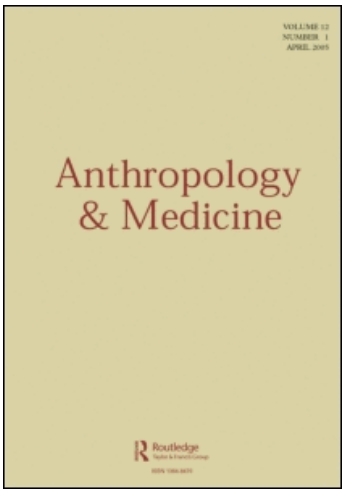

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Cultural interpretations of the efficacy and side effects of antimalarials in Tanzania

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This paper examines the cultural interpretations and the perceived efficacy and side effects of antimalarials in Tanzania. Interviews with 56 mothers of children diagnosed with malaria revealed that they were nostalgic about chloroquine, a banned antimalarial. Additional findings indicated that a majority of the mothers had an overall negative disposition toward sulfadoxine-pyrimethamine (SP), the first-line antimalarial. Mothers considered the persistence of fever as the primary undesirable side effect of SP, while also mentioning a range of other side effects. Mothers who could not afford an alternative to SP, rationalized the drug's side effects as indicative of disease egress. It is argued that ethnographic studies of cultural perceptions of malaria and antimalarials provide useful perspectives on how people negotiate the identity of a febrile illness, and how they understand and interpret the efficacy of existing antimalarials. In acknowledging the intra-cultural variability in perceptions of malaria and antimalarials, health policy makers must be cautious when implementing a 'one drug fits all' approach to malaria control.

Keywords: malaria; antimalarials; efficacy; side effects; ethnography; Tanzania

Introduction

Researchers have pointed out that the resistance of the malaria parasites, especially *P. falciparum*, to some of the widely available, low-cost antimalarials, such as chloroquine (CQ) and sulfadoxine-pyrimethamine (SP), is the most plausible single factor contributing to the staggering number of malaria-related deaths in sub-Saharan Africa (Snow et al. 2001). Not surprisingly, during the last few years there have been increasing calls for the large scale deployment of new generation antimalarials such as artemisinin-containing combination therapy – ACT (cf. Bosman and Mendis 2007; Kachur et al. 2004; Mutabingwa 2005). In Tanzania, malaria researchers and health policy experts have determined that some of the most commonly used antimalarials are no longer effective. Beginning in August 2001, the Tanzanian government banned the use of CQ and replaced it with SP as the first-line drug and Amodiaquine (AQ) as the second-line treatment for uncomplicated malaria. There is substantial information available on the process leading to the change in Tanzania's anti-malarial drug policy (cf. Mubyazi and Gonzalez-Block 2005; Williams et al. 2004). However, very little is known about how people who live

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in malaria endemic areas interpret the periodic calls made by researchers and policy makers to replace 'old' antimalarials such as CQ and SP with 'new' antimalarials such as ACT. How do ordinary people, in the context of their experiences with the old antimalarials, perceive the new antimalarials when they are deployed on a large scale?

Few studies have explored the indigenous cultural understandings of the efficacy and side effects of antimalarials (cf. Eriksen et al. 2005; Nsimba 2006; Tarimo et al. 2001). These studies have questioned the perceived efficacy of CQ and SP in Tanzania during the transition from CQ to SP as the first-line drug, but not from SP to ACT. Very little systematic research has been done on the cultural perceptions of SP in Tanzania five years after it replaced CQ as the first-line antimalarial. Further, there is very little ethnographic information on the process involved in the phasing out of SP and its replacement with ACT. No illustrative studies highlight the potential tensions experienced as a result of this transition, both at the policy-making level and at the community level. What has been the lay people's overall experience with SP as the first-line drug prescribed at public health facilities? Owing to the fact that SP has been sold under different brand names at the numerous pharmacies (*duka la madawa*) for more than five years, how concerned is the public with the plethora of brand name antimalarials available to them? How familiar and comfortable are lay people with SP as the first-line antimalarial? How might their experiences with SP, which is usually administered as a single-dose regimen, transfer onto their perceptions of ACT? How do their perceptions influence their 'adherence' to the new ACT drug regimen? In order for the new malaria treatment guidelines, which were formally introduced in December 2006, to be effectively implemented, there is a need to document the cultural perceptions of the existing antimalarials such as SP. This documentation must examine the perceived affordability, efficacy and desirable and undesirable side effects of existing antimalarials in specific cultural contexts. Documenting the cultural context of therapeutics includes acknowledging how western pharmaceuticals are reinterpreted through culturally specific modes of understanding (Bledsoe and Gaubaud 1988; van der Geest et al. 1990). There is a need to address the problem of the use of anti-malarial drugs in incorrect or sub-therapeutic doses at both the individual level and the community level.

Drawing on an ethnographic study, this paper focuses on the cultural meanings, the cultural interpretations and the perceived efficacy and side effects of two antimalarials, CQ and SP. These antimalarials have been most commonly used in Tanzania until recently. The paper draws on data that were gathered in Dar es Salaam a few months prior to the formal implementation of the new malaria treatment guidelines, which call for the large-scale deployment of artemether-lumefantrine (Coartem®) prescribed primarily through public health facilities. The paper discusses medical anthropologists' understanding of the efficacy and side effects of western pharmaceuticals when they are introduced in non-western contexts, and foregrounds the theoretical context to interpret ethnographic data. Next, the research setting and the methods used to gather the data are discussed, followed by the presentation of ethnographic data mostly derived from illness narratives. The socio-cultural factors underlying 'adherence' and 'non-adherence' to the prescribed antimalarials, and people's overall experience with SP as the first-line antimalarial ACT are discussed. Finally, the need to give due credence to the specific cultural

context and its influence on the assessment of drug efficacy and adherence, is emphasized.

Anthropological perspectives on efficacy and side effects of pharmaceuticals

Efficacy

In biomedicine, the signs of affliction are arranged hierarchically around a 'leading sign,' also construed as the clinical symptoms or biophysical manifestations of a disease. Other cultural and social signs are deemed less central categories and remain 'subjective' or 'non-specific.' Thus, the paradigm of biomedicine defines treatment mainly in biophysical terms, while considering cultural and social factors as 'noise' that affects therapy but does not seriously alter the therapeutic outcome (cf. Barnes 2004, 245; Etkin 1992, 100). Medical anthropologists who are critical of biomedicine's approaches to understanding efficacy have argued that efficacy is embedded in culturally specific expectations of the healing process, and that it has biological and behavioral dimensions, both of which are equally important (cf. Nichter 1992; Whyte et al. 2002). Further, Waldram (2000) asserts that efficacy must be seen as fluid and shifting; as its evaluation can only be properly undertaken by combining all the perspectives of the actors in the sickness episode.

Medical anthropologists examining the cultural meanings of efficacy have particularly emphasized the need to acknowledge the emic ('insider') versus etic ('outside') criteria that determine efficacy (cf. Etkin 1988, 1992; Waldram 2000). The ethnographer's task is to document and bring into sharp relief the 'emic' perspective, and to compare and contrast it with the 'etic' perspective, which is typically the biomedical perspective. The ethnographer seeks to emphasize the fluidity in emic modes of conceptualizing efficacy, and underscores the points of tension that exist between emic and etic perspectives. An emic perspective often provides clues as to why adherence to a particular medicine or therapy is low, or why people in a particular community consume certain medications either in sub-therapeutic doses or in overdoses, or why they prefer to consume one medicine over the other during an illness episode. Due to its very definition, the meanings of efficacy remain fluid and contingent on cultural context. Consequently, medical anