews to study sociocultural determinants of timely, appropriate treatment for childhood MRI; analytically assess MRI experience, meanings and behaviour of what is done in real life situation compare to what is said (comparing doing and saying); MRI with or without convulsion were also compared analytically to access the similarities and differences between these two presentations for control purposes; and finally we compared the accounts of pregnant women and selected members of the general population to assess MRI in pregnancy for gender specific understanding and control.

Chapter 2: Study Aims And Objectives, And Methods

2.1 General Aims

The general aim of this study was to determine the occurrence, distributions, and determinants of MRI experiences, meanings and behaviours in-as-much as these affect risk, or protective behaviours relevant for control activities in study communities to reduce MRI related morbidity and mortality in children and pregnant women.

2.2 Specific Objectives

To assess local understandings of malaria-related illness representations of experience, meaning and behaviour for children and pregnant women in southern Ghana (reported in paper 1).

Sociocultural determinants of treatment delay for childhood malaria in southern Ghana (reported in paper 2).

Saying and doing: comparing vignette-based accounts with case-based experience of childhood malaria-related illness in southern Ghana (reported in paper 1).

Community concept of malaria-related illness with and without convulsion in southern Ghana (reported in paper 1).

Malaria-related illness experience, meaning and behaviour in pregnancy: comparing the accounts of pregnant women and the general population (reported in paper 1).

2.3 Study Area

The Study was conducted in Ghana from October 2002 to April 2004. Ghana is located on the Coast of West Africa, and is bordered by Cote d'Ivoire on the west, Burkina Faso on the north, Togo on the east and the Atlantic Ocean on the south. The country is divided into ten administrative regions, and 140 districts. The total population of the country is estimated to be about 20 million people inhabiting a total land surface area of about 238,537 sq. km. The country has three ecologically different vegetation zones, the drier tropical Savannah on the

north, the forest and coastal Savannah on the south. Ghana has a temperature ranging from 19 to 40°C, with ecological variations. The study reported in this thesis was conducted in two districts in the south, Akuapim North District located in the forest zone and Keta District in the coastal Savannah zone (Fig. 1).

The two districts were purposively selected to represent forest and coastal savannah ecological zones of Ghana located in two regions. The advantages of these districts were that they are accessible and not too faraway from each other, about 150 km apart. The Akuapim North District has an added advantage of being a proposed site for a future vaccine trial to be carried out by the Noguchi Memorial Institute for Medical Research, where the principal author works and social and behavioural data on malaria were virtually non-existed in the district. However, after selecting the two districts, series of meetings were held with the District Health management Teams, and they were asked to select a community each that met some pre-determined criteria. These criteria were that 1) the estimated population of the community should fall between 5,000 and 10,000 people with a rural feature, 2) Identified by the DHMT as highly endemic for malaria, 3) should be accessible, and 4) has no chieftaincy dispute going on.

Since the DHMTs were involved in the selection of the communities, and actively took part in the community sensitisation durbars with the chiefs and people, and with the supports of the assemblyman or woman (community elected representative on the District assembly, which is the highest political structure in districts in Ghana), the research team received the supports and co operations needed for the smooth conduct of the work from residence.

The research was conducted from October 2002 to April 2004 in two malaria-endemic villages in Ghana: Galo-Sota in the Keta District and Obosomase in the Akuapim North District. Keta District is located in the coastal savannah vegetation zone in the Volta region, where about a third of the total surface area is covered with lakes and ponds. The district has a population of 137,751 (Government of Ghana national population census 2000). The Anlo people (98.8%) are the vast majority of people living in this district. The Anlo people are part of the Ewe-speaking people of Ghana (Keta District Annual Report 2001). The Anlo people are patrilineal, and predominantly subsistence food crop farmers, but many also cultivate shallot, a tropical spice grown in commercial quantity. Some are also fishermen and petty

traders. Galo-Sota and its environs is a rural village with a population of about 6,000 to 7,000. There is a health post in the centre of the village, which is staffed by a midwife, two community health nurses and two auxiliary workers. Malaria is the most common health problem treated at the community health post in 2003. A tributary of the Volta River passes through the village and divides the village into two, Galo and Sota, which collectively constitute Galo-Sota.

The Akuapim North District in the eastern region of Ghana is situated in the forest zone. The district population is 113,915, according to the last census (National population census 2000). The Akuapim-Twi speaking people predominate, and are mainly food crop farmers and petty traders. Oil palm, a cash crop, is cultivated on a limited scale. The district is currently being prepared as a site for a malaria vaccine trial. A Centre for Scientific Research into Plant Medicine is located in the district (Akuapim North District Annual Report 2001). Obosomase (population 7,000 to 8,000) is the rural study village in the Akuapim North District. It has a community clinic staffed by a midwife, a community health nurse and one auxiliary staff. As in Galo-Sota, malaria is the most common health problem treated at the community clinic in 2003.

2.4 General Methods Used For Data Collection

The fieldwork was in two parts and the various methods used for data collection are reported in more detail in the methods sections of each paper. However, the first part of the study, which spans from October 2002 to March 2003 was an ethnographic study (paper 1). Various data collection techniques were used for this part of the study as listed below;

2.4.1 Free Listing And Rating

Participants in this technique were asked to freely list and rate any health problem that affects the community that they know of. After individual sessions, participants were brought together to discuss the prominence of the ratted conditions for consensus. This allowed us to determine the common illnesses and their importance to the local populations. Participants who could not read and write were assisted by the research team in writing his or her list and ratings.

2.4.2 Participatory Mapping

This approach was used to map out perceived risk areas for mosquitoes breeding in the communities.

2.4.3 Focus Group Discussions

The usefulness if this approach in behavioural research has been acknowledged (Hardon et al 2001; Murphy et al 1992) FGD is an open and flexible data collection tool that is cheap and can be conducted rapidly for situational analysis. Despite some limitations, like a few vocal participants dominating discussions, especially when moderated by unskilled persons, FGD remains a useful means of generating divergent views and understanding the dynamics of research questions. The group interaction brings out group dynamics that allow the researcher to observe and record community consensus building process on topics of interest, as well taking note of contextual issues. In our study, it was used to generate local malaria-related illness experiences, meanings, and behaviour for further studies.

2.4.4 In-Depth Interviews

Issues raised during the FGD discussions were further exploited in in-depth interviews with selected opinion leaders, caretakers of children under five years of age and pregnant women. This was to enable us to raise more detailed discussions at individual level for further understanding of the malaria-related illness experience, meanings, and behaviour in the study communities.

2.4.5 Insiders' Perspective (EMIC) Interviews

The second part of the fieldwork was from October 2003 to April 2004, and was constituted of various locally valid adapted EMIC interviews (Weiss 2001). These are instruments used for assessing representations of illness or specified health problems from the perspective of affected persons, their family or community members. The design of these semi-structured interviews utilized findings from the ethnographic phase of the study to make the instruments amenable to local understandings (paper 2-5). The EMIC interviews put emphasis on recording both qualitative narratives and coded categories as these two data base complement each other for clarity and understanding of illness-related experiences,

meanings and behaviours in local populations.

2.5 Data Analysis

All five papers presented in this thesis overlap, and yet retain their uniqueness and specific aims and focus, detailed analysis procedures are presented in the analysis section of each paper. However, in general terms, data analysis follows the scheme presented here. Data from the two communities were pooled for all the analyses. Qualitative narrative data were entered into a word processor (Microsoft Word) and imported in a format that allows automatic coding by interview item in MAXqda, a programme for textual analysis (http://www.maxqda.com). These data were analysed to complement, and clarify aspects of illness-related experiences, meanings and behaviours. Variables of interest in the quantitative data-base were imported into MAXqda as selection variables. This enabled us to perform a phenomenological analysis of relevant coded segments from selected respondents in order to complement and clarify the meaning of categories that were analysed with quantitative methods.

Quantitative data were entered in EpiInfo 6.04 and subsequently analysed with the windows updated version 3.3 (CDC, 2004). We examined the frequencies of spontaneous and probed coded cultural epidemiological variables for categories of distress (PD), perceived causes (PC), self-help at home (SH) outside help-seeking (HS) and control and prevention ideas. We then computed prominence values for PC and PD variables for analysis of association with timely appropriate help-seeking. To specify the relative prominence of each category of malaria-related illness experience, meaning and behaviour, spontaneous responses to open-ended questions were assigned a prominence of 2, a prominence of 1 if mentioned only after probing and 0 if not mentioned at all. The single most important PD and PC contributed an additional value of 3 to the prominence, yielding a total prominence for each category ranging from 0 to 5. Prominence was computed for HS and SH variables based solely on whether they were reported spontaneously or in response to probed.

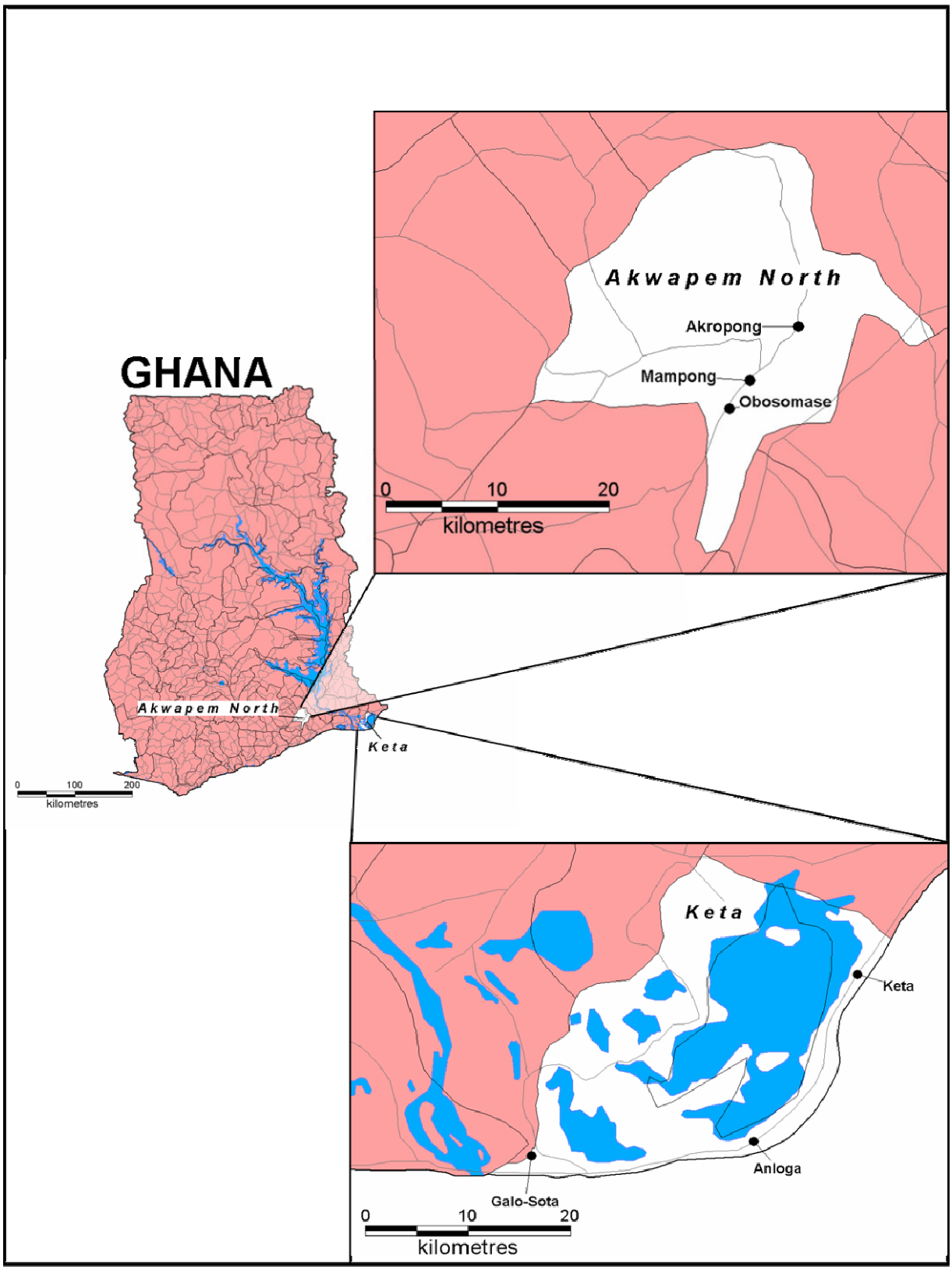

Figure 1 Map Of Ghana showing the two study Districts.

Chapter 3: Culture And Malaria Affecting Children And Pregnant Women In Two Rural Ghanaian Communities

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3.1 Abstract

The Malaria situation in Ghana is typical of many tropical African countries, where it remains a major cause of morbidity and mortality. Control methods generally emphasize prompt diagnosis and treatment. However, local experiences and meanings continue to influence help-seeking behaviour, which either promotes risk of infections or prevention. The aim of this study was to elicit relevant contemporary ethnographic features of malaria in children and pregnant women in two rural villages in Ghana for intervention, and to generate malaria-related illness categories and representations for cultural epidemiological study. Ethnographic data collection methods such as free listing and rating, participatory mapping, focus group discussions and in-depth interviews were used. Results show that malaria was listed as the most common illness in the study communities and outside help is sought after 2-3 days of illness onset. The clinic/hospital was the preferred choice of outside treatment, but cost and other constraints curtail their use. Social support in terms of finance was not easily available. Malaria cannot be eradicated but the frequency of attack could be reduced by avoiding perceived causes, like mosquito bites and heat from the sun. Convulsions were identified as a serious childhood illness and treated with both traditional and modern medicines. Mosquitoes were identified as a major nuisance and a cause of malaria and convulsions. Untreated bednets are widely used in one of our study villages, but not much in the other. This study highlights sociocultural features of malaria in two rural Ghanaian communities, and it indicates needs for regular re-evaluation of community experiences, meanings, and behaviour to inform the implementation and effectiveness of control programmes.

3.2 Introduction and Background

Malaria remains a major cause of morbidity and mortality worldwide, especially in sub-Saharan Africa where it accounts for more than 90% of the estimated 1.2 million deaths per year, worldwide. Malaria accounted for over one million deaths in Africa in 2002, and it is widely recognized that this situation is not improving quickly enough (Marsh *et. al.,* 1999; WHO, 2004). According to Breman, (2001), between 400 and 900 million acute febrile episodes of malaria occur yearly in children under 5 years of age living in endemic areas (Marsh, 1998; Bloland *et al*., 1993).

In Ghana, malaria is the most common cause of death in children under 5 years of age (MOH, 1999, Ahmed 1992). Malaria in our study communities is ranked first among the top

ten most frequent conditions seen at health facilities. In most cases, treatment for a febrile malaria episode is initiated at home where, due to widespread poverty, many households depend on a combination of herbs and over the counter drugs - usually consisting of inadequate doses of chloroquine and analgesics (Ahorlu *et al*, 1997; Agyepong 1992).

Effects of malaria on pregnant women, their foetuses, and their new-borns comprise an extremely large but often hidden burden. It is estimated that over 400,000 women develop anaemia during pregnancy annually as a result of malaria in sub-Saharan Africa alone. Severe anaemia due to malaria occurs in 1.5 to 6.0 million African children annually with a case fatality rate of nearly 15% (Murphy *et al*. 2001; Steketee *et al*. 2001). It has been documented that in areas where malaria was eliminated, economic growth increased substantially over the following five years compared to growth in neighbouring countries (Gallup *et al*., 2001).

Nevertheless, malaria control in Africa remains compromised by inadequate resources coupled with drug resistance. Africa, which carries the greatest burden of Malaria mortality and morbidity, is also the most resource-limited (Winstanley, 2001 Sachs J., 1999). Innovative strategies to meet the challenges of malaria control in Africa requires better appreciation of local malaria-related illness treatment and control measures that may be useful for control initiatives.

Home management of malaria is being promoted as a control strategy. This is justified by the fact that the earliest recognition of a febrile illness suspected to be malaria begins in the home where treatment is also initiated. However, the potential benefit from this possibility is suggested by the fact that malaria treatment initiated promptly at home, by caretakers of children, may minimise the incidence of severe episodes and reduce mortality (Pagnoni *et al*. 1997; Kidane & Morrow 2000; Dunyo *et al*. 2001, Sirima *et al*. 2003. For home management of malaria to be effective, we need to understand local ways of thinking about malaria, how they affect health-seeking behaviours, and how control strategies may acknowledge and respond to the impact of culture and community concepts.

However, if we are to understand the local health systems and make them achieve what we expect - life-saving and enhancing the life of the people who need them (WHO 2000), then we need to define health systems to include the traditional health care systems. This should

include the patterns of beliefs about the cause of illness, norms governing choice and evaluation of treatment, socially legitimated status roles, power, relationships, interactions settings and institutions (Kleiman 1980). Medical anthropology is concerned with how people in different cultures and social groups explain the cause of ill health, the types of treatment they believe in, and to whom they turn if they get ill. Medical anthropology also concerns itself with, how beliefs and practices relate to social changes in human organisation in both health and disease (Helman 1994). Hahn (1999) argued that intervention, including public health action, is fundamentally a process of social and cultural exchange. This exchange is a dynamic one, involving national and global context of local society and culture, which is constantly changing. Brown (1997) traces the history of malaria control efforts from early last century and suggests that cultural, rather than parasitological or entomological, factors are the primary cause of the current resurgence. Much of the scientific and political discussion about emerging and resurgent of infections has emphasized the disease pathogens, has de-emphasized the role of human behaviours in creating these new epidemiological trends, and has underemphasized human empowerment to improve health conditions (Brown 1997). To demonstrate the importance of culture and human behaviour in the equation of malaria transmission, prevention and control, this study examined sociocultural factors and representations (perceived causes, patterns of distress, help-seeking and preventive measures) in two rural communities in southern Ghana. The study was motivated by questions about practical implications for interventions, bearing in mind the changing nature of local experiences, meanings, and behaviours, inasmuch as this affect risk or preventive behaviour. Malaria-related illness categories and representations generated would be used to design cultural epidemiological study to demonstrate their determinants, occurrence, and distribution in the local population to determine areas requiring specific control activities.

3.3 Methods

3.3.1 Study Area

The research was conducted from October 2002 to April 2004 in two malaria-endemic villages in Ghana: Galo-Sota in the Keta District and Obosomase in the Akuapim North District. Keta District is located in the coastal savannah vegetation zone of the Volta region, where about a third of the total surface area is covered with lakes and ponds. The district has a population of 137,751 (Government of Ghana national population census 2000). The Anlo

people constitute the vast majority of people in this district (98.8%). The Anlo people are part of the Ewe-speaking people of Ghana (Keta District Annual Report 2001). They are patrilineal, and predominantly subsistence food crop farmers, but many also cultivate shallot, a tropical spice grown commercially. Some are also fishermen and petty traders.

Galo-Sota and its environs is a rural village with a population of about 6,000 to 7,000. A tributary of the Volta River passes through and divides the village into two, Galo and Sota, which collectively constitute Galo-Sota. There is a health post in the centre of the village, which is staffed by a midwife, two community health nurses and two auxiliary workers. Malaria was the most common health problem treated at the community health post in 2002.

The Akuapim North District in the eastern region of Ghana is situated in the forest zone. The district population is 113,915, according to the last census (National population census 2000). The Akuapim-Twi speaking people predominate, and they are mainly food crop farmers and petty traders. Oil palm, a cash crop, is cultivated on a limited scale. The district is currently being prepared as a site for a malaria vaccine trial. A Centre for Scientific Research into Plant Medicine is located in the district (Akuapim North District Annual Report 2001).
Obosomase (population 7,000 to 8,000) is the rural study village in the Akuapim North District. It has a community clinic staffed by a midwife, a community health nurse and one auxiliary staff. As in Galo-Sota, malaria was the most common health problem treated at the community clinic in 2002.

3.3.2 Study Methods

A better understanding of local malaria-related illness in children and pregnant women requires a study to appreciate the insiders' perspective (emic) on topical issues of experience, meaning and behaviour. To achieve this, various data collection methods were used, as described below:

3.3.2.1 Free Listing And Rating

Free listing and rating is a semi-structured techniques, and can be conducted as part of an interview, or as a written exercise. It is used to understand the contents and scope of a domain (Sinha 2003; Borgati 1998). In our study, it was conducted as a written exercise and

was employed to identify and understand the contents and scope of common illnesses in the communities. Twelve participants (equal numbers of men and women) took part in these free listing and rating exercises. After individual sessions, participants were asked to discuss the individual reports as a group to form consensus on common illnesses and their perceived importance. This technique identified priority illness categories, about which we inquired in the course of subsequent focus group discussions and in-depth interviews.

3.3.2.2 Participatory Social Mapping

Social mapping is used to present information on village layout, infrastructure, demography, ethno-linguistics groups, health patterns and wealth distribution. (Hardon *et al*. 2001). In our study, this approach was used to map out perceived mosquitoes breeding sites and malaria risk areas in the communities. During the mapping (sketch) exercise, villagers were asked to locate areas of particular risk, which included water bodies and other receptacles in which mosquitoes could breed.

3.3.2.3 Focus Group Discussion

Focus group discussions (FGDs) has been widely used in qualitative and behavioural research (Murphy *et al*. 1992; Hardon *et al*. 2001; Rubin and Rubin 1985) This method was used to facilitate interactive social processes, to elicit divergent viewpoints, and to observe the consensus-building process on issues concerning malaria-related illness (Lunt and Livingston 1996; Hardon *et al*. 2001). FGD participants were randomly selected and grouped according to age groups and sex; experience has shown this grouping to facilitate free and open discussions in rural Ghana. Four FGDs for each of the three age categories (11-17, 18-30 and 31 and above years) of men and women were held in each community.

3.3.2.4 Key-informant in-depth interview

For detailed individual accounts, in-depth interviews were held with selected key-informants. Questions were open-ended as we aimed at qualitative narrative accounts of the individual (Hardon *et al*. 2001). This enabled us to probed further issues that were raised during focus group discussions. There were 4 sessions with the chiefs and elders, 2 with women's leaders (a queen mother and another woman identified by community members), 4 with pregnant women, and 4 with caretakers or mothers of children under five years-of-age. In all, 14 interviews were conducted in each community. Results were triangulated and for the most

part consistent and were therefore presented together. Any notable differences, however, were noted and discussed.

3.4 Results

3.4.1 Common Illnesses

Table 1 presents approximate English translations of the common illnesses identified by respondents. Among the illnesses reported, malaria fever was considered the most common health problem in both communities. This was a consistent finding from free listing and rating sessions, FGDs, and in-depth interviews. The remarks of a pregnant woman in Obosomase were illustrative: "*Anytime I am pregnant like this, atridii is what worries me most; it attacks me very frequently, sometimes every two months, even though I have been going to the clinic for treatment*."

Respondents further categorised fever into three. These are malaria fever (known locally at Obosomase as atridii/ ebun/ fever/ huraye/ malaria and at Galo-Sota as asra / *ŋdudza/ fever/malaria*), jaundice fever and yellow fever. Furthermore, malaria fever was grouped into common/ordinary fever or male fever. The male fever was characteristically very difficult to cure. It could make affected persons behave wildly, as though they were mad. Ordinary malaria was regarded as the most common type of fevers, and could be easily treated with either herbal or biomedical medicines, or taking both together. Convulsion, known locally as *sroyare* (sky illness), *aditorso* (possessed) or *atridii barima* at Obosomase and *dzifodo* (sky illness) or *hevitsoame* (taken by a bird) or *adukpodzi* (rubbish dump) at Galo-Sota, was among reported childhood illnesses.

Table 1. Approximate English translations of common illnesses reported.

Under five 5	Pregnant women
Asthma	Asram*
Bodily pains	Dizziness
Boils	Headache
Convulsions	Heart problems
Coughing	HIV/AIDS
Diarrhoea	Jaundice
Headache	Swollen legs/arms
HIV/AIDS	Lower abdominal pains
Jaundice	Weakness
Malaria	Stomach problems
Measles	Malaria
Runny nose (Cold)	Vomiting
Skin infections/rashes	Rheumatic pains
Stomach problems	Waist pains

* Asram is a folk illness which was reported to start mostly on the breast of pregnant women/breast feeding mothers. It usually makes the breast to swell and when it affects a child, he/she will grow lean, his/her head will grow abnormally big and be divided into two by a line mark.

3.4.2 Causes Of Malaria-Related Illness

Various causes of MRI were reported and prominent among them were mosquito bite, heat from the sun/fire, eating too much fatty/oily food, hard/strenuous work/play and worm infections. Prominent causes reported for convulsions were malaria fever, evil spirit, worm infections, phlegm, and mosquito bites (table 2).

Table 2. Approximate English translations of the causes of malaria fever and convulsions[1].

Causes malaria fever	Causes of convulsions
Breast feeding	Breast feeding mother working in the sun
Cold weather or beaten by rain	Convulsions
Dirty environments	Dirty environment
Drinking unclean water	Evil spirits
Eating at the wrong time	Malaria fever
Eating oily/fatty food	Miss matches of food and blood
Eating unbalanced diet	Neglected ancestral spirits
Evil forces	Not eating on time
Hard/strenuous work	Phlegm
Heat from the sun/fire	Shortage/ lack of blood
Houseflies	Staying on the bare floor for long
Mosquito bites	Unbalanced diet
Other biting flies/insect	Worm infections
Part of God's creations	
Poor personal hygiene	
Starchy foods	
Unripe/premature fruits	
Worm infections	

[1] Columns sorted on alphabetical order Signs and symptoms of malaria-related illness

Respondents mentioned various local signs and symptoms for MRI (table 3). An illustrative account from a woman referring to malaria fever explained: "*When you have asra, your body will be very hot; you will be vomiting and cannot eat well, because you taste bitterness in your mouth*." Another woman referring to convulsions lamented: "*A child with convulsions become very hot and stiff. Sometimes the eye-balls shall be rolling with the eyes widely opened, the child could also be shaking and have locked jaws and look very weak*"

A serious attack was explained as one that requires treatment from outside the home, at a clinic or hospital, and/or consulting local healers.

Table 3. English translations of signs and symptoms of malaria fever and convulsions.

Malaria Fever	Convulsions
Paleness	Stiffness
Easily startled*	Unconscious
Weakness	Excessively hot body
Yellowish eyes and urine	Whitish eyes
Chills and rigors	Rolling of the aye balls
Bitterness in mouth/loss of appetite**	Easily startled
Headache**	Foaming mouth
Sweating profusely	Locked jaws
Diarrhoea	Breathlessness
Refusal of foods*	Folded arms
Vomiting	Stretching or shaking
Sleepiness	General weakness
Dizziness**	
Excessive hot body	

* Mentioned for children only

** Mentioned for pregnant women only

3.4.2 Home-Based Management Of MRI

First actions usually taken when a child is suspected of having MRI without convulsions included giving drugs, chiefly chloroquine and analgesics (either purchased from a shop or available as a leftover at home), or giving herbal medications for drinking, as enema, steaming (steaming involve covering the patient with thick blanket with a bucketful of hot water, sometimes with a red-hot stone dropped into it, for the patient to inhale and absorb the steam or vapour that comes out of the water till it cools down and the patient will come out full of sweat to take a cool bath). In case of 'excessive hot body' (fever), cold water is used to shower the child to bring down the high temperature. Some of these actions could reportedly be taken together, and the duration of any particular home treatment depends on how the child responds to it. In most cases, however, 2 or 3 days might pass before seeking outside treatment if the condition persists. But if it improves, then home treatment is continued until the child fully recovers. Pregnant women are not allowed to take medications neither herbal

nor biomedical without advice from “experts”.

However, when convulsions set in, very little is done in terms of giving biomedical drugs at home. At that point, home treatment reported includes giving herbal medicine (drinking, enemas, smearing on the body or squeezing herbal juice into the nostril of the child). Others interventions at home were scarification, giving baths or showering the child with cold water left overnight in a cooking pot, and inserting an object or a finger, into the throat of the child to induce vomiting. Others involved burning herbs to keep away the causal spirits, covering the child with a menstrual pad (usually a piece of cloth used by rural ladies to soak up menstrual blood). Although, most adults in the study communities could manage convulsions, it is only recognised local healers that could protect children from subsequent attack after treatment.

Caretakers (usually a mother) informs the father of a child MRI. In the absence of the father, the mother or mother-in-law is informed. Treatment, often with medications, typically begins before informing the child’s father or another authoritative person. The head of the household, who were mostly men or their representatives, usually decide on the type of treatment to seek from outside the home. Children’s mothers might also occasionally buy drugs from the vendors before informing their husbands or the father of the sick child.

3.4.3 Social Support

Social support through visiting and empathy are always available from relatives in response to ill health. Financial support, on the other hand, was not readily available, but for a more serious/severe illness, one can get some financial support from close relatives in the form of loan, which has to be paid back, even if the sick person dies. It was however, reported by the female FGD group (18-30) at Obosomase that it is becoming easier to get financial assistance from the church during illness than from family members. A respondent presents this view when she said: “*When you are not well and do not have money, you can borrow some from your relatives, but the person must be convinced that you are really sick, that is the illness must be very serious or severe else you may not be assisted. In fact, it is very easy to raise money to organise funerals in this community than for anything else*.” It was revealed that money advanced for funerals were more likely to be paid back from the funeral donations or by close relatives of the deceased person, but this was not the case with money given to people during illness.

3.4.4 Treatment Of MRI Outside The Home

Two main sources of outside treatments were reported by respondents. These were clinic/hospital attendance and consulting local healers. A mother at Galo-Sota summed-up the treatment-seeking behaviour: "*When my child is having asra I usually give herbal medication either as enema or for drinking for two or three days, and if the child is not getting well, then I buy drugs from the vendors for him or her. I will only take the child to the clinic when the asra persisted after doing all these for about 3 days*" Convulsions can be treated effectively at the clinic/hospital, but those caused by the spirits require the consultation of local healers to drive away the causal spirit to make biomedical treatments effective. Villagers were confident that local healers are able to treat convulsions, and protect children from subsequent attacks.

Generally, treatment at the clinic or hospital is preferred over other available treatment options. This was so because at the clinic/hospital people were sure of receiving appropriate drugs, which were expected to bring on recovery within two to four days. However, respondents maintained that they cannot afford to take every suspected malaria episode to the clinic/hospital because of the expense. The reported cost ranges from ¢20,000 to ¢30,000 cedis ($ 2.50 and $3.75) at the clinic, and between ¢80,000 and ¢150,000 cedis ($ 10 and $18.75) at the hospital per visit. Depending on the severity of a suspected illness, healers mostly treated MRI just for a token or a freewill gift. The cost of treating suspected cases with drugs at home was difficult to estimate by caretakers because it does not follow any pattern, and was made more difficult by the use of leftover drugs, for which it was difficult to specify cost.

It was reported that drugs could be bought with as little as ¢200 cedis ($0.025) from drug vendors. Also credit worthy customers could obtain drugs on credit from the vendors. The cost of drugs and credit facility available from the vendors has made it an attractive source for health seeking outside the home for MRI. Villagers at Obosomase reported keeping less drugs at home compared to Galo-Sota because they believe that drugs are more properly stored in the shops than at home. At Galo-Sota, there are no permanent drug shops and the people largely relied on itinerant drug vendors.

3.4.5 Treatment Failure

Respondents attributed treatment failures to evil spirits or the mismatch between medications and a particular patient's blood. A respondent at Obosomase offered the following fatalistic account of treatment failures: "*If the atridii will kill you, it does not matter how much medicine you take, whether it is herbal or biomedical, it will kill you. For instance there are people who do not respond to biomedical drugs and there are some who also do not respond to treatments from local healers. So I think that the failure of medicine to cure a person depends on the person's blood.*"

3.4.6 MRI Effect On The Blood Of Patients

Villagers explained that malaria drains the blood of patients, resulting in a shortage of blood. An opinion leader at Obosomase explained: "*The more you suffer from atridii the more your blood level reduces because it drains your blood. As a parent, I know of all these things, because my children have gone through it several times.*" Another reason given for the relationship between suspected malaria and shortage of blood was that malaria causes loss of appetite, and patients do not eat well. A pregnant woman at Galo-Sota said "*I was admitted at the hospital recently for asra and was given blood (transfusion), and when I was discharged they gave me blood tonic to take home for drinking. So I knew that it was the asra which has affected my blood because I was eating all the foods they told me to eat when I went home*".

3.4.7 Prevention And Control

Generally, respondents indicated fatalistic views and were sceptical about the capacity to eradicate malaria-related illness, because the disease is also a feature of God's creation. They believe, however, that something could be done to reduce its frequency in the community, especially for children. Measures considered capable of reducing malaria attacks include taking medication (both herbal and biomedical) regularly, protecting oneself from mosquito bites, eating well-balanced foods, staying less in the sun or near the fire, taking good care of oneself, cleaning the environment, and protecting foods from being contaminated by houseflies. An elderly man in an FGD group at Obosomase said, "*We*

cannot eradicate atridii from attacking us completely, but we can reduce the frequency of attack in the community by taking good care of ourselves, especially the children. The problem is that we shall continue to work in the sun, and mosquitoes will continue to bite us".

3.4.8 Comparing MRI In Children And Pregnant Women

It was reported that malaria was more common in children and pregnant women than for any other segment of the population. Children, however, were regarded as more vulnerable, and suffered more frequent attacks than pregnant women. Villagers acknowledged the dangerousness of malaria for pregnant women explaining that because the child draws on the blood of the mother it makes her vulnerable to adverse effects. The blood of a pregnant woman must sustain two (or more) persons and therefore cannot withstand illnesses like malaria. A lady at Galo-Sota said, "*Pregnant women get asra frequently because once you are pregnant you are already ill, and therefore susceptible to all form of other illnesses*". Another respondent at Obosomase said '*When you are pregnant you feel the heat in the system more than those who are not pregnant, and this result in suffering from atridii. In my case, I have to sit outside every night for the dew to cool me down before I go to bed*".

Another treatment, referred to as 'water ritual' is described by a respondent in Galo-Sota: "If a child is having a convulsion and loses consciousness, we throw water onto the roof, and the child is placed under the dripping water from the rooftop, as we call out the name of the child. This makes the child to cry out, which signals relief." During an informal discussion with an elderly woman at Galo-Sota, she explained that a spirit believed to cause convulsions also hates unhygienic conditions or filth, hence, the use of the menstrual pad to cover the child, and also the use of the name rubbish dump for convulsions. These metaphors are believed to drive the spirit away for medications to be effective.

3.4.9 Presence Of Mosquitoes

Mosquitoes were considered a major nuisance because of their noise and biting. Respondents at Galo-Sota said their community '*is the breeding ground for mosquitoes in Ghana*' and that '*mosquitoes are in control of the village*,' but it was different in Obosomase where it was reported that until recently mosquitoes was not a major problem in that community. The presence of mosquitoes in both communities was attributed to many

stagnant water bodies and other receptacles, especially tin cans. These environmental factors were consistent with areas mapped out during participatory mapping exercise identifying respondents' perceptions of the location of mosquitoes' breeding sites.

Mosquitoes were reported to cause malaria, jaundice and itching. Additional illnesses like measles, sleeping sickness and diarrhoea/cholera were reported at Galo-Sota. A female discussion group (18-30 years) at Obosomase also reported that mosquitoes could cause convulsions. Community members protect themselves from mosquito bites by burning coils and herbal repellents at night, screening windows and doors with nets, and swatting with cloths. Others use electric fans and a limited use of insecticide spray, burning of cow dung, sleeping under bednet and sprinkling kerosene in rooms. Most of these protective measures, however, were considered relatively ineffective, and they could offer no more than partial protection.

3.4.10 Bednet Use

Villagers in Obosomase reported that only a few people slept under bednets, but in Galo-Sota most people slept under them, however, these were untreated nets. All but one respondent at Galo-Sota had heard about treated bed-nets on the radio, and all except one at Obosomase said they would like to own treated bednets if they could afford to pay for them. One respondent who would not want to own one said she feels uncomfortably hot under it. Suggested affordable prices ranged from ¢10,000 to ¢40,000 at Obosomase and between ¢20,000 and ¢60,000 at Galo-Sota for a large size net (exchange rate at the time of the study was $1= ¢8,000). Willingness to pay such a price reflected the perceived importance of bed-nets in both communities.

3.5 Discussion

This study has shown that MRI was well-recognized common health problem affecting children, and pregnant women in the communities studied. The home is the starting point for the treatment of MRI using herbs prepared at home, analgesics and chloroquine or other available antimalarials. These antimalarials were mostly leftovers from previous treatments that were purchased from local drug vendors without prescription. Such practices are wide-spread in Ghana and other communities in sub-Saharan Africa, and have been reported in

other studies, indicating inappropriate use (Deming *et. al.,* 1989; Rooth & Bjorkman 1992; Snow *et. al.,* 1992; Ruebush *et. al.* 1995; Mwenesi *et. al*., 1995; Ahorlu *et. al.,* 1997; Dunyo *et. al.,* 2000). However, the use of antimalarials at home have not been fully measured or evaluated to ascertain its appropriateness as suggested in most studies, and this needs further research.

Respondents were aware of drug failures, though they have attributed it to reasons other than resistance, it emphasises the need to hasten the process of changing the first-line drug to a more efficacious combination therapy before people begin to loss confidence in biomedicine (Helen Frankish, 2003). This is particularly important at a time when the mosquito theory is beginning to sift through; community members' belief on causes of malaria and the role of antimalarials are becoming more important. If people begin to loss faith in the recommended drugs, this may seriously compromise the effectiveness of control programmes that rely on timely treatment.

It must, however, be accepted that the use of biomedicine including chloroquine has come to constitute a routine practice in fever management in the communities (Ahorlu *et al* 1997). Rather than trying to stop ill-informed use of antimalarials, opportunities should be considered to repackage antimalarials in such a way that may enhance appropriate and rational use at the household and community levels. This is where the recent approach to scale-up home management of malaria (TDR New 67, 2002) should be considered a step in the right direction. This is important if the target to have at least 60% of patients accessing prompt affordable and appropriate treatment within 24 hours is to be achieved.

Another concern is how to supervise and monitor the activities of drug vendors who are major sources of antimalarials in the communities. However, at Obosomase, the most problematic vendors (itinerant peddlers) were no longer operating because they have been pushed-out of business by drug shop operators, who are easier to supervise and monitor. It has been demonstrated by Marsh *et al*. (1999, 2004) that training of shop-keepers in Kenya resulted in improved quality of prescriptions they filled, and better customer adherence to treatment.

Consistent with findings from other studies in Ghana (Agyepong, 1992, Ahorlu *et. al.,* 1997), perceived causes and preferred treatments that are locally relevant, but inconsistent with biomedical accounts still persist in our study villages. A new observation, however, was that the role of the mosquito as a major agent of transmission is gaining ground and this should offer a window of opportunity for delivering control measures aimed at protecting individuals from mosquito bites. Mutually contradictory ideas, however, coexist among the villagers we studied, like reports from Hausmann *et al.* (2002) from research in the Kilombero region of Tanzania, but interventional messages should aim at promoting desired behaviours instead of focussing on changing what seem irrational to the professionals. We should not make the mistake of equating rationality with appropriateness, because what may seem irrational to us may as well be rational and relevant to the local population.

The readily available access to drugs from drug shops influences home drug storage practices. Whiles few respondents at Obosomase stored drugs at home, many at Galo-Sota kept various drugs including antimalarials in the home, because they do not know when a drug peddler might be available. Consequently, policy should incorporate drug vendors, especially the shop operators, into the control programme if one of the Abuja targets (thus, 60% of those suffering from malaria have prompt access to and are able to use correctly, affordable and effective treatment within 24 hours of symptom onset) is to be realised at the close of 2005. Other studies have alluded to this (Ahorlu *et al* 1997; Marsh *et al* 1999, 2004).

Local ideas about the effect of malaria on the blood of affected persons may encourage the acceptance of intermittent preventive treatment (IPT) of malaria during pregnancy and the need to take the full course of treatment. The message should be that the medicine will strengthen the blood of pregnant women to better fight illness in general, but malaria in particular. Policy should also consider introducing IPT for children under five years-of-age, since they are by far the most vulnerable segment of the population. The only fear is that, if not carefully and appropriately delivered, it may lead to abuse or misuse of the drug of choice. This calls for appropriate health education not only on the need to strengthen the blood of individuals through the use of drugs to fight malaria, but also the need to take the full course of treatment as well as the negative effect of inappropriate use of antimalarial drugs.

The link between convulsions and malaria was widely acknowledged, and the report that it

could be effectively treated at the health facility should offer a new hope for convulsion managements in the context of primary health care. The explanations that convulsions caused by spirits could be treated after rituals are performed by traditional healers to drive away the causal spirits should offer hope for intervention to encourage timely treatment for convulsive cases. This hope should be found in collaboration between the formal and traditional sectors to practice simultaneous healing. The collaboration should emphasize that the traditional healer should be consulted in proxy for the patient while he/she is sent to the health facility to received timely treatment. All over Ghana, proxy consultations are done on behalf of seriously ill people (unpublished observation), so this should not be too difficult to accept by both caretakers and traditional healers. The emerging link between malaria, mosquito and convulsions, and the prominence given to modern treatment at health facility departs from other reports from sub-Saharan Africa, where only a limited links were reported between malaria and convulsions, and treatments were mostly sought from traditional healers (Hill et al. 2003; Adongo et al 2005; Baume et al. 2000; Ahorlu *et al*. 1997; Hausmann *et al.* 2002).

The desire to prevent mosquito bites due to its ability to cause illness and nuisance should be recognized and acknowledged in interventions to introduce insecticide treated materials into the communities. At Galo-Sota, bednet usage was a rule rather than exception, but these nets were not treated and therefore do not provide full protection to the users (Aikins *et al*. 1994). At Obosomase where fewer people are using bednets, the reported usage of net materials to screen windows and door-ways must provide an opportunity to have these screening materials treated while encouraging the people to provide bednets for children under five years-of-age and pregnant women as currently envisage in the national control programme (Ghana Health service 2004).

The lack of resources for sustainable malaria control, the current spread of parasite resistance to chloroquine (which is still a cheap and widely used drug in Ghana) and the elusiveness of vaccine development indicate needs for innovative ways to make the use of existing tools more effective and sustainable. This can be possible when households and community members are appropriately integrated into the malaria management and control process. Attention should focus less on what they are not doing appropriately and focus more on emphasizing what they can do effectively to cope with malaria; bearing in mind that home

and community management or self-treatment with biomedicine and herbal medications will remain persistent features of community help-seeking for malaria-related illness.

This study shows how appreciation of the context of community experience, meaning, and health-seeking behaviour may help to guide malaria control. We must be aware that community experiences, meanings and behaviours are not static, but always changing. As communities go through daily experiences, coupled with new information, formerly held interpretations and meanings will change, and this will continually influence the behaviour of the individual and the community at large. The study highlights sociocultural features of malaria in two rural Ghanaian communities, and it indicates needs for regular re-evaluation of community experiences, meanings, and behaviours to regularly review and adapt control programmes to the changing needs of the local people and communities.

Chapter 4: Sociocultural Determinants Of Treatment Delay For Childhood Malaria

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4.1 Abstract

A study of sociocultural determinants of timely appropriate treatment seeking for children under 5 years-of-age suspected of having perceived febrile malaria-related illness (PFMI) employed cultural epidemiological methods with EMIC interviews. EMIC interviews are instruments for assessing representations of illness or specified health problems from the perspective of affected persons, and their family. Caretakers of children with suspected malaria were interviewed about illness-related experiences, meanings, and behaviour in two endemic villages in southern Ghana. We found that only 11% of children suspected of having PFMI received timely appropriate treatment consistent with the Abuja target of treating malaria within 24 hours of illness onset, and 33% of the children received appropriate treatment within 48 hours. Reported perceived causes of *phlegm* predicted timely, appropriate treatment within 24 hours of illness onset ($p = 0.04$) in a multivariate logistic regression model and *playing on the ground* ($p < 0.01$) within 48 hours. Two categories of distress; *paleness or shortage of blood* ($p = 0.05$), and *sweating profusely* ($p = 0.03$) also predicted timely, appropriate treatment within 24 hours in a multivariate logistic regression model. Knowing that mosquitoes transmit malaria was not associated with timely, appropriate help-seeking for the children, even though such knowledge may promote personal protective measures, especially use of bednets. Patterns of distress and perceived causes were related to timely, appropriate help seeking, but not as expected. Effects on health-seeking of illness-related experience, and meaning are complex, and explaining their role may strengthen interventions for childhood malaria.

Key words: Malaria; timely, appropriate treatment; cultural epidemiology; patterns of distress; perceived causes; help-seeking behaviour, Ghana

4.2 Introduction

Malaria is a threat to more than 40% of the world's population and responsible for more than 300 million acute cases each year, resulting in over 1.2 million deaths in 2002 (WHO, 2004). About 90% of morbidity and mortality occurs in sub-Saharan Africa, and it has been well documented that children under five and pregnant women are at highest risk (WHO, 2000). Malaria is known to constitute 10% of the disease burden of sub-Sahara Africa and accounts for about 25% of all childhood mortality. It is also widely recognized that despite global,

national and local initiatives, this situation is not improving quickly enough (Korenromp *et al*. 2003; WHO 2003; Sachs and Malaney 2002; Sachs 2002), and case rate may double over the next 20 years (Bremen 2001) Prompt recognition and effective treatment of malaria is a critical element of malaria control strategies (WHO 2000).

In Ghana, malaria is the most common cause of death in under-five children (MOH 1999). It is ranked first among the ten diseases most frequently seen in most health facilities in the country. According to official drug policy, the first line drug for treating uncomplicated malaria was changed in January, 2005 from chloroquine to amodiaquine in combination with artesunate. However, the ministry is yet to take delivery of these new drugs for distribution (Ghana Health Services 2004), and chloroquine has remained the first line of treatment of malaria in the whole country. Due to widespread poverty, however, many households depend on a combination of herbs and over-the-counter drugs usually consisting of inadequate doses of chloroquine and analgesics (Ahorlu *et al*.1997; Agyepong 1992). In Ghana, as in other parts of sub-Saharan Africa, where malaria is due mainly to *Plasmodium falciparum* and potentially fatal, early and effective treatment saves lives by preventing disease progression to severe malaria (WHO 2003). Dunyo *et al*. (2000) reported from southern Ghana that parasite density was 4 times higher in health centre cases of malaria compared to home diagnosis mainly because cases arrived at the health centre late (between 1-14 days of illness onset)

At the year 2000 meeting of African Heads of States in Abuja, Nigeria, it was declared that by the end of year 2005, at least 60% of those suffering from malaria should have easy access to appropriate, affordable treatment within 24 hours of the onset of symptoms (WHO 2000). Community-level interventions to strengthen home management of children with fever are being promoted in an effort to improve access to prompt treatment, particularly in isolated rural areas (Marsh *et al*. 1999; Marsh *et al*. 2004; WHO 2003). A number of studies have demonstrated that home treatment of malaria improves timely treatment (Sirima *et al*. 2003). Such programmes are not widely implemented in Ghana, especially in our study areas.

Helman (2000, p 219) points out that although surveillance of the community's health requires attention to health-related cultural beliefs and behaviours, it is difficult to quantify these cultural factors. Consequently, their study has been less attractive for epidemiological studies

in the absence of frameworks for assessing relationships between specific cultural factors and particular disease outcomes.

Factors such as distance to the health facility, inadequate drug stocks, and lack of money to pay for services are the most commonly reported reasons for delayed use or failure to use public health facilities (Jowett & Miller 2000; Williams & Jones 2004). Although ethnographic data suggest the use of traditional healers may delay effective treatment, some studies indicate that is not so (de Savigny *et al*. 2004). Questions remain about the role of cultural determinants of health-seeking that delay or promote prompt use of appropriate health care services providing treatment. As suggested in the Africa Malaria Report (WHO 2003), one expects high fever to motivate most caretakers to seek treatment for life-threatening illness in young. Since help-seeking may be influenced by sociocultural factors, we studied sociocultural determinants of prompt or delayed treatment-seeking for childhood illness identified by caretakers or health care providers as malaria. Our research examined the distribution of prompt appropriate treatment in the study communities, and it analysed cultural epidemiological variables specifying illness-related experience and meaning that explain delayed or prompt appropriate treatment seeking for malaria-related illness in children up to five years of age in rural communities in southern Ghana.

4.3 Study Area And Methods

4.3.1 Study Area

The research was conducted from October 2002 to April 2004 in two malaria-endemic villages in Ghana: Galo-Sota in the Keta District and Obosomase in the Akuapim North District. Keta District is located in the coastal savannah vegetation zone in the Volta region, where about a third of the total surface area is covered with lakes and ponds. The district has a population of 137,751 (Government of Ghana national population census 2000). The Anlo people (98.8%) are the vast majority of people living in this district. The Anlo people are a part of closely related dialects forming the Ewe-speaking people of Ghana (Keta District Annual Report 2001). The Anlo people are patrilineal, and predominantly subsistence food crop farmers, but many also cultivate shallot, a tropical spice grown in commercial quantity. Some are also fishermen and petty traders.

Galo-Sota and its environs is a rural village with a population of about 6,000 to 7,000. There is a health post in the centre of the village, which is staffed by a midwife, two community health nurses and two auxiliary workers. Malaria is the most common health problem treated at the community health post in 2002. A tributary of the Volta River passes through the village and divides the village into two, Galo and Sota, which collectively constitute Galo-Sota.

The Akuapim North District in the eastern region of Ghana is situated in the forest zone. The district population is 113,915, according to the last census (National population census 2000). The Akuapim-Twi speaking people predominate, and are mainly food crop farmers and petty traders. Oil palm, a cash crop, is cultivated on a limited scale. The district is currently being prepared as a site for a malaria vaccine trial. A Centre for Scientific Research into Plant Medicine is located in the district (Akuapim North District Annual Report 2001).

Obosomase (population 7,000 to 8,000) is the rural study village in the Akuapim North District. It has a community clinic staffed by a midwife, a community health nurse and one auxiliary staff. As in Galo-Sota, malaria is the most common health problem treated at the community clinic in 2002.

4.3.2 Methods

Field data were collected from October 2002 to April 2004 in the two communities. An EMIC interview was developed locally to study the relationship between sociocultural factors and appropriate treatment seeking for children up to 5 years of age. EMIC interviews are instruments used for assessing representations of illness or specified health problems from the perspective of affected persons, their family or community members. The instrument blends qualitative and quantitative approaches to study illness-related experience, meaning and behaviour (Weiss 2001; 1997). The design of this semi-structured interview was informed by baseline ethnographic data which generated illness narratives indicating locally relevant perceived febrile malaria-related illness (PFMI) categories of distress, perceived causes and help-seeking behaviours. We conducted 100 EMIC interviews in both communities with caretakers of children up to 5 years of age suspected of having PFMI.

Respondents were purposively selected based on either the respondent's own identification of the illness as malaria-related or a clinic or hospital diagnoses. Two inclusion criteria were

required: (1) a child in the participant's care has been ill (symptomatic) with PFMI for at least 3 days, (2) the child in the participant's care has recovered and become symptom-free for PFMI within the last 7 days prior to the day of interview. A few children identified in the community with suspected PFMI for less than 3 days were referred to the clinic for free treatment, but not included in the study. None of the caretakers contacted refused to participate in the study. Interviews were conducted by the first author in the local languages, and data were recorded by a research assistant who has a degree in Sociology and was trained in qualitative and quantitative research methods. The EMIC instrument was pre-tested to gain experience and refine it. The pretesting showed it was unnecessary to tape record the interviews. Interviews were conducted by an interviewer and a second person completed the data sheet, both coded items and narrative reports.

4.3.3 Data Analysis

Data from the two communities were pooled for this analysis. Qualitative narrative data were entered into a word processor (Microsoft Word) and imported in a format that allows automatic coding by interview item in MAXqda, a programme for textual analysis. These data were analysed to clarify aspects of illness-related experience, meaning and behaviour. Variables of interest in the quantitative data-base were imported into MAXqda as selection variables. This enabled us to perform a phenomenological analysis of relevant coded segments from selected respondents to complement and clarify the meaning of categories that were analysed with quantitative methods.

Quantitative data were entered in Dos EpiInfo 6.04 and subsequently analysed with the windows updated version 3.3. We examined the frequencies of spontaneous and probed coded cultural epidemiological variables of perceived signs and symptoms (PS), perceived causes (PC), self-help at home (SH) and outside help-seeking (HS). We then computed prominence values for PC and PS variables for analysis of association with timely appropriate help seeking. To specify the relative prominence of each category of malaria-related illness experience, meaning and behaviour, spontaneous responses to open-ended questions were assigned a prominence of 2, a prominence of 1 if mentioned only after probing, and a prominence of 0 if not mentioned at all. The single most important PS and PC contributed an additional value of 3 to the prominence, yielding a total prominence for each category ranging from 0 to 5. Prominence was computed for HS and SH variables based solely on whether

they were reported spontaneously or in response to probes as used for the current PFMI.
We analysed appropriate treatment, defined by consulting a trained provider (i.e., any person who received any form of a recognised training, formal or informal, on recognition or diagnosis, and management or treatment of illness, including village health workers). We analysed determinants of treatment within 24 and 48 hours, and after72 hours. The use of 24 hours was based on the target set by African Heads of States and Governments in the Abuja declaration (WHO 2000). Going by this definition of appropriate treatment, only two reported sources – community clinics and government hospitals, met the criteria and were labelled appropriate treatment in the analysis. We then computed the bivariate relationship between appropriate help seeking and cultural epidemiological explanatory variables denoting prominence of PS, PC, HS, and SH variables for these time frames. Variables for consideration in logistic models to identify determinants of appropriate treatment-seeking within selected time frames were identified by suggestive bivariate relationships ($p \leq .20$, Wilcoxon text).

4.4 Results

Data from the two communities were pooled for this report because analysis shows that, apart from the local terms and names used to describe the conditions, similar experience, meanings and behaviours were reported by the two ethnic groups. Various local names and terms were used to describe the febrile illness studied, as shown in Table 4. These names were used interchangeably to refer to conditions such as hot body, yellowish urine, yellowish eyes, vomiting, cold and shivering, bodily pains, weakness, refusal of food, easily startled, paleness, weight loss etc.

Caretakers studied included 98 women (98.0%) and 2 men. The mean age (± sd) of respondents was 29.4 (± 7.9) years, ranging from 16 to 52 years, and the median age was 27 years. Respondents were made up of 50.0% Akuapim Twi speaking and 50.0% Anlo Ewe speaking people. A great majority of respondents were married (79.0%), and 8.0% had never been married; 9.0% were separated or divorced and 4.0% were widowed. Most respondents had some education (77.0%), and the mean (± sd) years of education was 5.4 (± 4.0) years, ranging from 0 to 13 years; the median number of years was 6. Thus, 23.0% of respondents had no education. Household income was reported to be regular and dependable (16.0%),

possibly regular and dependable (44.0%), uncertain (14.0%) and irregular or undependable (26.0%). Main occupation of respondents was petty trading. Most frequently reported occupations reported for spouses were fishing or farming, or professional activities such as masonry and carpentry.

At the time of interview, 56.0% of the children were symptomatic for 3 days or more, and the mean (± sd) days of illness was 5.5 (± 1.6); 44.0% had been asymptomatic for 7 days or less with the mean (± sd) of days 4.8 (± 1.7). The ages of the children ranged from 1 to 5 years (mean (± sd) of 2.1 (± 7.9). The sick children included 38.0% females and 62.0% males.

Overall, only 11.0% and 33.0% of the children received appropriate treatment within 24 and 48 hours respectively from the onset of symptoms of malaria-related illness, leaving 67% of the children either receiving appropriate treatment after 72 hour, or no treatment at all by the time of interview. Majority of the caretakers (67.0%) purchased drugs from various licensed and unlicensed sellers for their children, and out of this number, only 9.2% sought appropriate treatment within 24 hours, and 29.4% within 48 hours. Fifty-five percent, (33.0% reported spontaneously and 22.0% after probing), said they used tepid sponging, and among them, 51.5% (33.3% for spontaneously and 18.2% after probing), sought appropriate help within 48 hours. Other self-help actions included use of leftover antimalarials, other drugs, and herbal medications; these were reported only by a few caretakers, and they were unrelated to timely, appropriate treatment seeking. Eighty-nine percent of the caretakers either sought help from the *government hospital* or *community clinic*, among them only 16.9% and 44.9% went to these providers within 24 and 48 hours respectively. The distribution of appropriate health seeking for children up to 5 years of age among caretakers reporting various categories of PS, and PC are presented in tables 5 and 6

Table 5. Local terms and their approximate English equivalents[1]

Obosomasi (Twi speaking)		Galo-Sota (Ewe speaking)	
Twi Terms	Approximate English equivalents	Ewe Terms	Approximate English equivalents
Atridii Ebun	Hot body, yellowish urine, yellowish eyes, Vomiting, cold, and shivering,	Asra Nudza	Hot body, yellowish urine, yellowish eyes, Vomiting, cold and shivering,

Feve Malaria	bodily pains, weakness, refusal of food, easily startled, paleness, weight loss, etc	Fever Malaria	bodily pains, weakness, refusal of food, easily startled, paleness, weight loss, etc

[1]Local terms and names for PFMI have no single equivalent in English, and were used interchangeably to represent similar conditions. “Malaria” and “fever” have also been incorporated in local usage as terms and names

Table 6. Distribution of timely, appropriate health seeking among caretakers reporting various categories of distress (PD).

	Total sample		Percentage of respondents reporting category In each treatment delay group[2]					
			≤24 hours		≤48 hours		≥72 hours	
Number:	100		11		33		67	
Categories of distress[1]	Spon	Probe	Spon	Prob	Spon	Prob	Spon	Prob
Breathlessness	3	12	33.3	0.0	66.7	41.7	33.3	58.3
Chills and rigors	10	6	10.0	0.0	20.0	33.3	80.0	66.7
Crying	32	12	18.8	0.0	46.9	25.0 *	53.1	75.0 *
Diarrhoea	16	13	18.8	7.7	37.5	23.1	62.5	76.9
Easily startled	16	20	18.8	5.0	37.5	20.0	62.5	80.0
Headache	8	2	12.5	0.0	37.5	50.0	62.5	50.0
Hot body	86	10	12.8	0.0	32.6	30.0	67.4	70.0
Bodily pains	3	12	0.0	8.3	0.0	41.7	100	58.3
Refusal of food	58	14	10.3	7.1	31.0	35.7	69.0	64.3
Paleness	12	21	16.7	19.0 *	50.0	33.3	50.0	66.7
Sleepiness	7	5	0.0	0.0	0.0	0.0	100	100
Sweating	9	24	44.4	8.3 **	55.6	33.3	44.4	66.7
Vomiting	17	3	5.9	0.0	35.3	33.3	64.7	66.7
Weakness	37	15	8.1	26.7	29.7	46.7	70.3	53.3
Weight loss	20	33	5.0	15.2	20.0	42.4	80.0	57.6
Yellowish eyes	46	20	13.0	10.0	34.8	30.0	65.2	70.0
Yellowish urine	40	22	20.0	0.0 *	32.5	31.8	67.5	68.2

[1]Listed in alphabetical order

[2]Percentage in treatment delay groups of the number from the total sample reporting each specified category. Level of significance with reference to the total sample, indicating variables included for testing in the logistic regression model; p-value based on computation of prominence (see methods section): *p<.20, **p<.05.

Table 4. Distribution of timely, appropriate health seeking among caretakers reporting various categories of perceived causes (PC).

	Total sample		Percentage of respondents reporting category In each treatment delay group[2]						
			≤24 hours		≤48 hours		≥ 27 hours		
Number:	100		11		33		67		
Perceived causes[1]	Spon	Probe	Spon	Prob	Spon	Prob	Spon	Prob	
Airborne/exposure	11	6	9.1	0.0	27.3	33.3	72.7	66.7	
Cannot say/don't know	4	1	50.0	0.0 **	50.0	0.0	50.0	100.0	
Evil eyes or sorcery/charm	2	23	0.0	13.0	0.0	47.8	100.0	52.2	
Fatty/oily food	18	46	16.7	8.7	27.8	37.0	72.2	63.0	
Heat from the sun or fire	58	15	8.6	6.7	31.0	26.7	69.0	73.3	
Hereditary	5	40	0.0	12.5	0.0	35.0	100.0	65.0	
Houseflies	19	52	5.3	13.5	26.3	42.3	73.7	57.7	
Impure water	12	4	16.7	0.0	58.3	0.0	41.7	100.0	
Mosquitoes	69	22	11.6	9.1	30.4	40.9	69.6	59.1	
Others	6	0	0.0	0.0	33.3	0.0	66.7	0.0	
Part of God's creation	0	5	0.0	0.0	0.0	60.0	0.0	40.0	
Personal hygiene/not clean	18	12	11.1	16.7	33.3	50.0	66.7	50.0	
Phlegm	3	14	33.3	28.6 **	66.7	64.3 **	33.3	35.7	**
Physical exertion/hard work	22	3	4.5	0.0	22.7	33.3	77.3	66.7	
Playing on the ground	18	9	16.7	22.2 *	61.1	55.6 **	38.9	44.4	**
Sanitation/dirty environment	13	14	15.4	21.5 *	46.2	50.0 *	53.8	50.0	*
Spirits (witches, ancestral etc)	3	34	0.0	17.6	0.0	38.2	100.0	61.8	
Through breast feeding	8	6	0.0	0.0	12.5	33.3	87.5	66.7	
Too much rice/unbalanced diet	2	6	0.0	16.7	0.0	50.0	100.0	50.0	
Unripe/premature fruits	5	29	0.0	13.8	60.0	44.8 **	40.0	55.2	**

Worm infections	9	54	33.3	7.4		55.6	33.3 *	44.4	66.7 *

[1]Listed in alphabetical order

[2]Percentage in treatment delay groups of the number from the total sample reporting each specified category. Level of significance with reference to the total sample, indicating variables included for testing in the logistic regression model; p-value based on computation of prominence (see methods section): *p<.20, **p<.05.

The two most common causes of malaria-related illness reported spontaneously were *mosquito bites* (69.0%) and *heat from the sun* (58.0%). Most caretakers (69.0%) reported these categories of PC but did not bring children to treatment within 48 hours of illness onset. Illness narratives indicated that caretakers classified malaria caused by mosquitoes or heat as 'ordinary' malaria that could be dealt with at home, either with biomedicine bought from the shops or herbal preparations. The two most common causes reported after probing were *worm infections* (54.0%) and *houseflies* (52.0%). In this case, 33.3% and 42.3% received appropriate treatment within 48 hours of illness onset, slightly higher percentages than those who reported mosquitoes and heat, but not statistically significant. Narratives explained that worms and houseflies were associated with dirt or filth in the stomach, because houseflies contaminate foods before they are eaten. Malaria-related illness attributed to these causes was considered more serious than illness caused by mosquitoes or heat from the sun. It was also reported that dirt in the stomach could cause convulsions, which they considered very serious.

Categories of PS and PC with bivariate significant or suggestive relationship (p ≤.20) to appropriate help seeking within 24 and 48 hours, and after 72 hours (or none at all) were examined in logistic regression models to correct for confounding. The results of these analyses are presented in tables 7-9. Logistic regression models also considered SH and HS but none of these variables remained in the models. Furthermore, no PS variables remained in the models for appropriate treatment seeking within 48 and after 72 hours. PS prominence variables related to appropriate health seeking within 24 hours included *sweating* and *paleness/shortage of blood*. One respondent indicated the motivation for timely help-seeking: "It is the drastic rate at which my child is losing weight that is bothering me, and it is because he is not eating well and therefore is short of blood. You can even see how he is looking white and pale, as if there is no blood in his body."

The prominence of *phlegm* as a perceived cause showed a strong relationship to timely, appropriate help seeking for children under 5 years-of-age. The dynamics of the relationship were explained in the following representative qualitative account: "It is the difficulty in breathing due to choking from phlegm in the chest that is most troubling for me, because it could easily kill the child, or it leads to convulsions." PC variables, *playing on the ground* and *Phlegm* were significantly associated with appropriate help seeking within 48 hours of onset of illness. The following are representative respondents' comments: "Over here mosquitoes worry us a lot so it is a factor, but I think that my child has picked something from the ground and ate it when playing, which makes the condition more dangerous. What the child eats can also bring on this condition, so we must always be careful about food for children."

Table 5. Logistic Regression analysis of categories of distress (PD)) as determinants of timely, appropriate help-seeking within 24 hours.

Categories of distress[1]	Odds Ratio	95% C.I.		P-Value
Paleness/shortage of blood	1.98	1.00	3.94	0.05**
Sweating	2.57	1.11	5.94	0.03**
Yellowish urine	1.60	0.79	3.21	0.19

[1]Listed in alphabetical order.

**p ≤ .05.

Table 6. Logistic Regression analysis of categories of perceived causes (PC) as determinants of timely, appropriate help-seeking within 24 and 48 hours.

Perceived causes[1]	Within 24 hours				Within 48 hours			
	Odds Ratio	95% C.I.		P-Value	Odds Ratio	95% C.I.		P-Value
Cannot say	1.97	0.87	4.47	0.11	1.13	0.48	2.64	0.79
Dirty environment	1.18	0.61	2.29	0.63	1.10	0.63	1.91	0.74
Phlegm	3.17	1.07	9.33	0.04**	3.07	1.03	9.15	0.04**
Playing on the ground	1.21	0.74	1.96	0.45	2.10	1.29	3.44	<.01**
Unripe fruit					1.99	0.88	4.51	0.11
Worm infestations					0.86	0.53	1.38	0.53

[1]Listed in alphabetical order.

**p < .05.

Table 7. Logistic Regression analysis of categories of perceived causes (PC) as determinants of appropriate help-seeking after 72 hours.

Perceived causes (PC) [1]	Odds Ratio	95% C.I.		P-Value
Cannot say	0.89	0.38	2.08	0.79
Dirty environment	0.91	0.52	1.58	0.74
Phlegm	0.33	0.11	0.97	0.04**
Playing on the ground	0.47	0.29	0.77	<.01**
Unripe fruit	0.51	0.23	1.16	0.11
Worm infection	1.17	0.72	1.89	0.53

[1]Listed in alphabetical order

**p ≤ .05.

When PC and PS variables with indicative bivariate relationships to appropriate health seeking within 24 and 48 hours were put into a logistic regression model, two PC variables, *phlegm* and *cannot say*, and two PS variables, *sweating* and *yellowish urine*, had borderline relationships to timely, appropriate help seeking within 24 hours. However, two PC variables, *playing on the ground*, and phlegm were highly related to appropriate help seeking within 48 hours. PC variable, *playing on the ground* had related negatively to appropriate treatment seeking after 72 hours. Also, two PC variables, *phlegm* and *unripe fruit* had suggestive negative relationships to appropriate treatment seeking after 72 hours (table 10-11).

Table 8. Logistic Regression analysis of categories of distress (PD) and perceived causes (PC) as determinants of timely, appropriate help-seeking within 24 and 48 hours.

Categories of distress (PD) & perceived causes (PC)[1]	Within 24 hours				Within 48 hours			
	Odds Ratio	95% C.I.		P-Value	Odds Ratio	95% C.I.		P-Value
Cannot say (PC)	2.60	0.92	7.35	0.07*	1.05	0.43	2.55	0.91
Crying (PD)					1.06	0.67	1.69	0.80
Dirty environment (PC)	1.61	0.75	.43	0.22	1.17	0.63	2.19	0.62
Paleness (PD)	2.12	0.83	5.44	0.12				
Phlegm (PC)	3.14	0.83	11.90	0.09*	3.83	1.02	14.40	0.05**
Playing on the ground (PC)	1.13	0.66	1.93	0.65	2.53	1.35	4.72	<.01**
Sweating (PD)	2.17	0.85	5.52	0.10*				
Unripe fruit (PC)					1.92	0.77	4.78	0.16
Worm Infestation (PC)					0.75	0.44	1.27	0.28

Yellowish urine (PD)	2.12	0.96	4.70	0.06*	

[1]Listed in alphabetical order

*p ≤ .10.

**p ≤ .05.

Table 9. Logistic Regression analysis of categories of distress (PD) and perceived causes (PC) as determinants of appropriate help-seeking after 72 hours.

Categories of distress (PD) & perceived causes (PC)[1]	Odds Ratio	95%	C.I.	P-Value
Cannot say (PC)	0.87	0.38	2.03	0.75
Crying (PD)	0.87	0.56	1.35	0.53
Dirty environment (PC)	0.95	0.54	1.67	0.85
Phlegm (PC)	0.34	0.11	1.04	0.06*
Playing on the ground (PC)	0.47	0.29	0.77	<.01**
Unripe fruit (PC)	0.51	0.22	1.14	0.10*
Worm infection (PC)	1.16	0.72	1.87	0.55

[1]Listed in alphabetical order

*p ≤ .10.

**p ≤ .05.

4.5 Discussion

Other studies have shown that people may not seek early appropriate treatment for PFMI because of barriers imposed by poverty, such as inability to pay for both the direct and indirect cost of treatment, distance from treatment source, poor accessibility (including transportation problems), provider attitudes towards patients and inadequate drug stocks, (Jowett & Miller 2000; WHO 2003; Williams & Jones 2004). Our study however, shows that factors relating to experience, meaning and behaviour, or what Helman (2000, p 219) called cultural factors, must also be considered among determinants of prompt appropriate and effective treatment of young children. A majority of the children studied did not receive timely appropriate treatment; as only 11% of the children met the Abuja target of receiving appropriate treatment within 24 hours (WHO 2000). This must be worrying indeed, as it demonstrates that in rural communities, represented by our study areas, the target of 60% of suspected malaria patients (children under five) receiving appropriate treatment within 24

hours of illness onset may not be met by the close of 2005. Even getting children into appropriate treatment within 48 hours was well below the target set in Abuja (WHO 2000).

Although home-based treatment is increasingly emphasised in Ghana as an effective tool for controlling malaria mortality, it remains more a policy consideration that has not yet been implemented in the study communities. As these changes are implemented, however, future studies should consider not only timely, appropriate outside help-seeking, but also home-based treatment as a desirable outcome for preventing childhood mortality from malaria.

Our study shows that sociocultural factors are not just a function of magico-religious beliefs or even lack of the understanding of the role of mosquitoes in the transmission of malaria. It is a more complex interaction between beliefs, experience, meaning and behaviours that requires more careful consideration of their influence on timely, appropriate treatment seeking for children. Findings presented in this report suggest that even when effective home treatment as a strategy for malaria control becomes widely available to the majority of the population, with community activities that impart skills and ability to use it, delay to initiate treatment may nevertheless affect prompt, appropriate and effective treatment. This is because delay in getting a child into treatment does not depend only on drug availability or money to buy them but also socio-cultural factors that influence a decision to seek treatment, is a “selective process” (Zola 1966). This selectiveness is influenced by sociocultural variables emanating from experience, meaning and behaviour associated with perceived malaria-related illness in children. Our study communities have health posts centrally located, but the majority of the people did not go there for timely appropriate treatment, and this could not be blamed solely on poverty or inability to pay for drugs and services, or traditional beliefs about care, as other studies also suggest (De Savigny *et al*. 2004).

Our finding that the Abuja target is largely unmet compares with reports from other parts of sub-Saharan Africa, for instance, Nsungwa-Sabiiti *et al*. (2004) reported from Uganda that although, home-based management improves access, antimalarials are likely to be used for only those fevers where ‘western’ treatment is perceived appropriate implying continued delayed and under-treatment of potential malaria. Amin *et al*. (2003) reported from Kenya that only 2.3% of fevers were treated within 24 hours of onset with the nationally recommended first-line drug (SP) for the management of uncomplicated malaria and Holtz *et al*. (2003)

reported from Malawi that 37.4% of recently febrile children received prompt, appropriate treatment. Marsh *et al*. (2004) reported from Kenya that (where drug retailers were trained to help administer treatment) 28% of fever cases received prompts treatment within 24 hours.

However, in Burkina Faso, 56% of fever cases received treatment promptly after training women opinion leaders in the use of pre-packaged antimalarials, chiefly chloroquine, and an antipyretic (Sirima *et al*. 2003). The question remains whether similar levels can be achieved in public health delivery programmes outside of study settings? To improve access to and use of prompt, appropriate treatment requires more careful attention to local experiences, meanings and behaviours for sustainable public health actions.

It was encouraging to find that mosquitoes were reported as a leading perceived cause (91% of all respondents), contrary to what earlier reports showed in other communities in southern Ghana (Ahorlu, *et al*. 1997; Agyepong 1992). Local endorsement of this cause may encourage acceptance of personal protective measures, such as insecticide treated nets in Ghana, where bednet usage has been very low, and used mainly to prevent nuisance mosquitoes (Adongo et al. 2005; Binka & Adongo 1997; Ahorlu *et al*. 1997). Knowledge that mosquitoes cause the illness, however, did not necessarily translate into timely, appropriate treatment seeking, since only 11% of 91 children whose caretakers reported mosquitoes as a cause actually received such treatment within 24 hours.

These findings show that health promotional and educational efforts should not focus too narrowly on correcting wrong perceptions, ideas and practices in the local population. More direct attention is required to encourage caretakers to get children into timely treatment no matter what they perceive to be the cause of PFMI. Whether explained locally as caused by *mosquitoes*, *heat from the sun* or *phlegm* or *playing on the ground*, or something else, the message should focus on the potential of PFMI to progress into a life-threatening condition regardless of the cause. Our interest in PFMI experience, meaning and behaviour is not so much to change incorrect ideas, but rather to promote behaviours that contribute to children's health.

Our findings also show that although poverty and its related consequences are important barriers to timely, appropriate treatment, they are not the only barriers. Furthermore, the

impact of cultural factors on timely appropriate health seeking cannot be dismissed as solely a result of ignorance. Patterns of distress and perceived causes were related to timely, appropriate help-seeking but not as expected. Effects on health-seeking of illness-related experience, and meaning are complex, and explaining their role may strengthen interventions for childhood malaria. Our findings show that perceived risk and vulnerability related to observed danger signs and symptoms determine treatment seeking much more than cognitive features of perception, terminology and classification or economic, geographical and access barriers and this depart from what was reported from Malawi where Nsungwa-Sabiiti *et al*. (2004) showed that fever classifications determined the type of treatment sought for childhood fevers.

Findings are generally applicable to the Twi and Ewe speaking populations of southern Ghana. However, beyond the various local names and terms used to describe febrile conditions and the emphasis on timely treatment covered in this report, findings are similar to what was reported in other studies from southern Ghana (Agyepong 1992; Ahorlu 19997). Findings reported here addressed some operational needs of the current malaria control programme at the local level and therefore should be interpreted with caution beyond the study localities, especially outside the ethnic groups studied.

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Ethical Review

This study was approved by the institutional review boards of Noguchi Memorial Institute for Medical Research and the Swiss Tropical Institute. It was also reviewed by WHO/TDR ethical review committee.

Chapter 5: Saying And Doing: Comparing Vignette-Based Accounts With Case-Based Experience Of Childhood Malaria-Related Illness In Southern Ghana

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5.1 Abstract

Valid and reliable measures of sociocultural factors influencing health behaviour in communities are critical components of evidence-based public health policy, clinical practice and control programmes. Despite the often raised issue of reliability of self-reported measures of health and health behaviours, such data continue to inform health policy and control programmes. This was a cultural epidemiological study and adapted two EMIC interview tools (a case-based and a vignette-based) to study similarities and differences between sayings, and doing it with reference to MRI experiences, meanings and behaviours relevant for control. Mosquito bite and heat from the sun were the most frequently reported most important causes of childhood MRI by both groups. Hot body, diarrhoea and easily startled were the three most frequently reported most troubling symptoms by case-based respondents, while yellowish eyes, refusal of food and weakness were reported by vignette-based respondents. Most frequently reported self-help at home in both accounts was to purchase drugs from drug shops and other local vendors. Government hospital and community clinics were the two most frequently reported outside help options for childhood MRI in both accounts. Case-based respondents (87.0%) reported more frequently that MRI was sometimes fatal compared to 71.0% by vignette-based respondents (p-0.01), on the contrary more vignette-based respondents (27.0%) said MRI was usually fatal compared to 10.0% by the case-based respondents (p-0.01). Only 11.0% and 33.0% of the case-based respondents have their children treated appropriately within 24 and 48 hours, and similar frequencies (9.0% and 34.0%) of vignette-based respondents recommended treatment within 24 and 48 hours respectively.

5.2 Introduction

Malaria is a threat to more than 40% of the world's population and inflicts more than 300 million acute cases with between 1.2 and 2.7 million deaths each year (WHO, 2000; Breman, 2001; WHO, 2002; WHO, 2003; WHO, 2004). Sub-Saharan Africa contributes about 90% of the over all global malaria mortality. Malaria constitutes more than 10% of African's disease burden, and accounts for about 25% of all childhood mortality (WHO 2000, 2003; Marsh *et al*., 1999; Korenromp *et al*., 2003). In Ghana, like most sub-Saharan Africa countries, malaria is the most common cause of death in children under 5 years-of-age (MOH, 1999).

Malaria is a treatable illness but it continues to cause unacceptably very high morbidity and mortality, despite the existence of methods and tools that could effectively reduce these to an acceptable level (Muela, 2000; WHO, 2003; WHO, 2004). The continuing gap between knowledge and timely treatment plus the high rate of morbidity and mortality suggests inconsistencies between local malaria-related illness experiences, meanings and behaviours, and the professional emphasis on mosquito-parasite-human causal relationships. The two paradigms could be harmonised by gathering data that mimics real-life experiences and actions to appropriately inform policy, programmes and clinical practice for malaria.

Various studies have shown that antimalarials delivered at home under study conditions could minimise the incidence of severe episodes and thereby reduce mortality (Pagnoni *et al*., 1997; Kidane & Morrow 2000; Dunyo *et al*., 2001; Sirima *et al*., 2003; Marsh, 2004). Although we promote this strategy, the availability of antimalarials in or close to the home in itself may not lead to early and prompt treatment initiation by caretakers (Hill *et al*., 2003; Nsungwaa-Sabiiti *et al*., 2004). There is also the need to ensure that what is being treated as malaria at home will be as close as possible to what we expect local people, especially caretakers of children under five, to treat as malaria-related illness (Hill *et al*., 2003; Nsungwaa-Sabiiti *et al*., 2004).

This call for innovative ways to collect data to compare the distributions of what people say prospectively and what is done in real-life situation in the population. In this way, interventions will be representative, taking into account what ought to be done (ideal situations) and what is done in reality (actual experience). As reported by De Savigny *et al*., (2004), reported preferences for treatment options for malaria-related illness were different from what caregivers actually did when faced with suspected childhood malaria episodes. A similar view

was presented by Helman (2000): “examining one form of data, such as using a questionnaire to collect statements about stated health beliefs and practices (level one data) may often give a very different picture from what is actually done and observed in the daily lives of the people studied (level two data)”. The question then, is how much can we rely on reported survey data for control programmes? To it, we designed this study to compare actual MRI reports of caretakers and vignette-based MRI responses to assess their similarities and differences, and to determine the distributions of these sociocultural factors in the local population to assess their relevance for control. We therefore, hypothesised that there is no difference between cultural epidemiological categories and variables reported in vignette-based or the actual case-based accounts in our study populations.

5.3 Study Area And Methods

5.3.1 Study Area

The study was conducted from October, 2002 to April 2004 in two malaria-endemic villages (Galo-Sota in the Keta District and Obosomase in the Akuapim North District) of Ghana. Keta District is located in the coastal savannah vegetation zone in the Volta region, where about a third of the total surface area is covered with lakes and ponds. The district has a population of 137,751 (Government of Ghana national population census, 2000). Mainly the Anlo-ewe speaking patrilineal descent group of people (98.8%) inhabit the district (Keta District Annual Report, 2001). The Anlo people are predominantly subsistence food crop farmers but also cultivate shallot (a tropical spice grown in commercial quantity). There are also fishermen and petty traders.

Galo-Sota and its environs is a rural village with a population of about 6,000 to 7,000. There is a health post in the centre of the village, which is staffed by a nurse/midwife, two community health nurses and two auxiliary workers. Malaria is the most common health problem treated at the community health post in 2002 (personal communication). A tributary of the Volta River passes through the village and divides the village into two, Galo and Sota, which collectively constitute Galo-Sota.

The Akuapim North District in the eastern region of Ghana is situated in the forest zone. The district population is 113,915, according to the last census (National population census, 2000). The Akuapim-Twi speaking people predominate in the district. The Akuapim people

are part of the Akan matrilineal descent group of Ghana. The Akuapim people are predominantly food crop farmers and petty traders. Oil palm, a cash crop, is cultivated on a limited scale. The district is currently being prepared as a site for a malaria vaccine trial. Among health science activities in the area is a Centre for Scientific Research into Plant Medicine (Akuapim North District Annual Report, 2001).

Obosomase (population 7,000 to 8,000) is the rural study village in the Akuapim North District. There is a community clinic staffed by a nurse/midwife, a community health nurse and one auxiliary staff, in the village. As in Galo-Sota, malaria is the most common health problem treated at the community clinic in 2002 (personal communication).

5.3.2 Study Methods

We developed two locally suitable EMIC interview instruments for the study. EMIC interviews are instruments used for assessing representations of illness or specified health problems from the perspective of affected persons, their family or community members. The instrument blends qualitative and quantitative approaches into the design and data recording process (Weiss 2001, 1997). The design of this semi-structured interview was informed by baseline ethnographic data which generated locally relevant malaria-related illness categories and representations of experience, meaning and behaviour. One of the EMIC instruments developed was a vignette-based and the other was based on current MRI experience of respondents. Vignette technique is a method that elicits perceptions, opinions, beliefs, attitudes and experiences from responses or comments to stories depicting scenarios and situations (Barter and Renold 1999). (See appendix for sample vignettes).

Field data were collected from October 2002 to April 2004 in two communities. We conducted 200 interviews (100 vignette-based and 100 with caretakers of children ≤5 years suspected of having malaria-related illness). Respondents (≥ 20 years) were selected randomly from communities' registers to participate in the vignette-based interviews. Few of those originally selected refused to participate - one man and one woman at Obosomase and two men at Galo-Sota. Dissenting individuals were randomly replaced from the same community registers. Respondents for the case-based study were purposively selected based on either respondent's own identification of the illness as malaria-related or a clinic or hospital diagnosis. Two inclusion criteria were used: (1) a child in the participant's care has been ill (symptomatic) for at least 3 days, (2) a child in the participant's care has recovered or free from symptoms (asymptomatic) of suspected malaria-related illness within the last 7 days

prior to the day of interview.

A few children encountered in the community during fieldwork with suspected malaria-related illness for less than 3 days were referred to the clinic for free treatments but were not included in the study. None of the caretakers contacted dissented. Interviews were conducted by the first author in the local languages, and data were recorded by a research assistant who has a degree in sociology and was trained to record both qualitative and quantitative data during interviews. The EMIC instruments were pre-tested to refine it and gain experience. The pretesting showed it was unnecessary to tape record the interviews as the data were recorded well by the research assistant.

5.3.3 Data Analysis

Data from both communities were pooled together for this analysis. Qualitative narrative data were entered into Microsoft word for Windows and imported into MAXqda for textual analysis with reference to particular aspects of illness-related experience, meaning and behaviour covered in the interviews. Variables of interest in the quantitative data-base were imported into MAXqda as selection variables. This enabled us to perform a phenomenological analysis of relevant coded segments from selected respondents to complement and clarify the meaning of categories that were analysed with quantitative methods.

Quantitative data were entered in EpiInfo 6.04 and subsequently analysed with the windows version 3.3. We summarized the frequency of spontaneous and probed accounts of cultural epidemiological categories of PD, PC, SH, HS, and CP. The prominence of these cultural epidemiology variables were analysed using Wilcoxon test. Prominence values reflected how the variables were reported, thus, a spontaneous report was assigned the value of 2, probed report was given the value of 1, and not reported was given the value of 0. The total frequencies reported (spontaneously + probed), and the proportions reported spontaneously were presented in appropriate tables together with most important causes and the most troubling symptoms reported These variables were grouped according to the researchers view on their relatedness.

5.4 Results

Table 10. Demographic characteristics of respondents.

Demographic characteristics of respondents	Techniques	
	Actual case-based	Vignette-based
Number of respondents	100	100
Age of respondents*		
Mean age (years)	29.4	37.8
Standard deviation	7.9	12.5
Median age	27	35
Minimum age	16	20
Maximum age	52	73
Female: male ratio	49:1	1:1
Education		
Mean age (years)	5.4	6.6
Standard deviation	4.0	4.2
Median (years)	6.0	8
Minimum years	0	0
Maximum years	13	14
No education (%)	23	19
Marital status (%)		
Married	79	58
Never married	8	20
Divorced/separated	9	16
Widowed	4	6
Household income (%)		
Regular & dependable	16	23
Possibly regular	44	41
Uncertain/not sure	14	7

*Significant difference ($P < 0.05$, t test)

Socio-demographic characteristics of respondents are summarised in Table 12. Participants in the vignette-based interview were older than case-based respondents ($P < 0.05$).

Respondents in the vignette group had more education than those in the case-based group ($P < 0.05$), and this could be because case-based respondents were purposively selected while the vignette-based respondents were randomly selected from the general population, and had more men than in the case-based. Men in both communities have relatively more education than women.

Table 11. Symptoms identified and most troubling symptoms for malaria-related illness.

Pattern of distress reported[1]	How reported[2]					Most important		
	Actual case-based (n=100)		Vignette-based (n=100)			Actual case-based (n=100)	Vignette-based (n=100)	
	Total (%)	Fraction spont.	Total (%)	Fraction spont.				
Fever related symptoms	98.0	0.95	99.0	0.78	**	26.0	34.0	
Hot body	96.0	0.91	x	x		22.0	11.0	**
Yellowish eyes	66.0	0.70	97.0	0.78	**	3.0	18.0	**
Yellowish urine	62.0	0.66	x	x		1.0	4.0	
Chills & rigors	16.0	0.63	x	x		0.0	1.0	
Sweating	32.0	0.25	55.0	0.05	**	0.0	0.0	
Non specific symptoms	99.0	0.97	99.0	0.65	**	66.0	60.0	
Diarrhoea	30.0	0.57	33.0	0.06		18.0	0.0	**
Easily startled/frightened	35.0	0.43	59.0	0.03	**	14.0	3.0	**
Weakness	51.0	0.71	86.0	0.51	**	11.0	15.0	
Lose of appetite/refusal of food	72.0	0.79	x	x		7.0	16.0	**
Vomiting	20.0	0.85	x	x		6.0	7.0	
Weight loss	52.0	0.39	63.0	0.25		4.0	12.0	**
Breathlessness	15.0	0.20	29.0	0.07	**	3.0	1.0	
Crying	44.0	0.73	x	x		2.0	0.0	
Paleness/shortage of blood	32.0	0.34	74.0	0.23	**	1.0	4.0	
Headache	10.0	0.80	18.0	0.67		0.0	1.0	
Sleepiness	12.0	0.58	12.0	0.25		0.0	1.0	
Bitterness in mouth	3.0	0.00	33.0	0.61	**	0.0	0.0	
Joint/bodily pains	15.0	0.20	36.0	0.22	**	0.0	0.0	

[1] Symptoms analysed as groups (in bold) based on reported categories.

*>0.05 p ≤0.10 and ** p≤0.05. Wilcoxon test for comparison of prominence of reported categories (2 = spontaneous, 1 = probed response, 0 = not reported), and fisher's exact test for most troubling categories of symptoms.

[2]Column indicates frequency of reported categories and the fraction of these reported spontaneously.

Reported patterns of distress are presented in Table 12. Categories presented in the vignette were not available for quantitative analysis and were denoted in the table by 'x'. *Hot body* and *refusal of food* were the two most frequently reported symptoms by case-based respondents. These two categories were not available for assessment in the vignette-based accounts quantitatively; however, the following representative narrative revealed their importance. A woman explained: "*The body becomes hot and this makes them cry a lot. They complained of headache and may shiver too. They find it difficult to eat. Their eyes become yellow and they look pale and weak*." A man stated: "*The first thing that I would see to identify fever/asra is the heat from the child's body. Some (fevers) also manifest on the eyes of the child and he may also lose appetite for food and may vomit after every little food intake*." Most of the symptoms assessed quantitatively were reported significantly more by vignette-based respondents than case-based respondents (table 13).

Different symptoms were reported as *most troubling* by the two groups of respondents. The most frequently reported *most troubling* symptoms by case-based respondents were: *hot body, diarrhoea*, *easily startled* and, *weakness*, while vignette-based respondents frequently reported *yellowish eyes*, *refusal of food*, *weakness* and *weight loss* as the most troubling symptoms (table 13).

Table 12. Perceived causes, and the single most important cause for malaria-related illness.

Categories of perceived causes[1]	How reported[2]					Most important		
	Actual case-based (n=100)		Vignette-based (n=100)			Actual case-based (n=100)	Vignette-based (n-100)	
	Total (%)	Fraction spont.	Total (%)	Fraction spont.				
Insect bites								
Mosquitoes bite	91.0	0.76	94.0	0.48	**	46.0	35.0	
Exposure	75.0	0.72	89.0	0.54		20.0	33	**
Heat from the sun or fire	73.0	0.74	81.0	0.68		18.0	31.0	**
Airborne/exposure	12.0	0.92	22.0	0.14		2.0	2.0	
Food & drink	73.0	0.41	96.0	0.27		5.0	18.0	**
Eating fatty/oily food	63.0	0.27	84.0	0.12	*	5.0	8.0	
Unripe/premature fruits	34.0	0.15	72.0	0.08	**	0.0	6.0	**
Eating unbalanced diet	8.0	0.25	18.0	0.17	**	0.0	3.0	*

Impure water	16.0	0.75	31.0	0.39	**	0.0	1.0	
Sanitation & hygiene	86.0	0.50	90.0	0.51		10.0	11.0	
Playing on the ground	27.0	0.67	43.0	0.37	*	4.0	0.0	**
Houseflies	71.0	0.27	78.0	0.13		3.0	3.0	
Personal hygiene/not keeping clean	30.0	0.60	51.0	0.65	**	2.0	4.0	
Sanitation/dirty environment	28.0	0.50	30.0	0.73		1.0	4.0	
Supernatural	42.0	0.05	70.0	0.01	**	1.0	1.0	
Spirits (Witches, gods and ancestral)	37.0	0.05	63.0	0.02	**	1.0	1.0	
Evil eyes or sorcery/charm	24.0	0.04	41.0	0.0	**	0.0	0.0	
Infections	66.0	0.17	73.0	0.07		4.0	1.0	
Worm infections	64.0	0.14	68.0	0.06		4.0	1.0	
Phlegm	17.0	0.18	24.0	0.04		0.0	0.0	
Hereditary & physical exertion	59.0	0.27	66.0	0.12		2.0	1.0	
Hereditary	46.0	0.11	57.0	0.02		2.0	0.0	
Physical exertion/hard work\play	26.0	0.85	33.0	0.88		0.0	1.0	

[1] Perceived causes analysed as groups (in bold) based on reported categories.

*>0.05 p ≤0.10 and ** p≤0.05. Wilcoxon test for comparison of prominence of reported categories (2 = spontaneous, 1 = probed response, 0 = not reported), and fisher's exact test for most important perceived causes.

[2]Column indicates frequency of reported categories and the fraction of these reported spontaneously.

The most frequently reported cause of MRI by respondents in both groups was *mosquito bite*. This was reported in similar frequencies, but with different emphasis. Case-based respondents reported it more spontaneously while vignette-based respondents mentioned it more frequently after probing. Other causes that were frequently reported by respondents in both groups were heat from the sun or fire, houseflies, eating too much of fatty or oily food and worm infections. The two *most important* perceived causes frequently reported were *mosquito bite*, and *heat from the sun or fire* (Table 14).

Similar narrative accounts were given by respondents in the two groups as presented bellow; a respondent in the case-based group explained: "*It is caused by taking unwholesome foods, infested foods like foods exposed to houseflies, eating of foods left uncovered, etc. Mosquitoes can also cause malaria or fever. Children can also get fever as a result of witchcraft actions. It is also possible for the hot sun to give fever if children are exposed too much to it*." Similarly, a respondent in the vignette-based group narrated: "*Mosquitoes can be a cause of asra (malaria/fever). Staying in the hot sun for long can also cause asra and it can also be caused by spiritual forces especially evil spirits. At times when houseflies perch on children's foods they contaminate the food with germs that can also give fever*."

Table 13. Self help at home for childhood malaria-related illness.

Categories of self help at home	How reported[2]				
	Actual case-based (n=100)		Vignette-based (N=100)		
	Total (%)	Fraction spont.	Total (%)	Fraction spont.	
Herbal and other local actions	72.0	0.81	99.0	0.71	**
Showering/bathing with water (tepid sponging)	55.0	0.60	70.0	0.34	
Home-prepared herbal medications for enema	21.0	0.91	44.0	0.45	**
Home-prepared herbal medications for drinking	14.0	0.86	83.0	0.60	**
Home-prepared herbal medications for bathing	0.0	0.00	33.0	0.30	**
Modern pharmaceuticals	84.0	0.96	92.0	0.55	**
Drug/chemical shops to purchase drugs	68.0	0.97	89.0	0.57	
Leftover chloroquine & other antimalarials at home	11.0	0.91	7.0	0.86	
Leftover drugs other than chloroquine at home	9.0	1.00	9.0	0.33	

[1] Self-help actions analysed as groups (in bold) based on reported categories.

*>0.05 p ≤0.10 and ** p≤0.05. Wilcoxon test for comparison of prominence of reported categories (2 = spontaneous, 1 = probed response, 0 = not reported).
[2]Column indicates frequency of reported categories and the fraction of these reported spontaneously.

Reported categories of self-help at home (home management) are shown in table 15. *Buying drugs from the chemical/drug shop* was the most frequently cited self-help action at home reported by respondents in both groups. *Herbal medications* were frequently recommended significantly more by respondents in the vignette-based group than was actually used by the case-based respondents (table 15).

The two most frequently sources of outside help reported by respondents in both groups were government/community clinic and government hospital. Although similar categories of outside help were reported, they were more frequently reported by vignette-based respondents than was actually utilised by case-based respondents (table 16).

Table 14. Help-seeking from outside the home for childhood malaria-related illness.

Categories outside treatment[1]	How reported[2]				
	Actual case-based (n=100)		Vignette-based (N=100)		
	Total (%)	Fraction spont.	Total (%)	Fraction spont.	
Clinic & hospital	73.0	0.96	100.0	0.97	**
Government/community clinic	61.0	1.00	99.0	0.97	**
Government hospital	28.0	0.89	98.0	1.00	**
Other sources of drug	12.0	0.50	19.0	0.21	
drug/chemical shops for advice	11.0	0.55	8.0	0.25	
Health worker in the community for advice	6.0	0.00	16.0	0.13	*
Local healers & religious leaders	11.0	0.55	66.0	0.26	**
Local healers	2.0	0.00	57.0	0.26	**
Religious leaders (Priest/pastor/Imam etc)	10.0	0.60	35.0	0.06	**

[1] Outside help-seeking analysed as groups (in bold) based on reported categories.

*>0.05 p ≤0.10 and ** p≤0.05. Wilcoxon test for comparison of prominence of reported categories (2 = spontaneous, 1 = probed response, 0 = not reported).
[2]Column indicates frequency of reported categories and the fraction of these reported spontaneously.

Childhood MRI has some depressing effect on the family. The reported effects (total, fraction reported spontaneously) were *financial/income related problems* (97.0%, 0.69 and 100.0%, 0.46) for case-based and vignette-based, c*oncern about the course of illness* (99.0%, 0.96 and 99.0%, 0.91) for case-based and vignette-based and *sadness/anxiety or worried* (98.0%, 0.93 and 100.0%, 0.93) for case-based and vignette-based respectively.

MRI was considered a serious childhood problem by respondents in both groups. Majority of respondents in both groups reported that it could be *fatal* s*ometimes*, but more significantly so by case-based respondents (87.0%) compared to vignette-based (71.0%) p=0.01, on the contrary more vignette-based respondents (27.0%) said MRI was *usually fatal* compared to 10.0% by the case-based respondents (p-0.01). The following representative narrative accounts highlight these two positions; a vignette-based respondent said: "*This is a very serious problem so long as the child is still very small (young). The child may die if not treated well early*." Another vignette-based respondent lamented: "*If this condition is not detected early and treated well it can easily kill the child*." From the case-based accounts, a respondent explained: "*I think this problem can kill my child because it had killed some children that I know*." Another case-based respondent entreated: "*It is a very serious illness and if not well treated can destroy the child's life*."

Table 15. Preventive measures reported for malaria-related illness

Categories of control and preventive measures[1]	How reported[2]			
	Actual case-based (N=100)		Vignette-based (N=100)	
	Total (%)	Fraction spont.	Total (%)	Fraction spont.
Insect bites				
Prevent mosquito bite[3]	94.0	0.49	94.0	0.31
Medications (herbal & biomedicine)	92.0	0.51	87.0	0.43
Taking medicines regularly (herbal or	86.0	0.52	73.0	0.43 **

biomedicine)					
Deworming regularly	54.0	0.13	49.0	0.16	
Sun & strenuous play	85.0	0.33	80.0	0.21	*
Stay less in/near heat (sun or fire)	83.0	0.34	79.0	0.28	
Reduction in strenuous/hard work	34.0	0.32	35.0	0.20	
Sanitation & hygiene	66.0	0.50	71.0	0.62	*
Keeping personal hygiene	60.0	0.52	66.0	0.67	
Cleaning the environment	52.0	0.62	49.0	0.74	
Food & drink	81.0	0.38	85.0	0.36	
Avoid fatty/oily foods	64.0	0.27	63.0	0.14	
Drinking clean water	26.0	0.46	32.0	0.41	
Eating balanced diet	38.0	0.50	40.0	0.63	
Eating less starchy food	17.0	0.41	28.0	0.11	
Supernatural	25.0	0.04	37.0	0.00	
Avoid offending evil spirits like the witches	12.0	0.00	15.0	0.00	
Attend to ancestral spirits and family gods	24.0	0.04	32.0	0.00	
Don't know/cannot tell	19.0	1.00	14.0	1.00	

.[1] Preventive measures analysed as groups (in bold) based on reported categories.
*>0.05 p ≤0.10 and ** p≤0.05. Wilcoxon test for comparison of prominence of reported categories (2 = spontaneous, 1 = probed response, 0 = not reported).

[2]Column indicates frequency of reported categories and the fraction of these reported spontaneously.

[3]This includes the use of bednets, coils, sprays, burning of various local herbs etc)

Only 11.0% of children suspected of having MRI received timely, appropriate treatment within 24 hours, and this compared favourably with what was recommended by vignette-based respondents (9.0%). Similarly only 33.0% of the children (cases) received appropriate treatment within 48 hours, and again it compares well with the 34.0% recommended by vignette-based respondents.

The three most frequently reported local preventive measures reported were *preventing mosquito bite* (sleeping under bednet, spraying rooms with insecticide, burning mosquito coils, herbs and other local materials etc), *taking medicine regularly (herbal and/or biomedicine), and staying less in the sun* (table 17*).*

5.5 Discussion

Valid, reliable, and comparable measures of health are critical components of evidence-based public health policy and clinical practice, control programme design, implementation and evaluation. Our finding demonstrates that similar cultural epidemiological variables of PD, PC, SH, HS and CP were reported in both vignette-based and actual case-based accounts, although some of these categories were reported significantly more by vignette-based respondents than case-based respondents, it shows that these categories are well distributed in the studied populations.

Different PD categories were reported as *most troubling* but this should, however, be looked at contextually because case-based respondents were referring to a particular personal experience based on changes observed in their children. They were therefore reporting distresses/symptoms that gave most discomfort and pain to the children as *most troubling*, hence the diversity of *most troubling* symptoms reported even among the case-base respondents.

One can therefore argue that caretakers were constructing realities from what they saw and experienced as causing pain and discomfort to their children who were not well. Vignette-based respondents on the other hand, were relating their cognitive knowledge and ideas to the vignette presented, and therefore have a wider array of patterns of distress to choose from. However, all variables selected as *most troubling* were part of the PD variables reported by both groups of respondents. The important point here for control programmes is the similarity in categories reported but not in the numbers. Despite the differences, more people saying what should be done than was actually done; control programmes could rely on vignette-based accounts to identify relevant local sociocultural variables for intervention. However, as suggested by Barter and Renold (1999), when using vignette techniques, whether in isolation or as part of a multi method approach, the problematic relationship between belief and action should be kept in mind.

Contrary to earlier reports from southern Ghana (Ahorlu *et al*., 1997; Agyepong, 1992), mosquito was reported frequently as a causal agent for malaria-related illness by both vignette-based and case-based respondents. This however, agreed with a recent report from northern Ghana (Adongo *et al*., 2005), and this could be due partly to improved access to information both on radio and television, Ghana has witnessed a rapid expansion of

community radio (Frequency Modulation) stations in the past decade. The importance of this finding is that people did not only report mosquito as a cause of malaria but also frequently identified mosquito bites prevention as a significant preventive measure. This should offer control programme managers and public health specialist an opportunity to reach the people with malaria control measures that rely on mosquito prevention. Here we have in mind the use of insecticide treated nets, which have been found to be very low in Ghana (WHO, 2003), and other locally suitable mosquito bite prevention means.

Another area of causality that should be taken seriously is the perceived link between MRI and the heat from the sun or fire. It has been demonstrated in animal models that infected animals (mice) exposed to UV-B-irradiation have their immune mechanism to eliminate or control the *Plasmodium chabaudi* parasite at the late stage impaired. The naturally resistant experimental mice (B-10) exposed to UV-B for 2 hours and infected with mouse malaria parasite (*P chabaudi*) died between 1 and 2 days after the peak of parasitemia (Yamamoto *et al*., 2000). This should provoke epidemiologists, social scientists, and public health promoters to consider the sun "causal" theory of lay people more seriously. We should be interested in the triggers of clinical episodes of malaria-related illness, especially in semi-immune people because it is the clinical episodes that cause morbidity and mortality.

It could be argued that over the years, people have realised that they are affected by MRI after continuously working in the sun and from these experiences have formulated this locally relevant causal theory that logically explains their misfortunes (malaria attacks). These beliefs should not be discarded as irrelevant to disease control in the local population since it has some relevance for the affected people in the community. The fact that this perceived cause was reported frequently by respondents in both case-based and vignette-based groups means that it does not exist only as folk knowledge or theory, but has become a part of the meaningful explanations of MRI experiences and meanings that may influence illness-related behaviour for suspected childhood malaria. The sun causal model of malaria is common across Africa (Ahorlu *et al*., 1997; Gessler *et al*., 1995; Winch *et al*., 1994, WHO, 2003). This widespread popular belief may hold clues to pathogenicity.

The use of herbal medications, though reported by respondents in both groups, its actual usage as reported by case-based respondents was lower than expected. Whether this was due to the age of the children studied or access to biomedicine in the communities was not clear, and may require further study to explain it. Similarly, categories of outside help-seeking

were recommended more frequently by vignette-based respondents than were actually consulted by case-based respondents. Although statistically different, in reality, it is normal for people to recommend more actions than they would actually do when faced with similar situations. In this case, vignette-based respondents were saying what should be done for the child in the vignette while case-based respondents were reporting their personal experiences in terms of what they have done for the given episodes of childhood MRI that confronted them. This difference was similar to what was reported from Tanzania (De Savigny *et al*., 2004), where more people reported that they would consult traditional healers for malaria with convulsions than actually did in a case follow-up study. Considering the general agreement in both accounts, the statistical differences observed in the ages and educational levels of respondents in our view did not influence the findings. The significant difference observed in perceived seriousness of malaria-related illness could be a coping strategy for most caretakers (case-based respondents) to reduce anxiety over the possibility of their child dying.

Timely, appropriate treatment for childhood malaria is a key feature of global malaria control efforts. However, our finding shows that majority of the children suspected of having malaria did not received treatment within 24 hours as envisaged by the global control programme. Furthermore, only about a third of the children received appropriate treatment within 48 hours, and even more worrying was that similar frequencies were recommended by vignette-based respondents who were just saying rather than doing the desired action. This finding has a serious implication for disease control and requires more serious and concerted effort on the part of local health authorities in collaboration with the communities to improve this situation through targeted simple clear messages emphasising the importance to treat childhood MRI within 24 hours but not on or after 72 hours as reported by respondents.

Findings from the study have largely confirmed our hypothesis that there is no difference between cultural epidemiological variables reported by respondents in vignette-based and actual case-based groups for childhood MRI in our study communities. Although we cannot draw definite parallel between vignette-based and actual case-based accounts based on this study alone, we can say that vignette-based accounts compares favourably with case-based experience in our study, especially considering the fact that MRI often presents non-specific patterns of distress (symptoms). Vignette-based EMIC interview framework should be considered a useful tool for generating rapid data to show the distribution of illness related sociocultural categories in populations for interventions and evaluations

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Chapter 6: Community Concepts Of Malaria-Related Illness With And Without Convulsions In Southern Ghana

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6.1 Abstract

Background: Malaria, both with or without convulsions, is a serious hardship for people living in endemic areas, especially in sub-Saharan Africa. Community references to malaria, however, may encompass other conditions, which was collectively designated malaria-related illness (MRI). Inasmuch as the presence or absence of convulsions reportedly affects timely help-seeking for malaria, a local comparison of these conditions is needed to inform malaria control.

Methods: Vignette-based EMIC interviews (insider-perspective interviews) for MRI with convulsions (convulsion positive, MRI-CP) and without convulsions (convulsion negative, MRI-CN) were developed to study relevant features of MRI-related experience, meaning and behaviour in two rural communities in Ghana. These semi-structured interviews elicited both qualitative narrative and categorical codes for quantitative analysis. Interviews with 201 respondents were conducted.

Results: The conditions depicted in the vignettes were well recognized by respondents and named with various local terms. Both presentations were considered serious, but MRI-CP was more frequently regarded potentially fatal than MRI-CN. More than 90.0% of respondents in both groups acknowledged the need to seek outside help. However, significantly more respondents advised appropriate help-seeking within 24 ($p=0.01$) and 48 ($p=0.01$) hours for MRI-CP. Over 50.0% of respondents responding to questions about MRI-CP identified MRI-CN as a cause of convulsions.

Conclusions: Local comparison of MRI-CP and MRI-CN based on vignettes found a similar profile of reported categories of perceived causes, patterns of distress, help-seeking and preventive measures for both presentations. This differs from previous findings in sub-Saharan Africa, which assert communities regard the two conditions to be unrelated. The perceived relationships should be acknowledged in formulating strategies to control malaria through timely help-seeking and treatment to reduce childhood mortality.

6.2 Background

According to the WHO about 1.3 million people died of malaria in 2003, and about 90% of these deaths occurred in sub-Saharan Africa [1-3]. Convulsions are features of many of these fatal illnesses, and caretakers easily recognise convulsions as a health problem in children. Though biomedical reasons for convulsions with malaria remain unclear, studies have shown important practical differences in local actions for managing childhood malaria-related

illnesses (MRI) with convulsions (i.e. convulsion positive, MRI-CP) and without convulsions (i.e. convulsion negative, MRI-CN) [4, 5]. Many studies argue that convulsions, often considered unrelated to MRI, lead to a significant alteration in the meanings of the illness experience and behaviour, indicating more frequent reliance on traditional healers as the primary source of treatment or in combination with biomedicine [4, 6-12].

Practical questions remain about how this cultural epidemiology of MRI-CP relates to timely, appropriate health-seeking by caretakers. Many studies have reported that MRI-CN is generally treated first at home - either with modern pharmaceuticals (mainly analgesics and inadequate antimalarials), or herbal medications, or both - and caretakers seek outside help only when the illness persists or when they observe a high fever [8, 10, 13-16]. A recent report by de Savigny *et al*. [14], on the other hand, found that for about 80% of malaria-related deaths in Tanzania, modern help was used first. Most control programmes focus on various clinical features of malaria apart from convulsions, and few studies have compared community views of MRI-CP and MRI-CN. Strategies for malaria control assume that appropriate interventions at the febrile stage of the disease will prevent progression to more serious, life- threatening illness.

To explain locally perceived relationships between MRI-CP and MRI-CN, and to consider their practical implications for local management and timely, appropriate help-seeking, The study compares local illness experiences, meaning, and behaviour associated with the two conditions. It aims to clarify their common and distinctive feature, and to consider implications for local management and timely, appropriate help-seeking. Based on the framework for local classification, the study examine the assertion that they are locally perceived to be two distinct conditions, as reported in the literature [6- 9]

6.3 Study Area And Methods

6.3.1 Study Area

This study was conducted from October 2002 to April 2004 in two malaria-endemic villages, Galo-Sota in the Keta District and Obosomase in the Akuapim North District of Ghana. Keta District is located in the coastal savannah vegetation zone of the Volta region, where about a third of the total surface area is covered with lakes and ponds. The district has a population of 137,751 (Government of Ghana national population census, 2000), consisting mainly of the Anlo patrilineal descent group (98.8%). The Anlo language is one of the closely related dialects spoken among the Ewe-speaking people of Ghana (Keta District Annual Report, 2001). The Anlo people are predominantly subsistence food crop farmers, but they also cultivate shallot (a tropical spice grown in commercial quantities). Some are fishermen and petty traders. Galo-Sota is a rural village with a population of about 6,000 to 7,000. A health post is situated at the centre of the village, staffed by a nurse/midwife, two community nurses and two auxiliary workers. Malaria was the most common health problem treated at the community health post in 2002. A tributary of the Volta River passes through the village, demarcating a boundary between Galo and Sota, which together constitute Galo-Sota.

The Akuapim North District in the eastern region of Ghana is situated in the forest zone. The district population is 113,915, according to the last census (National population census, 2000). The Akuapim-Twi-speaking people, members of the Akan matrilineal descent group, predominate in the district. These Akuapim people are mainly food-crop farmers and petty traders. Oil palm, a cash crop, is cultivated on a limited scale. The district is currently being prepared as a designated site for a malaria vaccine trial. Among health science activities in the area is a Centre for Scientific Research into Plant Medicine (Akuapim North District Annual Report, 2001). Obosomase (population 7,000 to 8,000) is the rural study village in the Akuapim North District. It has a community clinic staffed by a nurse/midwife, a community health nurse and one auxiliary staff. As in Galo-Sota, malaria was the most common health problem treated at the community clinic in 2002.

6.3.2 Study Methods

Two EMIC interview tools were developed locally to study the relationship between

sociocultural factors and appropriate treatment-seeking for children up to five years of age. EMIC interviews are locally adapted instruments for assessing representations of illness or specified health problems from the perspective of affected persons, their family or community members. They elaborate the distribution of local insiders' illness-related experience, meaning and behaviour integrating qualitative and quantitative approaches [17, 18]. The designs of these semi-structured vignette-based interviews were informed by baseline ethnographic data which generated illness narratives that specified locally relevant MRI-related categories of distress, perceived causes and help-seeking behaviours. The vignettes for MRI-CP and MRI-CN are included in an appendix "a" and "b". To account for gender differences, two vignettes were presented with men responding to male vignettes and women responding to female vignettes.

Respondents aged 20 years or more were selected randomly from community registers to participate in the interviews. However, younger respondents between the ages of 20 and 25 years of age were unwilling to participate in the interview using the vignette depicting MRI with convulsion, which introduced some age difference between the two groups of respondents. The reason for refusal was, they claimed, that they did not have any experience to talk about. Informal discussions, however, revealed that some people believed that if they talked about convulsions, this may bring that condition to their children. This attitude was observed in both communities. One hundred interviews were conducted using vignettes depicting MRI-CN and 101 using vignettes depicting MRI-CP. Respondents were evenly distributed by sex and community. Few of those originally selected eventually refused to participate in either of the interviews – two men and one woman at Obosomase and three men at Galo-Sota. The dissenting individuals were replaced from the registers.

Interviews were conducted by the first author in the local languages, and data were recorded by a research assistant with a degree in sociology, who was trained to record both qualitative and quantitative interview data. The EMIC instrument was pre-tested to refine it and gain experience. The pretesting showed it was unnecessary to tape record the interviews, inasmuch as the data were recorded very well by the research assistant.

Data from the two communities were pooled for this analysis. Item-specific qualitative narrative data were entered into a word processor (Microsoft Word) and imported in a structured format for automatic coding, referencing text segments of EMIC interview items in

MAXqda, a programme for textual analysis (19). These data were analysed to complement and elaborate the quantitative accounts and to clarify relevant aspects of illness-related experience, meaning and behaviour. Variables of interest in the quantitative data-base were imported into MAXqda as selection variables. This integrated approach to quantitative and qualitative analysis enabled us to perform a phenomenological analysis of relevant coded segments from selected respondents to categories that were analysed with quantitative methods.

Quantitative data were double entered in DOS EpiInfo version 6.04 and subsequently analysed with the EpiInfo Windows version 3.3 (20). The frequencies of spontaneously reported and probed responses were examined to specified categories of cultural epidemiological variables for patterns of distress (PD), perceived causes (PC), self-help at home (SH), outside help-seeking (HS) and preventive measure (PC). The prominence of reported variables (2= spontaneously reported, 1= probed and 0= not reported) was compared in the MRI-CP and MRI-CN groups using the Wilcoxon test. The percentage reporting each category and the fraction reporting the category spontaneously are presented in tables. Respondents were also asked to identify the most troubling symptom (PD) and the most important perceived cause (PC). These variables were compared in the two groups with Fisher's exact test. The variables, as initially coded, were also grouped and analysed under relevant sub-groups, based on investigators' judgement of shared meanings under a broader heading.

Reported duration from illness onset to observe, wait or treat at home before seeking-help from outside the home for the children presented in the two vignettes was analysed to compute anticipated timely, appropriate help-seeking for MRI-CP and MRI-CN within 24 and 48 hours. The reported timeliness was then compared for the two vignette groups.

6.4 Results

The socio-demographic characteristics of respondents are presented in Table 18. Households were headed mainly by men, 75.2% and 67.0% in MRI-CP and MRI-CN groups respectively. Many respondents could not specify their household income, which was about the same in the two groups of respondents.

Table 16. Demographic characteristics of respondents

Demographic characteristics of respondents	Vignettes presented	
	With convulsion (N = 101)	Without convulsion (N = 100)
Age of respondents*		
Mean age	49.0	38.0
Std. Dev.	15.8	12.5
Mode	35	25
Female: male ratio	1:1	1:1
Education		
Mean years of education	6.1	6.6
No education (%)	22.9	19.0
Highest education (years)	20	14.0
Marital status (%)		
Married	66.3	58.0
Never married	3.0	20.0
Divorced/separated	16.8	16.0
Widowed	13.9	6.0
Religion (%)		
Christianity	55.4	64.0
Traditional religion	40.6	35.0
Islamic	3.0	1.0
Others	1.0	0.0
Household income (%)		
Regular & dependable	23.8	23
Uncertain/not sure	52.5	48

Not regular & dependable	23.7	29

* P <.01 (T-test)

The children presented in the two vignettes were the focus of interview questions. Local names or terms used to describe their illnesses, and their approximate English translations or meanings are presented in Table 19. The two conditions presented were identified by different names and terms. All the terms had been identified during ethnographic study as local terms for MRI-CP and MRI-CN.

Table 17. Local terms and their approximate English equivalents

Vignette with convulsions			
Obosomase	English translation	Galo-Sota	English translation
Sroakyereno	Attacked by the sky	Xeivitsoe	Taken/ attacked by a bird
Adiatorniso	Obsessed or possessed	Adukpodzidor dzedzi	Attacked by garbage dump illness
Atridii barima akyereno	Attacked by male malaria	Hehedor dzedzi	Attacked by stretching illness
		Dordzagla/dorsese dzedzi	Attacked by a strong illness
		Dzifotorwotsoe	Taken by the people of the sky
		Miatorwotsoe	Taken by our friends
Vignette without convulsions[1]			
Atridii Ebun Feve Malaria	Hot body, yellowish urine, yellowish eyes, Vomiting, cold, and shivering, bodily pains, weakness, refusal of food, easily startled, paleness, weight loss, etc	Asra Fever Nudza Malaria	Hot body, yellowish urine, yellowish eyes, Vomiting, cold and shivering, bodily pains, weakness, refusal of food, easily startled, paleness, weight loss, etc

[1]Local terms and names for MRI without convulsions have no single equivalent in English, and were used interchangeably to represent similar conditions. “Malaria” and “fever” have also been incorporated in local usage as terms and names.

Respondents in the MRI-CP group appeared somewhat more likely than MRI-CN respondents to consider the condition “usually fatal” (39.6% against 27.0%). Narrative elaborated concerns about mortality: “*This kind of illness kills children easily, especially if parents do not respond quickly to treating the child*.”

“As for this problem, it is a very serious one. If it does not kill the child then it could destroy

the child's ability to reason properly."

For MRI-CN children, mortality was likely to be associated with some vulnerability or neglected treatment: "This is a very serious problem; so long as the child is still very small she may die if not treated properly and early."

"Fever can kill children because people do not consider the disease serious when it is starting, so before they realize it, it has already become worse for the child. What I mean is that it is not a condition that should usually kill, but if it is not seen and treated early, it does kill."

In both situations, a majority of respondents (98.0% for MRI-CP and 96.0% for MRI-CN), said it was necessary that someone stays at home to care for the sick child. The mother of the child was the obvious choice for 97.0% of MRI-CP and for 95.0% of the respondents for vignette depicting MRI-CN.

6.4.1 Patterns Of Distress For Childhood MRI With And Without Convulsions

Reported symptoms of both conditions are presented in Table 20. Some of these were distinctive for each presentation, and others were reported for both presentations, but with some differences. C*onvulsion-related* symptoms were more prominent in the MRI-CP group, and more frequently reported as most troubling. On the other hand, MRI-CN respondents reported significantly more *fever-related* symptom and identified them more frequently as most troubling. *Non specific* symptoms, except for breathlessness, were also most prominent in responses of the MRI-CN group.

The following narratives indicate how people explain the symptoms presented in the vignettes. A woman speaking about convulsive illness characterized typical features: "*In most cases, the child's jaws are locked, and the child becomes very stiff. Also, foaming fluid comes from the mouth. In some cases the child becomes unconscious*."

Another respondent explained, "*Among most typical symptoms, the child begins to shiver and all of a sudden becomes very stiff and hot, and rolls the eye balls*."

A man explained typical symptoms for MRI-CN: "*The first sign is that the child feels very cold*

and then at certain times feels hot. It is also possible that the child loses weight and sweats so much. The child's eyes also turn yellow because of the fever. The colour of his urine will look yellowish, and he may become very weak."

A woman explained, "*The child's body becomes hot and this makes her cry a lot. She may complain of headache, and feels cold and shivers. She may also find it difficult to eat; her eyes become yellow, and she looks pale and weak*."

Table 18. Reported symptoms and single most troubling symptom of MRI with and without convulsions

Categories of distress reported[1]	Reported spontaneously and probed[2]					Most troubling		
	With Convulsion (n=101)		Without convulsion (n=100)			With Convulsion (n=101)	Without convulsion (n=100)	
	Total (%)	Fraction Spont.	Total (%)	Fraction Spont.				
Convulsions related symptoms	98.3	0.72	64.0	0.05	**	67.3	6.0	**
Unconscious	86.2	0.39	18.0	0.06	**	26.7	2.0	**
Stiffness	x	x	0.0	0.00	*	21.8	0.0	*
Easily startled/frightened	76.3	0.32	59.0	0.03	*	7.9	3.0	
Rolling the eye balls	x	x	0.0	0.00	*	5.9	0.0	*
Biting the lips	42.5	0.17	0.0	0.00	**	2.0	0.0	
Foaming mouth	55.4	0.31	0.0	0.00	**	2.0	0.0	
Folded arms	52.5	0.64	0.0	0.00	*	1.0	0.0	
Shaking	x	x	0.0	0.00		0.0	1.0	
Fever related symptoms	37.6	0.55	98.0	0.79	**	9.9	34.0	**
Hot bodies	x	x	x	x		6.9	11.0	
Sweating	14.0	0.14	55.0	0.06	*	1.0	0.0	
Yellowish eyes	28.8	0.65	97.0	0.78	**	1.0	18.0	**
Yellowish urine	x	x	x	x		1.0	4.0	
Chills and Rigors	x	x	x	x		0.0	1.0	
Non specific symptoms	93.1	0.52	99.0	0.66	*	20.8	56.0	*

					*			*
Weakness	72.3	0.52	86.0	0.51	*	11.9	15.0	
					*			
Breathlessness	51.4	0.14	29.0	0.07	*	5.9	1.0	
								*
Refusal of food	x	x	x	x		1.0	16.0	*
					*			*
Weight loss	35.5	0.14	63.0	0.25	*	1.0	12.0	*
					*			
Diarrhoea	0.0	0.00	33.0	0.06	*	1.0	0.0	
								*
Vomiting	x	x	x	x		0.0	7.0	*
					*			*
Paleness	44.5	0.20	74.0	0.23	*	0.0	4.0	*
					*			
Sleepiness	0.0	0.00	12.0	0.25	*	0.0	1.0	
					*			
Bitterness in the mouth	0.0	0.00	33.0	0.61	*	0.0	0.0	
					*			
Joint and bodily pains	16.0	0.25	36.0	0.22	*	0.0	0.0	
Crying	x	x	x	x		0.0	0.0	

[1] Symptoms analysed as groups (in bold) based on reported categories that follow.

*p ≤0.10, ** p≤0.05. Wilcoxon test for comparison of prominence of reported categories (2 = spontaneous, 1 = probed response, 0 = not reported), and Fisher's exact test for most troubling symptoms.

[2]Column values indicate frequency of reported categories and the fraction of these reported spontaneously. Column values marked by "x" indicate categories specified in the vignettes.

Most troubling symptoms reported more frequently by MRI-CP respondents included *unconsciousness* and *stiffness*. For MRI-CN respondents, most troubling symptoms more frequently reported were *yellowish eyes*, *refusal of food*, and *weight loss*. Weakness was identified by some respondents in both groups as most troubling.

Among features of distress, apart from somatic symptoms of malaria, a number of problems were reported to affect the families of the children in the vignettes with and without convulsions (as specified by percent reported/ fraction spontaneous). Nearly all respondents reported loss of income for families of the affected children (99.0% reporting / 0. 42 fraction spontaneous for MRI-CP, and 100% reporting / 0.46 fraction spontaneous for MRI-CN), *concern about the course of illness* (100.0% / 0.90 MRI-CP, and 99.0% / 0.90 MRI-CN) and *sadness, anxiety or worry* (99.0% / 0.94 MRI-CP, and 100% / 0.93 MRI-CN). However, *financial concerns* (unavailability of funds for treatment and inability to work for money), which leads to anxiety, were frequently reported as the most troubling categories of distress for the family, (71.3% for MRI-CP, and 76.0% for MRI-CN). *Concern about the course of illness* was also considered one of the most troubling categories of distress for the family (26.7% for MRI-CP, and 21.0%% for MRI-CN). These were common features of both groups without statistically significant difference between them.

The following representative narratives explain the importance of income loss to the family of a child with MRI. An MRI-CP respondent elaborated: "*Generally, if a child becomes ill, the parents are worried because they do not know what could happen to their child, and in addition to that, it could lead to financial problems for the family*." Another respondent lamented: "*The child's condition can adversely affect her in the future, so the parents would become so bothered and worried about the child, especially if they do not have money. The child could become deaf and mute or have a mental problem. I have seen one like that before*."

Referring to MRI-CN, a man said: "*Fever kills so the family would be worried. Also money issues could be a problem for them*."

Another respondent explained: "*It is very normal that when your child is sick, you become worried, especially if you do not have money*."

6.4.2 Perceived Causes

The prominence of many perceived causes differed for the two groups (Table 21). The most frequently reported perceived causes of convulsions reported by MRI-CP respondents were *spirits*, *phlegm*, worm infections and *atridii/asra/malaria;* this last category refers to local terms for MRI as a cause of convulsions. Most frequently reported perceived causes of MRI by MRI-CN respondents were *mosquito bites*, *eating too much fatty or oily food* and *heat from*

the sun.

Table 19. Reported perceived causes and the single most important cause for MRI with and without convulsions

Perceived causes reported[1]	How reported[2]					Most important		
	With convulsion (n=101)		Without convulsion (n=100)			With convulsion (n=101)	Without convulsion (n=100)	
	Total (%)	Fraction Spont.	Total (%)	Fraction Spont.				
Insect bites								
Mosquito bite	44.4	0.24	94.0	0.48	**	6.9	35.0	**
Infections & malaria-related	95.1	0.64	73.0	0.07	**	43.6	1.0	**
Phlegm	77.1	0.41	24.0	0.04	**	15.8	0.0	**
Atridii/asra/malaria	57.4	0.54	0.0	0.00	**	13.9	0.0	**
Worm infections	58.2	0.17	68.0	0.06		13.9	1.0	**
Exposure	39.6	0.67	89.0	0.63	**	9.9	33.0	**
Heat from the sun or fire	27.8	0.75	81.0	0.68	**	8.9	31.0	**
Airborne/exposure	16.9	0.41	22.0	0.14		1.0	2.0	
Sanitation & hygiene	58.4	0.63	90.0	0.51	**	10.0	11.0	
Personal hygiene	36.8	0.78	51.0	0.65	*	5.0	4.0	
Sanitation	25.9	0.73	30.0	0.73		4.0	4.0	
Playing on the ground	21.9	0.46	43.0	0.37	**	1.0	0.0	
Houseflies	34.7	0.14	78.0	0.13	**	0.0	3.0	*
Supernatural	84.2	0.35	79.0	0.04	**	19.8	1.0	**
Spirits	78.3	0.38	63.0	0.02	**	19.8	1.0	**
Evil eyes or sorcery	50.4	0.24	41.0	0.00	**	0.0	0.0	
Food and drink	36.7	0.38	96.0	0.41	**	2.0	18.0	**
Eating unbalanced diet	0.0	0.00	17.0	0.12	**	2.0	3.0	
Fatty/oily food	26.8	0.15	84.0	0.12	**	0.0	8.0	**
Eating unripe fruits	12.9	0.00	72.0	0.08		0.0	6.0	**
Impure water	11.8	0.83	31.0	0.39	**	0.0	1.0	

[1] Perceived causes analysed as groups (in bold) based on reported categories that follow.

*p ≤0.10 and ** p≤0.05. Wilcoxon test for comparison of prominence of reported categories (2

= spontaneous, 1 = probed response, 0 = not reported), and Fisher's exact test for most important perceived causes.

[2]Column values indicate frequency of reported categories and the fraction of these reported spontaneously.

Overlapping meanings were also reported in respondents' accounts of perceived causes. For example, a woman in the MRI-CP group explained: "*Some people claim that if children play on refuse dumps they easily get convulsion, but I also think that a child can get it through mosquito bites, because these give fever, which can lead to this condition. Worms can also cause a child to get this condition, because worms release some substances into the child's stomach, which in turn gives the child phlegm. And this can cause a convulsion. Evil spirits can also cause children to have this illness*."

A man said: "Malaria is the major cause, but in some cases, spiritual forces can also cause a convulsion. It also depends on the kinds of food that children take, like unbalanced diet."

Explaining MRI-CN, a woman commented: "This condition could have been caused by worm infestations or houseflies that perch on food and contaminate it before it is eaten. Sometimes too mosquito bites can cause it."

Another said: "Maybe she wasn't eating good food. Bad food like fatty/oily foods can lead to this problem. I know that mosquito bites or living in a dirty environment could also cause it. And exposure to the heat from the sun can also cause it."

6.4.3 Self-Help At Home

Respondents reported various self-help options for both conditions. The most prominent among reported sources of self-help for MRI of both types was herbal-based remedies for drinking (Table 22). Among pharmaceutical medicines, purchasing drugs from the drug or chemical shops was most prominent in responses of both groups, but significantly more so for the MRI-CN group. Other traditional remedies, such as scarification were reported more for the MRI-CP vignette.

Table 20. Self-help at home for MRI with and without convulsions

Self help at home reported[1]	How reported[2]	
	Vignette with convulsion (n=101)	Vignette without convulsion (n=100)

	Total	Fraction Spont.	Total	Fraction Spont.	
Herbal & other local actions	96.0	0.92	99.0	0.76	**
Home-prepared herbal medications for drinking	72.3	0.75	83.0	0.60	
Bathing with ordinary cold water (tepid sponging)	67.3	0.34	70.0	0.34	
Home-prepared herbal medications for enema	52.4	0.62	44.0	0.46	*
Home-prepared herbal medications for bathing	40.6	0.73	33.0	0.30	*
Other actions (scarification etc)	22.9	0.96	5.0	1.00	**
Home-prepared herbal medications for other uses	8.0	0.88	8.0	0.50	
Modern pharmaceuticals	52.5	0.34	92.0	0.60	**
Drug/chemical shops to purchase drugs	47.6	0.31	89.0	0.57	**
Other leftover drugs at home	7.7	0.26	9.0	0.33	
Leftover antimalarials at home	1.0	1.00	7.0	0.86	**

[1] Self-help at home analysed as groups (in bold) based on reported categories that follow.
*p ≤0.10 and ** p≤0.05. Wilcoxon test for comparison of prominence of reported categories (2 = spontaneous, 1 = probed response, 0 = not reported).
[2]Column values indicate frequency of reported categories and the fraction of these reported spontaneously.

A woman emphasized the value of various traditional remedies for MRI-CP: “In some cases they say that water kept in a ‘banku pot’ (utensil for preparing a local maize meal) overnight, mixed with urine, can be used to bathe the child for relief. Herbal preparations can also be used to bathe the child. Some people prefer to prepare some herbs for the child to drink. Some also give honey, while some people may buy drugs from the chemical sellers.”

Commenting on MRI-CP vignette, a man indicated how various interventions might all be appropriate: “Some of the possible actions may be to buy drugs from a chemical seller for the child to drink or prepare herbs for drinking or enema.”

A respondent in the MRI-CN vignette group indicated the value of diverse treatment for that

condition as well: “Some medicine could be given at home as a measure to reduce the severity of the illness. The medicine could be bought from the drug stores if there are no leftovers. Some herbal medications can also be given to the child.”
Another said: “The family may decide to buy drugs for the child; they could also decide to prepare herbs for the child to drink.”

6.4.4 Outside Help-Seeking

Table 21. Help-seeking from outside the home for MRI with and without convulsions

Outside help seeking reported[1]	How reported[2]				
	Vignette with convulsion (n=101)		Vignette without convulsion (n=100)		
	Total	Fraction Spont.	Total	Fraction Spont.	
Clinic & hospital	99.0	0.96	100.0	1.00	
Government/community clinic	95.1	0.96	99.0	0.97	
Government hospital	95.0	0.96	98.0	1.00	
Local healers & religious leaders	84.2	0.40	66.0	0.26	**
Local healers	69.4	0.46	57.0	0.26	**
Religious leaders (pastors/Imams)	44.3	0.11	35.0	0.06	
Other source of modern pharmaceuticals	13.8	0.43	19.0	0.21	
Health worker in the community for advice	12.8	0.38	17.0	0.12	
Drug/chemical shops for advice	3.0	0.33	8.0	0.25	

[1] Outside help-seeking analysed as groups (in bold) based on reported categories that follow. *p ≤0.10 and ** p≤0.05. Wilcoxon test for comparison of prominence of reported categories (2 = spontaneous, 1 = probed response, 0 = not reported).
[2]Column values indicate frequency of reported categories and the fraction of these reported spontaneously.

The need to seek help outside the home was reported by nearly everyone for both conditions (Table 23). More MRI-CP respondents however were concerned about getting treatment right away. In the MRI-CP group, 29.0% said outside help should be sought within 24 hours, compared with 9.0% for the MRI-CN group (p <0.01). The same relative priority was

indicated by responses advising treatment within 48 hours (53.0% MRI-CP and 34.0% MRI-CN, p = 0.01).

Similar outside sources of help were identified by respondents in both groups (Table 6). Although more MRI-CP respondents recommended traditional healers, other health care providers were suggested by similar percentages from both groups.

Commenting on outside help-seeking for MRI-CP, a woman explained that home remedies at some point were not enough: “If the herbs used at home do not work, other people who know more herbs, like traditional healers, could be consulted. The child could also be taken to the clinic or hospital, but this costs money.”
Another observed: “As soon as it is clear that what is done at home does not work, the child would have to be sent to a clinic or hospital. The hospital or clinic is the best place, and the family must go, but they can also see a traditional healer for treatment.”

Some MRI-CN respondents like this woman, compared modern and traditional health care providers favourably: “A clinic or a hospital should be the best places to go but some traditional healers also know about herbs that work.”
A man emphasized the importance of not waiting too long before getting help from a doctor: “As soon as the child’s condition does not get better after the home treatment the family should consult a doctor.”

6.4.5 Prevention

Most respondents in both groups (74.3% MRI-CP and 84.0% MRI-CN) said the conditions in the vignettes could have been prevented, there was however a borderline significant difference (p=0.06). Categories of preventive measures suggested for both presentations were similar (Table 24). Preventive measures frequently reported included *preventing mosquito bites*, *staying less in the sun*, *maintaining personal hygiene*, *environmental cleanliness*, *drinking clean water*, *avoiding fatty or oily foods*, and *reducing strenuous or hard work/play*. These were reported more frequently by respondents in MRI-CN group. Preventive measures based on magico-religious ideas were mentioned more frequently in the MRI-CP group. Measures frequently reported by similar percentages in both groups included *taking medications regularly* (herbal or biomedicine) and *deworming children regularly*.

Table 22. Preventive measures for MRI with and without convulsions

Preventive measures reported[1]	How reported[2]				
	Vignette with convulsion (n=101)		Vignette without convulsion (n=100)		
	Total	Fraction Spont.	Total	Fraction Spont.	
Insect bites					
Prevent mosquitoes' bite[3]	58.4	0.27	94.0	0.31	**
Regular medications	88.1	0.24	87.0	0.27	
Taking herbal or biomedicine regularly	75.4	0.45	73.0	0.44	
Deworming regularly	50.4	0.18	49.0	0.16	
Sun & strenuous play	33.6	0.21	80.0	0.29	**
Stay less in the sun or near fire	31.9	0.22	79.0	0.28	**
Reduction in strenuous play	8.0	0.13	35.0	0.20	**
Sanitation & hygiene	55.4	0.66	71.0	0.66	**
Cleaning the environment	29.7	0.63	49.0	0.74	**
Keeping personal hygiene	51.5	0.65	66.0	0.67	**
Food and drink	59.4	0.47	86.0	0.38	**
Eating balanced diet	33.6	0.59	40.0	0.63	
Avoid fatty/oily foods	29.8	0.03	63.0	0.14	**
Drinking clean water	18.8	0.37	32.0	0.41	**
Eating less starchy food	17.8	0.11	28.0	0.11	*
Eating on time (not going hungry for long)	10.9	0.00	16.0	0.13	
Drink a lot of vegetable soup	10.9	0.28	18.0	0.28	
Magico-religious	47.5	0.19	37.0	0.00	**
Avoid offending evil spirits like the witches	23.8	0.25	15.0	0.00	*
Attend to ancestral spirits and family gods	40.7	0.20	32.0	0.00	
Don't know/cannot tell	22.8	1.00	14.0	1.00	

[1] Preventive measures analysed as groups (in bold) based on reported categories that follow. *p ≤0.10 and ** p≤0.05. Wilcoxon test for comparison of prominence of reported categories (2 = spontaneous, 1 = probed response, 0 = not reported).

[2]Column values indicate frequency of reported categories and the fraction of these reported spontaneously.

6.5 Discussion

This study identifies similarities and differences between local concepts, meanings, self help at home, help-seeking from outside the home and recommended preventive measures for MRI with and without convulsions. As reported in many studies across sub-Saharan Africa, spiritual forces dominate perceived causes for MRI-CP, compared to MRI-CN [4, 6, 8, 9, 14, 22-24] However, Findings reported here show that priority of timely, appropriate care is not reduced by local traditional perceived causes of convulsive illness. Although more respondents in the convulsions group reported magico-religious causes than respondents in non-convulsions groups, they also more frequently recommended medical treatment within 24 and 48 hours of illness onset.

Although concerns about supernatural causes of convulsions were evident, even affecting our ability to recruit young adult respondents for the MRI-CP sample, most respondents for the two presentations reported that the children in the vignettes should be taken to the clinic or hospital for treatment. This differs from many reports across sub-Saharan Africa, where studies emphases use of traditional healers as the primary source of treatment for convulsions, rather than modern medical care [6, 7, 8, 9, 21]. Some studies however, have reported the use of both biomedicine and traditional healers [10, 11, 22]. Findings are consistent with those of de Savigny *et al*. [14] in Tanzania, reporting that 78.7% of fatal malaria cases received modern treatment as the first resort for their last illness episode.

The 28.0% of MRI-CP respondents recommending appropriate treatment within 24 hours was significantly more than the 9.0% of MRI-CN respondents who did so ($p < 0.01$), but the rates for both are relatively low, and far below the designated Abuja target. The percentages were higher for 48 hours (53.0% and 34.0%, $p = 0.01$), but still lower than the 60.0% specified in the Abuja target for 24 hours (15). This could mean that the message of the priority of timely treatment has either not yet reached these communities or it is not compelling enough to motivate action and hence needs reinforcement.

It is notable that despite the distinctiveness in many studies of MRI-CP and MRI-CN illnesses,

57.4% of respondents in the MRI-CP group have reported that malaria is a cause of convulsions, and 13.9% said malaria is the most important cause of convulsions. The emerging local awareness of the link between mosquitoes, malaria, and convulsions should be strengthened to reinforce the priority of timely, appropriate treatment for febrile malaria without convulsions. Information, education and communication (IEC) have important roles to play in that regard. More people acknowledge the value of home-based treatment for MRI-CN, consistent with a policy to promote that option for uncomplicated malaria. Reliance on traditional healers, especially for MRI-CP, however, remains a problem, inasmuch as this results in many children not receiving timely antimalarial treatment. The use of a mix of traditional remedies (herbal and rituals) and biomedical treatments are consistent with the literature [5, 10-12, 22].

For both conditions, findings also suggest approaches to prevention that are related to local perceived causes, mostly involving avoidance of identified causes. Most people, similar in both groups, recommended regular medications as a preventive measure, indicating favourable prospects for implementing intermittent preventive treatment (IPT) for pregnant women. The finding suggests it may be feasible to introduce intermittent preventive treatment for children under five years of age to reduce morbidity and mortality in this vulnerable age group. When evaluating such policy options, the risk of drugs being used inappropriately should be weighed against prospects for reducing mortality.

Widespread recommendations to avoid mosquito bites to prevent both conditions indicate good prospects in these communities and others like them for acceptance of insecticide-treated bednets. The idea that uncomplicated malaria may progress to convulsions may further reinforce such an approach to prevention. These issues would need emphasis when developing IEC as an intervention to reduce MRI-related morbidity and mortality in the study communities.

The study shows that despite the complexity of local experience, meaning and behaviour with respect to malaria-related illnesses, it is possible to identify the distribution of categories and explain local illness behaviours, their sociocultural determinants, and practical implications in endemic local rural communities. Relating results to timely help-seeking and malaria prevention suggests ways of incorporating local relevance ideas into the design and implementation of local programme strategies, especially IEC, an indication of how cultural epidemiology may inform malaria control activities to make them sustainable to reduce MRI-

related morbidity and mortality.

Though, this study was carried out in two rural communities in southern Ghana findings may be generally applicable in most part of Ghana, especially the southern half of the country. However, local variations must be considered when interpreting findings for areas outside the study localities.

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6.7 Appendix 1a. Vignette Depicting MRI With Convulsion Positive (MRI-CP)

Introduction to vignette

'I appreciate your agreeing to talk to me about a problem that affects many children in this district. I want to understand how you think about it. Keep in mind that it is your ideas that I am interested in, so please do not feel there is a right or wrong answer to the questions I will ask you. Do not be shy to tell me what you think. So then, let me tell you a story about a child called Kofi/Ama who has this problem.'

MALE	FEMALE
'Kofi is a 2½ year-old boy who had been feeling fine and playing happily. One day last week, Kofi woke up crying, and his mother found that his body felt very hot. Kofi seemed to be feeling cold and he was shivering. This was on and off for some time and he refused to eat anything. His urine was yellow in colour. He has vomited too. A few hours later, he started rolling his eyes. With his eyes opened wide, he was shaking and became stiff'	'Ama is a 2½ year-old girl who had been feeling fine and playing happily. One day last week, Ama woke up crying, and her mother found that her body felt very hot. Ama seemed to be feeling cold and she was shivering. This was on and off for sometime and she refused to eat anything. Her urine was yellow in colour. She vomited too. A few hours later, she started rolling her eyes. With her eyes opened wide, she was shaking and became stiff'

6.8 Appendix 1b. Vignette Depicting MRI With Convulsion Negative (MRI-CN)

Introduction to vignette

'I appreciate your agreeing to talk to me about a problem that affects many people in this district. I want to understand how you think about it. Keep in mind that it is your ideas that I am interested in, so please do not feel there is a right or wrong answer to the questions I will ask you. Do not be shy to tell me what you think. So then, let me tell you a story about a child called Kofi/Ama who has this problem.'

'Kofi is a 2½ year-old boy who had been feeling fine and playing happily. One day last week, Kofi woke up crying, and his mother found that his body felt very hot. Kofi seemed to be feeling cold and he was shivering. This was on and off for sometime. He refused to eat anything. His urine was a yellow colour, and after a few hours, he vomited.'

'Ama is a 2½ year-old girl who had been feeling fine and playing happily. One day last week, Ama woke up crying, and her mother found that her body felt very hot. Ama seemed to be feeling cold and she was shivering. This was on and off for sometime. She refused to eat anything. Her urine was a yellow colour, and after a few hours, she vomited.'

Chapter 7: Malaria-Related Illness In Pregnancy: Experience, Meaning, And Help-Seeking.

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7.1 Abstract

The effects of malaria on pregnant women, their foetuses, and newborns impose a large disease burden. It is not clear, however, how professional priorities relate to local priorities, and how the relationship between malaria and pregnancy is understood in communities. Although, public health communicates professional priorities expecting that local priorities and relationship between malaria and pregnancy are similar to what they communicated. Also the relationship between malaria and pregnancy may differ among pregnant women and non-pregnant general population (men and women). Pregnant women may rely on their experiences and meanings for their health priorities and we had to know how similar or different their ideas about malaria and pregnancy are from non-pregnant general population. We compared vignette-based accounts of pregnant women and non-pregnant general population using cultural epidemiology tool of EMIC interviews. More pregnant women (35.0%) regarded malaria as potentially fatal compared to the general population (23.0%, p=0.04, Fisher's exact test). Yellowish eyes was the single most troubling symptoms reported in both groups, but a significantly more frequently by the general population. Mosquito bites and exposure to heat from the sun were the two most frequent perceived causes identified as most important in both groups. Similar self-help actions were reported, but pregnant women more often reported the use of leftover drugs at home. Majority (97.0%) of respondents in both groups recommended outside help-seeking, and similar sources were mentioned. There was no difference between the two groups concerning the need for timely, appropriate help-seeking within 24 and 48 hours. Findings indicated agreement in perceptions of malaria and the priority of treatment, but also showed how the experience of pregnancy affects perceptions of malaria. Our study indicates potential for acceptance of IPT and potential value in remote areas for community services to deliver IPT combined with antenatal care.

7.2 Introduction

Malaria has important effects on pregnant women, their foetuses, and their newborns imposed an extremely large but often hidden burden, especially in Africa. It is estimated that over 400,000 women develop anaemia during pregnancy annually as a result of malaria in sub-Saharan Africa alone (Murphy & Gaps 2001; Steketee *et al*. 2001; van Geertruyden *et al*. 2004; Shulman & Dorman 2003; Nosten *et al*. 1999; WHO 2000; WHO 2003; Tanner & Vlassoff 1998; Ndyomugyenyi *et al*. 2001).

It is not clear, however, how professional priorities relate to local priorities, and how the relationship between malaria and pregnancy is understood in communities. Although, public health communicates professional priorities expecting that local priorities and relationship between malaria and pregnancy are similar to what they communicated. Also the relationship between malaria and pregnancy may differ among pregnant women and non-pregnant general population (men and women). Pregnant women may rely on their experiences and meanings for their health priorities and we had to know how similar or different their ideas about malaria and pregnancy are from non-pregnant general population. This may lead to a gender sensitive approaches to control malaria in pregnancy in sub-Sahara Africa (Tanner & Vlassoff 1998).

Strategies for pregnant women focus on intermittent preventive treatment (IPT) with antimalarials and the use of insecticide treated nets. Currently in Ghana, Sulfadoxine Pyrimethamine (SP) is the drug of choice for IPT, which is to be given 3 times during pregnancy. The first dose is given after 16 weeks of gestation and the subsequent ones are given at least one month after the previous one. Pregnant women who are allergic to sulphur-based drugs are not given SP, but they are encouraged to sleep under insecticide-treated nets. These services are monitored with direct observation, and provided free of charge (Ghana Health Services 2004).

To ensure the effectiveness of IPT and other interventions for pregnant women, understanding of local malaria-related illness (MRI) experiences, meanings, and behaviours in pregnancy is required, inasmuch as they may affect risk or preventive behaviour relevant for control activities. Questions for control programmes, such as successful implementation of IPT, include whether the clinic-based delivery is accessible to the majority of pregnant women, and what are the sociocultural factors affecting perceived needs and accessibility of the service by pregnant women. Gender-sensitive services require careful attention to such

goals for reducing malaria-related morbidity and mortality in pregnant women, their foetuses and infants (van Geertruyden *et al*. 2004; Shulman & Dorman 2003). The interaction of pregnancy with sociocultural experience, and meanings of malaria that affect preventive and treatment-seeking behaviour requires study.

Our study focuses on malaria-related illness and examines the experience, meaning and behaviour associated with this illness. It compares the views of malaria in pregnancy between pregnant women and non-pregnant women and men in the general population.

7.3 Study Area

The research was conducted from October 2002 to April 2004 in two malaria-endemic villages in Ghana: Galo-Sota in the Keta District and Obosomase in the Akuapim North District. The choice of these two communities was to increase the power of the study, and to have a fair idea of the situation in southern Ghana, but not necessarily to compare the two villages.

Keta District is located in the coastal savannah vegetation zone in the Volta region, where about a third of the total surface area is covered with lakes and ponds. The district has a population of 137,751 (Government of Ghana national population census 2000). The Anlo people (98.8%) are the majority in this district. They are a part of closely related dialects forming the Ewe-speaking tribal group of Ghana (Keta District Annual Report 2001). The Anlo people are patrilineal, and predominantly subsistence food crop farmers, but many also cultivate shallot, a tropical spice grown in commercial quantity. Some are also fishermen and petty traders.

Galo-Sota is a rural village with a population of about 6,000 to 7,000. There is a health post in the centre of the village, which is staffed by a midwife, two community health nurses and two auxiliary workers. The health post provides antenatal and child welfare services on regular basis. Malaria is the most common health problem treated at the community health post in 2003. A tributary of the Volta River passes through the village and divides the village into two, Galo and Sota, which collectively constitute Galo-Sota.

The Akuapim North District in the eastern region of Ghana is situated in the forest zone. The district population is 113,915, according to the last census (National population census 2000).

The Akuapim-Twi speaking people predominate, and are mainly food crop farmers and petty traders. Oil palm, a cash crop, is cultivated on a limited scale. The district is currently being prepared as a site for a malaria vaccine trial. A Centre for Scientific Research into Plant Medicine is located in the district (Akuapim North District Annual Report 2001).

Obosomase (population 7,000 to 8,000) is the rural study village in the Akuapim North District. It has a community clinic staffed by a midwife, a community health nurse and one auxiliary staff. As in Galo-Sota, the clinic provides antenatal and child welfare services on regular basis. Malaria is the most common health problem treated at the community clinic in 2003.

7.4 Study Methods

We developed a locally suitable vignette-based EMIC interview instrument for this study. EMIC interviews are instruments used for assessing representations of illness or specified health problems from the perspective of affected persons, their family or community members. The instrument blends qualitative and quantitative approaches into the design and data recording process focusing on experience or patterns of distress (PD), meaning or perceived causes (PC), and behaviour or help-seeking (HS) associated with malaria in pregnancy (Weiss 2001; 1997). The questions of these semi-structured interviews were informed by baseline ethnographic data, which had identified relevant malaria-related illness categories and representations of experience, meaning and behaviour. The vignette technique is a method that elicits perceptions, opinions, beliefs, attitudes and experiences from responses or comments to stories depicting scenarios and situations (Barter & Renold 1999). The vignette used for these interviews depicted a pregnant woman with typical symptoms of malaria. (See appendix for vignettes).

We conducted 200 interviews (100 with randomly selected respondents from the general population, and 100 with pregnant women). Respondents from the general population (≥ 20 years) were randomly selected from community registers to participate in the study. Few persons originally selected refused to participate (two men, one at Obosomase and another at Galo-Sota). Dissenting individuals were randomly replaced from the same community registers. Pregnant women were purposively selected with identified pregnant women asked to help recruit others. All pregnant women invited to participate consented to take part in the study.

Interviews were conducted by the first author in the local languages, and data were recorded by a research assistant who has a degree in sociology and was trained to record qualitative and quantitative data during interviews. The EMIC interviews instrument was pre-tested to refine it and gain experience. The pretesting showed it was unnecessary to tape record interviews, in as much as data were recorded very well by the research assistant.

7.4.1 Data analysis

Data from the two communities were pooled for this analysis. Qualitative narrative data were entered into a word processor (Microsoft Word) and imported in a format to facilitate automatic coding by interview item (experience, meaning, and behaviour) in MAXqda, a programme for textual analysis. These structured illness narrative data were analysed to clarify aspects of illness-related experience, meaning and behaviour. Variables of interest in the quantitative data-base were imported into MAXqda as selection variables. This enabled us to perform a phenomenological analysis of relevant coded segments from selected respondents to complement and clarify the meaning of categories and associations that were analysed with quantitative methods.

Categorical data for quantitative analysis were entered in EpiInfo 6.04 and subsequently analysed with the windows version 3.3. We analysed the frequencies and prominence of categories. Prominence refers frequency, priority and style of response that is spontaneous and probed. Coded cultural epidemiological variables for categories of distress (PD), perceived causes (PC), self-help at home (SH) and outside help-seeking (HS) were examined. To specify the relative prominence of each category of malaria-related illness experience, meaning and behaviour, spontaneous responses to open-ended questions were assigned a reporting prominence of 2, a reporting prominence of 1 if mentioned only after probing and 0 if not mentioned at all. This prominence was the basis for comparison between the general population and pregnant women study group.

7.5 Results

7.5.1 Demographic Characteristics Of Respondents

Socio-demographic characteristics of respondents are summarised in table 25. Respondents selected from the general population were significantly older than the pregnant women ($p<0.01$). Although most households were headed by men, as expected in a traditional rural

environment, 22% of households were notable headed by women.

Table 23. Demographic characteristics of respondents

Demographic characteristics	General population (n=100)	Pregnant women (n=100)
Age of respondents*		
Mean years	43.4	26.5
Standard deviation	13.9	6.5
Minimum age	20	16
Maximum age	84	45
Female: male ratio	1:1	
Education		
Mean age (years)	5.9	5.9
Standard deviation	4.4	3.3
Median (years)	7.0	7.0
Minimum years	0	0
Maximum years	12	13
No education (%)	27	14
Household income (%)		
Regular & dependable	21	26
Uncertain or not sure	55	45
Not regular & dependable	24	29
Marital status (%)		
Married	74	81
Never married	3	16
Divorced/separated	17	3
Widowed	6	0
Number of pregnancy		
Mean		3.0
Standard deviation		1.8
Median		3.0
Minimum		1.0
Maximum		10.0
Gestation period (months)		
Mean		5.5

Standard deviation	1.2
Minimum	3.0
Maximum	8.0
Antenatal clinic visit (%)[1]	
Attend antenatal ≥1	61.0
No attendance	39.0

*P <.05, T- test.

[1]At the time of interview.

The mean (± Sd.) number of pregnancies was 3.0 (±1.8), and the mean gestation time was 5.5 (±1.2) months. Among pregnant women, 61.0% had visited the antenatal clinic at least once. There was no relationship between the gestation period and clinic attendance, but 2 women in their third month of pregnancy at the time of interview had not yet attended the antenatal clinic.

7.5.2 Recognition

All respondents except 4 (3 pregnant women, and 1 woman from the general population) identified the pregnant woman presented in the vignette as having an MRI (malaria-related illness) that is, a condition identified with a local term for malaria. Two pregnant women referred to the condition as AIDS, and two respondents, one from each group, said the woman in the vignette was suffering from jaundice.

7.5.3 Seriousness of MRI

Malaria in pregnancy was considered very serious by both groups of respondents. However, significantly more pregnant women (35.0% compared to 23.0% by the general population) said that it could be *fatal (p=0.04, Fisher's exact test)*. Narrative accounts elaborated the nature of pregnant women's concern: "*Atridii* (malaria*) is very serious in pregnant women like me. It kills if not treated promptly and appropriately*." Another pregnant woman narrated: "*it (malaria) is more severe among pregnant women than those who are not pregnant, because pregnant women are vulnerable, and every little thing makes them fall sick and feel very tired*." A respondent from the general population focussed on the vulnerability of the foetus: "*It is a very serious condition that can cause her to even lose her baby*." Another focussed on variable effects: "*It is a serious problem in some pregnant women but not in others, and can*

cause a lot of complications, though it does not kill them very often."

7.5.4 Absence From Work Or School

Most respondents in both the pregnant women and the general population groups acknowledged the need for someone to stay away from work or school to take care of the pregnant woman, though more in the general population (94.0%) than in the pregnant women (84.0%, p = 0.02). Some who said no special care was needed identified competing needs for others to work: "*It will not be necessary for someone to stay away from work because, once they take care of her in the morning, they can go to work, but they must come home early. As you know, in this community, if you do not go, you do not eat. They also need to go and look for money for treatment of the pregnant woman."*

Others more commonly emphasised the need for family caretakers to look after the pregnant woman with malaria: "Once the person is sick you can't leave her and go to work or school. It's not normal, so her mother or her grown-up daughter has to stay with her."

7.5.5 Self Help At Home

Similar self-help actions at home were suggested by respondents in both groups (table 26). However, respondents in the general population recommended *home-prepared herbal medicine for drinking* more than pregnant women did. Nearly one in four pregnant women recommended use of *leftover drugs* at home, significantly more than respondents in the general population group. Other self-help categories reported frequently in both groups without significant differences were *purchasing drugs from chemical/drug shops*, *herbal enema* given at home, and *tepid sponging.*

Table 24 Self-help at home for MRI in pregnancy

Categories self-help at home[1]	How reported[2]				
	General population		Pregnant women		
	Total (%)	Fraction spont.	Total (%)	Fraction spont.	
Herbal & other local actions	99.0	0.73	97.0	0.62	*
Home prepared herbal medication for drinking	88.0	0.75	84.0	0.58	**

Home prepared herbal medication for enema	36.0	0.53	43.0	0.30	
Showering/bathing cold water (tepid sponging)	70.0	0.20	73.0	0.19	
Home prepared herbal medication for bathing	29.0	0.41	35.0	0.20	
Home prepared herbal medication for other uses	15.0	0.53	9.0	0.56	
Modern pharmaceuticals	85.0	0.56	87.0	0.53	
Purchase drugs from drug/chemical shops	85.0	0.60	85.0	0.67	
Leftover drugs available at home	6.0	0.33	23.0	0.13	**

1 Self-help at home analysed as groups (in bold) based on reported categories that follow.
*p≤.10, ** p≤.05. Wilcoxon test for comparison of prominence of reported categories (2 = spontaneous, 1 = probed response, 0 = not reported).
[2]Column values indicate frequency of reported categories and the fraction of these reported spontaneously.

Narratives indicated that pregnant women respondents were sensitive to possible adverse effects of some home remedies. A pregnant woman commented: "*Prayer can be said at home as a measure to calm down the condition. Herbs can be cooked for her to drink, especially if there is no money to send her to hospital immediately. But some of these herbs are not good for the unborn child.*" Narratives from the general population respondents indicated less sensitivity to effects on the foetus. For example, they typically referred to various interventions without mentioning the possibility of effects on the foetus: "*There are herbs that can cure fever, so she should be given some to drink. She should also take a shower with cold water. Drugs could be bought from chemical sellers for her to drink, and if all these fail, then they can send her elsewhere outside the home*"

7.5.6 Outside Help-Seeking

Table 25 Help-seeking from outside the home for MRI in pregnancy

	How reported[2]			
	General population		Pregnant women	
Categories of outside help seeking[1]	Total (%)	Fraction spont.	Total (%)	Fraction spont.

Clinic & hospital	100.	0.98	98.0	0.98	
Government community clinic	98.0	0.98	97.0	0.98	
Government hospital	98.0	0.97	93.0	0.96	
Other sources of drug	26.0	0.08	40.0	0.08	**
Drug or chemical shops for advice	10.0	0.90	34.0	0.79	**
Health worker in community for advice	21.0	0.10	28.0	0.11	
Local healers & religious leaders	73.0	0.33	76.0	0.38	
Local healers	55.0	0.31	62.0	0.39	
Religious leaders (Priest/pastors, Imam etc)	38.0	0.21	56.0	0.29	**
Traditional birth attendants (TBA)	5.0	0.40	19.0	0.07	**

1 Outside help-seeking analysed as groups (in bold) based on reported categories that follow. *p≤.10, ** p≤.05. Wilcoxon test for comparison of prominence of reported categories (2 = spontaneous, 1 = probed response, 0 = not reported).

[2]Column values indicate frequency of reported categories and the fraction of these reported spontaneously.

Nearly all respondents in both groups recommended that the pregnant woman in the vignette should seek help from outside the home (table 27). The most frequently recommended sources of outside help in both groups were government hospitals and clinics. Pregnant women, however, recommended several additional sources of outside help more often than the general population: consulting drug shops for advice; consulting religious leaders like pastors, priests, and Imams; and traditional birth attendants.

The following narrative indicates the effectiveness of media messages motivating use of hospitals and the clinics for outside help in both groups. A respondent in the general population explained: *We were told by nurses and on the radio that when treatment at home fails for 3 days, we should send the patient to a clinic or hospital to avoid complications because of the pregnancy*." Pregnant women discussed the value of more options for outside help: "*She (the pregnant woman in vignette) can be sent to so many places for treatment, depending on the financial position of her family. They could take her to a pastor for prayer, clinic, hospital or a local healer*. "

7.5.7 Timely, Appropriate Treatment

Very few respondents in both groups recommended treatment for the pregnant woman in the

vignette within 24 and 48 hours of illness onset respectively. (7.0% of the general population and 5.0% of pregnant women recommended treatment within 24 hours, and 24.0% of general population and 20.0% of pregnant women within 48 hours). Most of the respondents in both groups have recommended outside help-seeking at or after 72 hours from illness onset (76.0% by the general population, and 80.0% by pregnant women). Informal discussions explained that the local calendar of events in our study communities fixes 72 hours as a suitable time frame for taking action in various situations, including help-seeking for ill-health.

7.5.8 Symptoms

Besides the symptoms presented in the vignette, others were reported in both groups' accounts. Common features of MRI in pregnancy frequently reported were *diarrhoea*, *yellowish eyes*, *loss of appetite*, *paleness or shortage of blood* and *weight loss* (table 28). However, *breathlessness*, *being easily startled*, *weakness*, and *sweating* were all identified significantly more frequently by the general population. S*leepiness* was identified as a symptom significantly more frequently by the pregnant women group.

Yellowish eye was most frequently reported as the most troubling symptom in both groups, but more frequently by the general population group. Pregnant women more frequently reported *paleness or shortage of blood* and *chills and rigors* as most troubling symptoms. *Weakness*, *sleepiness* and *lose of appetite* were reported by similar proportions in both groups as most troubling.

Table 26 Symptoms identified and most troubling symptoms for MRI in pregnancy

Categories of distress[1]	How reported[2]					Most important		
	General population (n=100)		Pregnant women (n=100)			General population (n=100)	Pregnant women (n=100)	
	Total (%)	Fraction spont.	Total (%)	Fraction spont.				
Fever related symptoms	96.0	0.82	95.0	0.76		36.0	32.0	
Yellowish eyes	92.0	0.84	90.0	0.77		30.0	17.0	**
Chills and Rigors	x	x	x	x		1.0	8.0	**
Yellowish urine	x	x	x	x		1.0	5.0	*
Hot body	x	x	x	x		4.0	2.0	
Sweating	64.0	0.03	49.0	0.06	**	0.0	0.0	
Non specific symptoms	100.0	0.84	100.0	0.85		57.0	62.0	
Weakness	94.0	0.57	83.0	0.46	**	15.0	12.0	
Paleness/shortage of blood	78.0	0.36	77.0	0.38		3.0	12.0	**
Sleepiness	19.0	0.26	40.0	0.23	**	7.0	11.0	
Lose of appetite	82.0	0.97	85.0	0.74		12.0	8.0	
Weight loss	75.0	0.17	80.0	0.20		8.0	8.0	
Vomiting	x	x	x	x		5.0	4.0	
Headache	x	x	x	x		0.0	3.0	*
Diarrhoea	94.0	0.62	93.0	0.68		1.0	2.0	
Breathlessness	46.0	0.07	30.0	0.03	**	2.0	1.0	
Bitterness in the mouth	53.0	0.47	47.0	0.49		1.0	1.0	
Joint and bodily pains	63.0	0.17	65.0	0.19		2.0	0.0	
Easily startled	39.0	0.05	17.0	0.06	**	1.0	0.0	
Dizziness	x	x	x	x		0.0	0.0	

1 Symptoms analysed as groups (in bold) based on reported categories that follow.

*p ≤.10, ** p≤.05. Wilcoxon test for comparison of prominence of reported categories (2 = spontaneous, 1 = probed response, 0 = not reported), and fisher's exact test for most important perceived causes.

[2]Column values indicate frequency of reported categories and the fraction of these reported spontaneously. Column values for reported symptoms marked x indicate categories specified in the vignette

7.5.9 Perceived Causes

Similar perceived causes were reported by both groups (table 29). *Mosquito bites* were the most frequently reported cause in both groups, followed by exposure to *heat from the sun*. Multiple perceived causes were compatible, even among those identifying mosquitoes: “Mosquitoes bite is one of the causes. It could also be due to the kinds of food that we eat, foods containing too much starch and fats. The heat from the sun can also cause it” A pregnant woman referred the synergistic effects of heat and hard work in discussing the cause of illness: “Being in the sun for a long time as well as doing hard works are some of the causes of this problem”.

Table 27 Perceived causes, and the most important perceived causes for MRI in pregnancy

Perceived causes reported[1]	How reported[2]					Most important		
	General population (n=100)		Pregnant women (n=100)			General population (n=100)	Pregnant women (n=100)	
	Total (%)	Fraction spont.	Total (%)	Fraction spont.				
Insect bites								
Mosquito bite	94.0	0.45	98.0	0.51		34.0	30.0	
Exposure	93.0	0.60	98.0	0.58		35.0	38.0	
Heat from the sun	91.0	0.76	98.0	0.76		33.0	36.0	
Airborne/exposure	21.0	0.33	21.0	0.31		2.0	1.0	
Cold or beaten by rain	12.0	0.08	19.0	0.05		0.0	1.0	
Food and drink	92.0	0.30	97.0	0.32		7.0	15.0	**
Fatty/oily food	86.0	0.14	86.0	0.20		4.0	8.0	
Unripe or premature fruits	73.0	0.11	65.0	0.08		0.0	4.0	**
Eating unbalanced diet	13.0	0.08	21.0	0.24		3.0	1.0	
Alcohol	25.0	0.12	19.0	0.05		0.0	1.0	
Impure water	20.0	0.50	35.0	0.34	**	0.0	1.0	
Eating starchy food	6.0	0.17	8.0	0.13		0.0	0.0	
Sanitation and hygiene	86.0	0.45	90.0	0.42		7.0	5.0	
Sanitation/dirty environment	31.0	0.68	38.0	0.40		1.0	4.0	
Personal hygiene/	38.0	0.58	45.0	0.36		6.0	1.0	*
Houseflies	32.0	0.50	38.0	0.50		0.0	0.0	
Infections	69.0	0.09	71.0	0.03		0.0	0.0	
Phlegm	25.0	0.04	24.0	0.0		0.0	0.0	
Worm infections	61.0	010	68.0	0.05		0.0	0.0	
Supernatural	74.0	0.04	61.0	0.00	**	1.0	1.0	
Evil eyes or sorcery/charm	45.0	0.04	42.0	0.00		0.0	1.0	
Spirits (Witches, gods and ancestral)	57.0	0.04	60.0	0.02		1.0	0.0	
Part of God's creation	28.0	0.04	15.0	0.00	**	0.0	0.0	
Hereditary/	91.0	0.71	96.0	0.59		11.0	9.0	

exertion/constitution						
Physical exertion/hard work	73.0	0.88	85.0	0.65	11.0	9.0
Hereditary	65.0	0.05	56.0	0.05	0.0	0.0
Constitution or blood weakness	8.0	0.38	15.0	100.0	0.0	0.0

1 Perceived causes analysed as groups (in bold) based on reported categories that follow.

*p ≤.10, ** p≤.05. Wilcoxon test for comparison of prominence of reported categories (2 = spontaneous, 1 = probed response, 0 = not reported), and fisher's exact test for most important perceived causes.

[2]Column values indicate frequency of reported categories and the fraction of these reported spontaneously.

She continues:"Mosquitoes can also cause Esi's problem, especially because she is pregnant, she could easily fall sick from a mosquito bite."

7.5.10 Prevention

Table 28 Preventive measures for MRI in pregnancy

	How reported[2]				
	General population		Pregnant women		
Categories of preventive measure[1]	Total	Prop. spont.	Total	Prop. spont.	
Insect bites					
Prevent mosquitoes' bite	88.0	0.32	92.0	0.27	
Medications (herbal & Biomedicine)	85.0	0.34	89.0	0.37	
Taking herbal or biomedicine medicines regularly	75.0	0.37	84.0	0.37	
Deworming regularly	39.0	0.05	53.0	0.06	**
Sanitation & hygiene	73.0	0.60	73.0	0.38	
Keeping personal hygiene	65.0	0.66	68.0	0.41	
Cleaning the environment	55.0	0.69	54.0	0.39	
Exposure and work	91.0	0.26	91.0	0.35	
Stay less in the heat (sun or fire)	88.0	0.24	85.0	0.33	
Reduction in strenuous or hard work	54.0	0.22	68.0	0.31	**
Avoid cold weather or stay less in the rain	4.0	0.0	15.0	0.0	**
Food & drink	81.0	0.17	80.0	0.14	

Eating balanced diet	32.0	0.69	43.0	0.70	
Avoid fatty or oily foods	62.0	0.16	67.0	0.24	
Eating less starchy food	27.0	0.37	33.0	0.15	
Drinking clean water	27.0	0.26	38.0	0.37	*
Eat on time	13.0	0.31	13.0	0.23	
Drink a lot of vegetable soups	9.0	0.33	22.0	0.16	**
Supernatural	36.0	0.00	39.0	0.03	
Attend to ancestral spirits and family gods	31.0	0.00	34.0	0.03	
Avoid offending evil spirits like the witches	13.0	0.00	22.0	0.0	*
Don't know/cannot tell	12.0	100.0	28.0	100.0	**

1 Preventive measures analysed as groups (in bold) based on reported categories that follow. *>p ≤.10, ** p≤.05. Wilcoxon test for comparison of prominence of reported categories (2 = spontaneous, 1 = probed response, 0 = not reported).

[2]Column values indicate frequency of reported categories and the fraction of these reported spontaneously.

Similar preventive measures were identified by both groups (table 30). Most of these preventive measures were linked with reported perceived causes, mostly measures to avoid these causes. *Preventing mosquito bite* was the most frequently reported preventive measure in both groups with no significant difference. *Staying less in the sun* was the second most frequently reported preventive measure by both groups. Pregnant women specified more often *deworming regularly*, *reduction in strenuous or hard work*, *avoiding cold weather or staying less in the rain* and *drinking a lot of vegetable soup* than the general population group.

7.6 Discussion

Findings reported in this paper draw attention to the specific needs of pregnant women to control malaria in pregnancy. The study shows that despite similarities in the accounts of pregnant women and the general population, pregnant women indicate vulnerabilities to MRI attacks more substantially than respondents in the general population group. For example, pregnant women were particularly concerned about ingestion, more frequently identifying it as most important cause. This appeared to affect their concerns about effects on the foetus, whose well-being and protection is a major concern for them. Number of symptoms, diversity of help-seeking indicates sensitivity to broader recognition of symptoms and particular

symptoms such as breathlessness by pregnant women.

The result shows that local people are aware that malaria in pregnancy is serious, but pregnant women were more concerned about mortality. This reflects gender perceived vulnerability to malaria among pregnant women. Their concerns are biomedically justified and a recognised interest of malaria (WHO, 2003a). Our finding of low priority for timely treatment requires attention. Most respondents in both groups recommended outside help-seeking at or after 72 hours, consistent with local view of timeliness, where actions taken within 72 hours are considered timely. This mismatch between professional and local ideas about timely treatment constitutes a challenge for malaria control, since 72 hours delay for treatment is too long. The question arises, how might availability of drugs at or near the home lead to timely, appropriate and effective treatment within 24 hours of illness onset? In the absence of a current local priority for that, appreciation of the need to treat suspected malaria cases within 24 hours requires strengthening. Attention to that is necessary if the burden of malaria in pregnancy is to be reduced (Murphy & Gaps, 2001; Steketee *et al*. 2001; van Geertruyden *et al*. 2004). Furthermore, this culturally accepted timeliness was also found to contribute negatively to timely, appropriate treatment seeking for childhood malaria as reported in chapter 4.

The use of *herbal medications* were reported at a similar frequency in both groups, but due to the concern raised by pregnant women about harmful effects on the foetus, pregnant women gave it less prominence, reporting it more often only after probing, while the general population group was more likely to report it spontaneously. Fear of adverse effects of herbal medications on the foetus may limit use of herbal medications by pregnant women, but not use of biomedical drugs. This view may encourage prospects for the acceptance of intermittent preventive treatment (IPT) for malaria control in pregnant women.

There was broad agreement between the general population and pregnant women on the sources of outside help suitable for pregnant women to manage MRI. However, pregnant women emphasised the role of *drug shop keepers*, *religious leaders*, and *traditional birth attendants*, and these sources require attention for malaria control in pregnancy.

Most pregnant women who were interviewed had attended antenatal clinics at least once, and one expects they may access IPT interventions at these clinics. This argument might be particularly convincing because this number met the Abuja target (at least 60% of all pregnant

women at risk of malaria shall have access to intermittent preventive treatment by the end of 2005) (WHOa). However, this number is comparatively low especially considering the fact that this study took place in two village communities with easy geographical access to a centrally located community clinic or health post, which could be reached on foot, and which provided both antenatal services and IPT free of charge (Tanner & Vlassoff, 1998). Also we have to bear in mind that some of the pregnant women went to the clinic only in the months prior to delivery, and they had not received IPT for greater portion of their pregnancy.

In more remote communities, fewer pregnant women have access to such antenatal services. The distance to sparse service and poor transportation are barriers to access. Consequently, providing intermittent preventive treatment for pregnant women through community-based services would improve coverage, and be most effective if combined with antenatal care. Furthermore, IPT relies on regular clinic attendance, which may not be the case in most of rural Ghana.

A number of malaria prevention measures were reported significantly more frequently by pregnant women than by the general population, and some of these are an expression of the general socio-economic position of women with regard to their daily activities. For example, r*eduction in strenuous or hard work* and *avoiding exposure to the rain or cold weather*, are all related to the kind of work women in the study communities must do. Women, pregnant or not, in our study communities are engaged in hard labour such as farming, fishing and petty trading, which involves walking with their wares on top of their heads over long distances, and often in the rain during the rainy season or staying in water over extended period while fishing. Consequently, they associate these conditions with malaria transmission which peaks during the rainy season. Local experience indicates how these links to causes of malaria operate and how they suggest ideas about prevention.

Respondents' frequent emphasis on mosquito bites as a cause of malaria and focus of prevention differs from earlier reports from research conducted in southern Ghana, where very few people mentioned mosquitoes as the cause of malaria (Ahorlu *et al*. 1997; agyepong 1992). This more recent view may both reflect experience using and indicate potential acceptance in promoting insecticide treated nets for malaria control.

This study of malaria affecting pregnant women, depicted in a vignette, compared local experience, meaning, and behaviour reported by pregnant women with perceptions of non-

pregnant women and men residing in the two study communities. Findings indicated agreement in perceptions of malaria and the priority of treatment, but also showed how the experience of pregnancy affects perceptions of malaria. Pregnant women show greater sensitivity to symptoms and greater perceived vulnerability. The greater priority for help-seeking recommended by pregnant women indicates potential for acceptance of IPT.

Chapter 8: General Discussions And Conclusions

This thesis reports research examining various sociocultural factors relevant for intervention to reduce malaria burden in children and pregnant women. The thesis specifies problems of malaria-related childhood mortality from timely help-seeking and the role of convulsions, and also malaria in pregnancy.

This chapter presents the overall discussions and conclusions of the thesis, though detailed discussions of the findings are discussed in individual papers presented in chapter 3 to 7. We start with discussion on methodological issues, followed by brief summary discussions of each paper reported in chapter 3 – 7, and continue with some general discussions, recommendations and conclusions.

8.1 Methodological Issues

The research applied the cultural epidemiology framework, based on interdisciplinary approach frameworks and methods of anthropology and epidemiology, to priority questions for malaria control. This involved the development of semi-structured EMIC interviews to study insiders' illness perspectives (Weiss, 1997, 2001). EMIC interviews are instruments for assessing representations of illness or specified health problems from the perspective of affected persons, their family members or community members.

Cultural epidemiology with its focus on the occurrence and distribution of local representation of illness experiences, meanings and behaviour plays a complementary role to basic epidemiology, and anthropology for a better understanding of the problem locally to enhance the effectiveness of control initiatives. By adapting and developing further the cultural epidemiological tool of EMIC interviews, we were able to highlight the relevance of local experiences of malaria-related illnesses, their meanings, and both risk-related and help-seeking behaviours in the community. We were also able to identify both the nature and the distribution of illness experiences, meanings, and behaviours and this led to a better understanding and the establishment of, for example, the relationship between febrile malaria and convulsions, and also demonstrated the triad relationship between mosquito-malaria- and convulsions in the local populations studied.

The use of vignettes to focus respondents' attention away from their personal experiences proves to be a useful way to gather self-reported data to minimize bias due to concealment of information when personal guilt and responsibilities are involved. This is because vignette-based accounts compared favourably with case-based accounts in terms of categories reported, despite the fact that case-based respondents were limited to what they saw in, or did for a given particular malaria related illness episode, while the vignette-based respondents have no such limitations and were free to provide as much information as they have in their cognitive knowledge base.

The use of EMIC interviews require methodological rigor. It requires a systematic approach to coding, analysis, and presentation of local categories of experience, meanings and help-seeking behaviours to combine the relevance of anthropology and the power of epidemiology, involving integration of quantitative and qualitative methods for health research (Weiss, 2001).

8.2 Specific Issues Discussed For Each Paper In The Thesis

8.2.1 Ethnographic Study

Ethnographic study was conducted to understand the local perceptions and practices associated with malaria-related illness. The ethnographic component was necessary to identify pertinent categories to inform the design of the cultural epidemiology study. One cannot design any meaningful cultural epidemiological study without first having to identify local illness categories and representations. As in many other studies, this study has shown that febrile episode of MRI was a well-recognized common health problem affecting every member of the community, but more especially children and pregnant women. Convulsion was also recognised as childhood illness.

The ethnographic study confirmed earlier reports across sun-Saharan Africa that the home is the starting point for the treatment of malaria-related illness using herbs collected and prepared at home, analgesics and chloroquine or other available antimalarials are also use at home. (Deming *et. al.,* 1989; Rooth & Bjorkman 1992; Snow *et. al.,* 1992; Ruebush *et. al.* 1995; Mwenesi *et. al*., 1995; Ahorlu *et. al.,* 1997; Dunyo *et. al.,* 2000).

8.2.2 Sociocultural Determinants Of Treatment Delay For Childhood Malaria-Related Illness

In this paper (chapter 4) we analysed sociocultural determinants of treatment delay in our study villages. In the literature, it was largely reported that people may not seek early appropriate treatment for MRI because of barriers imposed by poverty, such as inability to pay for both the direct and indirect cost of treatment, distance from treatment source, poor accessibility (including transportation problems), provider attitudes towards patients and inadequate drug stocks, (Jowett & Miller 2000; WHO 2003; Williams & Jones 2004).

Our Findings, however, show that factors relating to experience, meaning and behaviour, or what Helman (2000, p 219) called “cultural factors”, must also be considered among determinants of prompt appropriate and effective treatment of young children with suspected MRI. A majority of the children studied did not receive timely, appropriate treatment; only 11% of the children met the Abuja target of receiving appropriate treatment within 24 hours (WHO 2000). This must be worrying indeed, as it demonstrates that in rural communities, represented by our study areas, the target of 60% of suspected malaria patients (children under five) receiving appropriate treatment within 24 hours of illness onset may not be met by the close of 2005. Even getting children into appropriate treatment within 48 hours was well below the target set in Abuja.

Findings presented in this report questions whether even when effective home treatment becomes a widely available treatment as a strategy for malaria control to the majority of the population, with local expertise about its value and use, delay initiating treatment may nevertheless limit prompt, appropriate and effective treatment. This is because delay in getting a child into treatment does not depend only on drug availability or money to buy them but also socio-cultural factors that influence a decision to seek help is influenced by sociocultural variables emanating from experience, meaning and behaviour associated with malaria-related illness. Our study communities have health posts centrally located, but the majority of the people did not go there for timely appropriate treatment, and this could not be blamed solely on poverty or inability to pay for drugs and services, or traditional beliefs about care, as other studies also suggest (De Savigny et al. 2004). Questions about what constitute timely for the local people and the priority of treatment within 24 hours also play important roles.

8.2.3 Saying And Doing: Comparing Vignette-Based Accounts With Case-Based Experience Of Childhood Malaria-Related Illness In Southern Ghana

Valid, reliable, and comparable measures of health are critical components of evidence-based public health policy and clinical practice, control programme design, implementation and evaluation. The paper reported in chapter four reported what people said should be done to the child in vignette depicting childhood MRI compared to what caretakers actually did for their children suspected of having MRI.

Similar cultural epidemiological variables of PD, PC, SH, HS and CP, were reported by respondents in both groups, although most of these categories were reported significantly more frequently by respondents in the vignette-based group than in the actual case-based accounts. It was so because case-based respondents reporting what they have actually experienced and did for their children who were suspected of having malaria, while vignette-based respondents were making use of their cognitive knowledge with reference to the scenario presented in the vignette. Despite these differences, control programmes could rely on vignette-based accounts to identify the determinants and distributions of relevant local sociocultural variables for intervention by incorporating their use in community IEC designs.

Timely, appropriate treatment for childhood malaria is a key feature of global malaria control efforts. However, our finding shows that majority of the children suspected of having malaria did not received treatment within 24 hours as envisaged by the global control programme, and even more worrying was that only 9.0% of vignette-based respondents recommended treatment within 24 hours of illness onset bearing in mind that they were just saying rather than doing the action. This finding demonstrates that perceived priority of timely treatment must be seriously considered with the current and appropriate focus on access to competent services and medicine. It has a serious implication for disease control and requires more serious and concerted effort on the part of local health authorities in collaboration with communities to improve the situation through targeted simple clear messages emphasising the importance to treat childhood MRI within 24 hours but not on or after 72 hours as reported by respondents.

Although we cannot draw definite parallels between vignette-based and actual case-based accounts based on this study alone, we recommend that EMIC interviews framework should be considered a useful tool for generating rapid data to show the determinants and

distributions of illness-related sociocultural categories in populations to inform interventions and programme evaluations.

8.2.4 Community Concepts Of Malaria-Related Illness With And Without Convulsions In Southern Ghana

In chapter five, we compare MRI with convulsions and without convulsions to understand how their similarities and differences affect malaria-related illness experience meaning and behaviour in the local population. Findings show that the majority of respondents have linked the two presentations together. Clinic or hospital were the most frequently recommended places to receive treatment for both presentations, even though supernatural causes continue to loom large among the perceived causes reported for convulsions. This departs from most reports across sub-Saharan Africa, where these two presentations are usually considered as separate illnesses with no relationship with local healers being the primary source of treatment for convulsions [6, 7, 8, 9, 19]. The emerging local awareness of the link between mosquitoes, malaria, and convulsions should be utilised to deliver acceptable control programmes as this may build on local understandings to clarify these relationships and present it in a simple educational message emphasising the importance of the three components (mosquito-malaria-convulsions).

In conclusion, the use of vignettes to compare MRI with and without convulsions has shown that there are more similarities between MRI with or without convulsion than is usually reported from sub-Saharan Africa. Most reports show that convulsion was mostly considered as a different or separate illness with spiritual causes and largely treated by local healers [4, 6, 7, 8, 20]. This connection between convulsive and non-convulsive malaria-related illness in local perception should be recognised and addressed in community public health priorities for malaria control.

8.2.5 Malaria-Related Illness In Pregnancy: Comparing Vignette-Based Accounts Of Pregnant Women And The General Population

MRI was reported as a major problem for pregnant women, confirming what is bio-medically known that pregnant women are the adult group most at risk in malaria endemic regions of the world, especially in sub-Saharan Africa. Being pregnant did not alter the experiences, meanings and behaviours of pregnant women significantly, in many respects, from that of the

general population about malaria in pregnancy. This was expected as the local people shared in the same sociocultural world view from which they derived their experiences, meanings and behaviours. However, there were some gender specific issues that were raised by pregnant women. For instance, pregnant women may be consulting *drug shop keepers for advice*, *religious leaders*, and *traditional birth attendants* more frequently than was perceived by the general population.

Pregnant women were also more concerned about *ingestion* and *physical exertion/hard work* as causes of MRI and have reported preventive measures targeted at these causes more frequently than the general population. These findings have implications for malaria control in pregnancy, and support the need for a gender specific programme that takes into account the experience, meaning, and behaviour of this vulnerable group for intervention (Tanner & Vlassoff, 1998).

Findings suggest that recent efforts to introduce intermittent preventive treatment in some malaria endemic countries, including Ghana, are likely to be an effective strategy for malaria control. Given that 61.0% of pregnant women interviewed have attended antenatal clinics at least once (mean duration of pregnancy 5.5 months with a standard deviation of 1.2), the recent introduction of intermittent preventive treatment at these clinics may help to reduce the incidence of MRI in pregnancy. However, relying solely on health facility-based delivery of IPT to pregnant women assumed that pregnant women will attend antenatal clinic consistently as required to make the intervention effective. This may not be the case, as most pregnant women in rural Ghana do not attend antenatal clinic regularly, especially in communities where access to health facilities could be difficult not only because of poverty-related constraints and transportation problems, but research needs to clarify other sociocultural factors influencing clinic attendance.

8.3 General Comments And Recommendations

Reduction in malaria-related morbidity and mortality is an unambiguous priority in sub-Saharan Africa. Although there is enough evidence to suggest that malaria-related morbidity and mortality could be reduced through appropriate use of control tools (Muela *et al* 2002). An important component of the mosquito-parasite-human triad is the human behaviour influenced by illness-related experience meanings and expectations that motivate behaviour.

Many malaria control programmes in Africa have failed because of combined factors including the efficiency of the vector *Anopheles gambiae*, and both technical and political problems constraining these control programmes. Political commitment of Africa governments and lack of financial resources to sustain the control activities are widely recognised views; it has also been widely acknowledged for nearly half a century that the behaviour of residents has not been adequately studied to guide the design and implementation of those programmes (Bruce-Chwatt & Archibald, 1958). In the past few decades, however, there has been an increase in social science research on malaria. However, most of these researches have been descriptive accounts of causes, recognitions, classifications and treatment-seeking behaviour with the aim of identifying local illness categories that corresponds to, or deviate from biomedical categories, also considering implications for intervention (Hausmann Muela *et al*. 2002). In other words, most social science research on malaria was knowledge, attitude, beliefs and practice (KABP) studies with very little comparative and analytical potential contributing to the vastly growing literature on other aspects of malaria (Williams and Jones 2004). Also, the distributions of local MRI categories and their implications for malaria control have received very little attention in the health social science literature.

Major social science changes in the structure of communities are taking place in Ghana. Our findings reveal that female-headed households are becoming more important in traditional Ghanaian communities, where men have traditionally been heads. This is due largely to the increasing number of unmarried mothers as more women are having children without marital union, but also due to an increase in teenage pregnancy. This phenomenon and its impact on restructuring household support networks require study to determine its implications on health and malaria control.

A departure from earlier studies in southern Ghana (Ahorlu, *et al*. 1997; Agyepong 1992) was identification of mosquitoes as a leading perceived cause of MRI in our two study villages. However, knowledge that mosquitoes cause the illness did not necessarily translate into prospective (vignette-based) or actual (case-based) timely, appropriate treatment-seeking. Nonetheless, such emerging community views may encourage the acceptance of self-protective measures, such as the use of insecticide treated nets and related interventions.

The perceived link between MRI and the heat from the sun should be considered by health

professionals, especially clinical epidemiological researchers, to confirm or reject the lay hypothesis "that exposure to excessive heat (sun) triggers clinical malaria episode." Experimental animal models (mice) may be relevant. Yamamoto *et al*. (2000) found that mice exposed to UV-B-irradiation have their immune mechanism to eliminate or control the Plasmodium chabaudi parasite at the late stage impaired. The naturally resistant experimental mice (B-10) exposed to UV-B for 2 hours and infected with mouse malaria parasite (P. chabaudi) died within 12 or between 1and 2 days after the peak of parasitemia. As discussed in chapter 4, this should encourage us to take this "causal" theory of lay people more seriously. We should be interested in the triggers of clinical episodes of malaria-related illness, especially in children and pregnant women because it is the clinical episodes that cause morbidity and mortality in these vulnerable groups. The sun causal model of malaria is common across Africa (Ahorlu *et al*., 1997; Gessler *et al*., 1995; Winch *et al*., 1994, WHO 2003).

Various ideas about prevention and control of malaria-related illnesses were related to local perceived causes and were mostly the avoidance of these causes. Our findings suggest that local priorities for taking medications (herbal and/or biomedicine) to prevent malaria-related illness indicate potential for alliances of communities and control programme strategies, such as intermittent preventive treatment for pregnant women.

Our findings also show that the impact of cultural factors on timely, appropriate treatment seeking cannot be dismissed as solely a result of ignorance or lack of knowledge about the causes of MRI. This is because most people reported mosquitoes as a perceived cause of MRI, but this did not influence timely, appropriate help-seeking within 24 hours recommended in the Abuja target aiming at 60.0% by the close of the year 2005. Only 11% out of the 100 children with suspected malaria received appropriate treatment within 24 hours of illness onset, and the situation was no different from what was recommended by vignette-based respondents for children and pregnant women.

Although home-based treatment is increasingly emphasised in Ghana as an effective tool for controlling malaria morbidity and mortality, it remains more a policy consideration that has only been carried-out on trial basis, but not yet been implemented in the study communities. As these changes are implemented, however, future studies should consider not only timely, appropriate outside help-seeking, but also home-based treatment as a desirable outcome for

preventing childhood mortality due to malaria.

As communities go through daily experiences, coupled with new information, formerly held interpretations and meanings will change and this will continually influence the behaviour of the individual and community at large. Therefore, there is the need for regular re-evaluation of community experiences, meanings, and behaviour to regularly review and adapt control programmes to the changing needs of local people.

8.4 Recommendations

Health education messages should focused on the importance of treating MRI within 24 hours. Care should be taken in the use of technical words, like “timely” or “prompt” because these may mean entirely different time frames for local people. For example any action taken within 72 hour is considered timely or prompt in our study communities, but this constitutes delay for malaria treatment, especially for children.

IPT should be introduced at the community level to broaden access for pregnant women in rural communities with no easy access to health.

A way should be found to initiate similar IPT control programme for children at the community level to reduce malaria-related childhood morbidity and mortality.

Public health and social science researchers should consider the use of vignette-based EMIC interviews to generate self reported data for control programme design and evaluations. This technique has proved useful in our study by generating categories comparable to case-based interviews.

This connection between convulsive and non-convulsive malaria-related illness in local perception should be addressed in community public health priorities to enhance malaria control.

Therefore, there is the need for regular re-evaluation of community experiences, meanings, and behaviour to regularly review and adapt control programmes to the changing needs of local people.

8.5 Further Research Questions

Research is needed to clearly understand the occurrence, determinants and distributions of emerging treatment mix for convulsions involving traditional healers driving away causal spirit, paving the way for the effectiveness of modern medications at the clinic/hospital, and then, traditional healers providing medications to protect the child from subsequent attacks.

Further research to clearly show the level and distributions of herbal treatments in local communities, and how this relates to access to biomedical treatments and drug use in the community.

Research into the feasibility and effectiveness of introducing IPT at the community level for both pregnant women, and children as a part of home-based management strategy to improve access to available effective drug treatment.

There is the need to conduct clinical research to assess the relationship between the exposure to heat, especially from the sun and the triggers of clinical malaria episodes.

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Appendix 1

Appendix 1a: FGD guide

Introduce yourselves and let the respondent also introduce him or herself. State the purpose of the discussions and reassure respondents of the confidentiality of information that will be given. Tell respondent that you are coming to learn from him/her since he/she knows more about what goes on in the community than you do.

1. What are the most common illnesses in this community?

2. Among all the illnesses mentioned which one is the most serious one? Probe: why it is considered the most serious, for children, and pregnant women.

3. If no malaria-related illness is mentioned, introduce it and ask for the local name(s) /term(s).

4. Ask if malaria (local name) is a problem in the community? Probe: febrile malaria, convulsion, anaemia, and enlarged spleen. Probe: problem in children, and pregnant women. Why it is considered a problem in a particular group mentioned?

5. How does malaria start and how does it develop? Probe in children and pregnant women

6. What signs and symptoms do you normally see or experience when you or a member of your household including children have malaria? Probe: all possible signs and symptoms

7. If you see those signs in your child or yourself or spouse, what do you normally do first?

8. Do we have different types of fevers? Probe: convulsion.

9. If you or any members of your household get malaria who do you inform or consult first for advice or assistance? What type of assistance do you usually receive from the person (s)?

10. What causes malaria-related illness? Probe: febrile episodes, convulsion.

11. Does what you perceived to be the cause affects your treatment choice? (Relate each cause mentioned to possible treatment choice) Probe: febrile episodes and convulsion.

12. Who are the treatment providers for each of the conditions? Probe: convulsion and febrile malaria. Which one of these are considered the best and why?

13. Who are at risk of getting malaria-related illnesses? Probe: children and pregnant women.

14. Can we prevent these illnesses? Probe: all possible preventive measures

15. What do you normally do to prevent malaria? Probe: convulsion and febrile episodes.

16. What are the best ways to prevent malaria-related illnesses? Probe for mosquito bite prevention, stay less in the sun etc

18. When do you consider malaria-related illness as severe: Probe, how do the perceived severities affect treatment behaviours including time to seek for care and from where?

19. At what stage of malaria illness do you decide to seek help from a provider? Why

20. Where do women go for advice when they are pregnant? Probe, when she is not well, the social network involved in decision making on pregnant women's ill health? Are pregnant women allowed to take biomedicine? Probe for those that they are not allow to take if any and possibly their names or identities and ask why they are not allowed to take them.

21. Can we identify the local healers or local treatment providers that we have in and around this community? How many different kinds or groups do we have and how do we group them. What make one group different from the other? Probe for the type of services each provides. Including, diviners, herbalists, faith healers, shrine owners, knowledgeable and experience persons, traditional birth attendants (TBAs) etc.

22. About how many of each do you think we have in and around this community that people consult when someone is ill or sick? Probe: their names and locations as much as

possible.

23. What types of illnesses are taken to each type of local healers? Probe for, febrile malaria, convulsion. Also ask for the preferred place to treat each of them and ask why? Have there be any change in the role of the local healers in this community? What are the changes if any and what account for it?

24. Do mosquitoes worry you in this community? How do they worry you? Probe for biting, nuisance, disturb sleep, give illness etc.

25. If illness is mentioned above, probe for which illnesses. If mosquito is not mentioned as a cause of malaria, ask if it can give malaria and probe why and how.

26. What do you do to protect yourselves and your family from mosquito bite? Probe: all possible mosquito preventive means (bednet, insecticide spray, coils, herbal repellent and other local means).

27. Do people sleep under bednet in this community? Probe: who sleep under bednet children and pregnant women, rich people, educated, health worker, etc and reasons for sleeping under bednet.

28. Are you aware that some bednets are treated with insecticide to make them more effective against mosquito? Probe: source of knowledge or information, price for both treated and untreated nets.

29 Do people have insecticide treated bednets in this community? Probe for have it, rich people, educated, health workers etc.

30. Will people with bednets be willing to treat their bednets with insecticide? Will people be willing to buy insecticide treated bednets to prevent mosquito bite? Probe how much they will be willing to pay for the insecticide to treat existing net and how much they can afford to buy a new treated bednet.

31. How do you usually receive or get health messages or information? Probe: radio, TV, Health workers, teachers, school children, family members coming from towns, durbars etc.

32. Local knowledge on resistance and how treatment failures are perceived if identify.

Appendix

What account for some people not recovering early or fully after receiving treatment or taking medicine?

Appendix 1b: In-depth interviews guide

Introduce yourselves and let the respondent also introduce him or herself. State the purpose of the discussions and reassure respondents of the confidentiality of information that will be given. Tell respondent that you are coming to learn from him/her since he/she knows more about what goes on in the community than you do.

1. What are the most common illnesses in this community? Probe: childhood and pregnant women

2. Among all the illnesses mentioned which one is the most serious one for children/pregnant women? Probe: why it is considered the most serious.

3. If no malaria-related illness is mentioned, introduce it and ask for the local name(s) /term(s).

4. Ask if malaria (local name) is a problem in the community? Probe: different types of malaria including convulsions in children. Whether it is considered a problem or not?

5. How does malaria (related illnesses) start and how does it develop in children/pregnant women? Probe: uncomplicated malaria and convulsions.

6. What signs and symptoms do you normally see or notice to know that a child/pregnant woman is developing or having malaria-related illnesses? Probe: all possible signs and symptoms.

7. If you see those signs and symptoms in the child/pregnant woman, what do you normally do first?

8. Are there different types of fevers in children/pregnant women? Probe: each type and causes. Ask the same for convulsion.

9. If you suspect that a child/pregnant woman are having malaria-related illness, who do

you inform or consult for advice and support or assistance? What type of advice or assistance do you usually receive from the person (s)?

10. What causes malaria-related illness? How can one get infected with malaria? Probe: febrile episodes, convulsion.

11. Does the perceived causes affect treatment choice? (Relate each cause mentioned to possible treatment choice) Probe: febrile episodes, convulsion.

12. Which treatment providers do you prefer probe for childhood illnesses/pregnant women? Probe: convulsion.

13. What makes children/pregnant women vulnerable to malaria-related illnesses? Probe: Febrile malaria, convulsion.

14. Can we prevent these illnesses? Probe: all possible preventive measures for febrile malaria, convulsion.

15. What do you normally do to prevent malaria? Probe: convulsion and febrile episodes.

16. How best do you think we can prevent malaria-related illnesses especially in children or pregnant women? Probe: sleeping under bednet, environmental control, insecticide spray, herbal repellent, coils etc.

17. Apart from treating at home where else to you go to seek for help when for malaria-related illness in children or pregnant women? Probe: each provider identified and where they are located. Estimated cost per consultation/visit for children for febrile malaria and convulsion

18. When do you consider malaria-related illness severe in children or in pregnant women? Probe: how the perceived severity affects treatment behaviours including timing.

19. At what stage of malaria-related illness do you decide to seek for help from a provider? Why? Probe: Febrile malaria and convulsion in children.

20. Where do you usually go for advice when someone (a child/ pregnant woman) is not well? Probe for children and Probe: the social network involved in decision making on

children's ill health or pregnant women (financial, decision to seek care outside the home etc).

21. Can you identify local healers or treatment providers in and around this community that help people (children and pregnant women) when they are not well? How many different kinds or groups of healers do we have? What are the groupings and what makes one group different from the other? Probes: types of services each provide. If not mentioned ask about diviners, herbalists, faith healers, shrine owners, knowledgeable/ experience persons, traditional birth attendants (TBAs) etc.

22. What types of illnesses are usually taken to each type of local healers identified? Probe: febrile malaria and convulsion. Also ask about the preferred place to treat each of these conditions and ask why?

23. Do mosquitoes worry you in this community? How do they worry you? Probe: for biting, nuisance, disturb sleep, give illness etc.

24. If illness is mentioned above, probe for which illnesses. If mosquito is not mentioned as a cause of malaria, ask if it can give malaria and ask how.

25. What do you do to protect yourselves especially children and pregnant women from mosquitoes' bite? Probe: all possible mosquito preventive means (bednet, insecticide spray, coils, herbal repellent and other local means).

26. Do people sleep under bednet in this community? Probe: who sleep under bednet children, adults, and pregnant women, rich people, educated, health worker, etc and reasons for sleeping under bednet.

27. Are you aware of insecticide treated bednets which are more effective against mosquitoes' attack? Probe: the source of information, price for both treated and untreated bednets.

28. Do people treat their bednets with insecticide in this community? Probe: who treat, rich people, educated, health workers etc.

29. Will people be willing to treat their bednets with insecticide or buy insecticide treated bednets to prevent mosquitoes bite? Probe: how much they can afford to pay for the

insecticide to treat existing net and how much they can afford to buy a new treated bednet.

30. How do you usually receive or get health messages or information in this community? Probe: radio, TV, Health workers/clinic, teachers, school children, people returning from towns and cities, community durbars, etc.

31. Ask about local knowledge on resistance, and how treatments failures are perceived. What accounts for some people not recovering early or fully after receiving treatment or taking medicine?

Appendix 2

Structure of the four EMIC Interviews tools for various respondents

1. Sociocultural characteristics
Demographic data, indicating age, sex, religion, marital status, education, occupation, household income, headship of household and number of children (under 5, under 18 and above 18 years of age) alive and dead.

2. Identification of the condition depicted in vignette and local name(s) of term (s)

3. Patterns of distress (spontaneous and probe responses, and narrative accounts)
Typical symptoms
Most troubling symptoms
Effect of the condition on the family
Most troubling effect on the family

4. Perceived seriousness and fatality

5. Perceived causes (spontaneous and probe responses, and narrative accounts)
Causes
Most important cause

6. Absence from work or school and the likely person to stay away

7. Help-seeking (spontaneous and probe responses, and narrative accounts)
Self-help at home and their effectiveness
Outside help-seeking sources and their effectiveness
How long to wait and observe before seeking outside help
Importance of seeking help within the stated time

8. Control and prevention (spontaneous and probe responses, and narrative accounts)
Could the condition have been prevented
Can it be prevented from attacking other children in the community

9. Last time respondent saw someone with suspected malaria

10. Last time respondent saw pregnant woman with suspected malaria

11. Last time respondent saw a child with convulsions

12. How many people with suspected malaria respondent saw in the past one month?

13. Respondent ever had malaria and how long was the last episode.

Additional features of the case-based EMIC interview tool

How long the child has been ill or when first notice that the child was not feeling well
Social support (financial, medicine, food, suggest treatment options and visit)
The kind of outside help sought
Cost of travel
Distance and time to get there
Cost of treatment (medicine and consultation)
Financial strain of treatment
Added burden for the family
Most effective treatment received
Additional help to be sought

Additional features of the vignette depicting a pregnant woman
Number of pregnancy
Clinic visits

Vignette depicting malaria-related illness with convulsions

Introduction to vignette

‘I appreciate your agreeing to talk to me about a problem that affects many children in this district. I want to understand how you think about it. Keep in mind that it is your ideas that I am interested in, so please do not feel there is a right or wrong answer to the questions I will ask you. Do not be shy to tell me what you think. So then, let me tell you a story about a child called Kofi/Ama who has this problem.’

MALE	FEMALE
‘Kofi is a 2½ year-old boy who had been feeling fine and playing happily. One day last week, Kofi woke up crying, and his mother found that his body felt very hot. Kofi seemed to be feeling cold and he was shivering. This was on and off for some time and he refused to eat anything. His urine was yellow in colour. He has vomited too. A few hours later, he started rolling his eyes. With his eyes opened wide, he was shaking and became stiff’	‘Ama is a 2½ year-old girl who had been feeling fine and playing happily. One day last week, Ama woke up crying, and her mother found that her body felt very hot. Ama seemed to be feeling cold and she was shivering. This was on and off for sometime and she refused to eat anything. Her urine was yellow in colour. She vomited too. A few hours later, she started rolling her eyes. With her eyes opened wide, she was shaking and became stiff’

Appendix 5 vignette depicting malaria-related illness without convulsions

Introduction to vignette

‘I appreciate your agreeing to talk to me about a problem that affects many people in this district. I want to understand how you think about it. Keep in mind that it is your ideas that I am interested in, so please do not feel there is a right or wrong answer to the questions I will ask you. Do not be shy to tell me what you think. So then, let me tell you a story about a child called Kofi/Ama who has this problem.’

‘Kofi is a 2½ year-old boy who had been	‘Ama is a 2½ year-old girl who had been

feeling fine and playing happily. One day last week, Kofi woke up crying, and his mother found that his body felt very hot. Kofi seemed to be feeling cold and he was shivering. This was on and off for sometime. He refused to eat anything. His urine was a yellow colour, and after a few hours, he vomited.'	feeling fine and playing happily. One day last week, Ama woke up crying, and her mother found that her body felt very hot. Ama seemed to be feeling cold and she was shivering. This was on and off for sometime. She refused to eat anything. Her urine was a yellow colour, and after a few hours, she vomited.'

Vignette depicting malaria-related illness in pregnancy

Introduction to vignette

'I appreciate your agreeing to talk to me about a problem that affects pregnant women in this district. I want to understand how you think about it. Keep in mind that it is your ideas that I am interested in, so please do not feel there is a right or wrong answer to the questions I will ask you. Do not be shy to tell me what you think. So then, let me tell you a story about a pregnant woman called Esi who has this problem.'

'Esi is a 30 year-old pregnant woman. She was 3 months into her pregnancy and was feeling fine until one day last week. She woke up that day with a bad headache and her body was hot. She felt cold and shivering. These bouts of cold and shivering would come and go. She felt dizzy and vomited twice within a few hours. She noticed her urine had a deep yellow colour'.

Curriculum Vitae

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Curriculum Vitae

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22nd – 25th August, 2001:	Advanced course in Medical Anthropology: The Anthropology of Medicines, Mbarara, Uganda.
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Membership in Professional Associations

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Work Experience

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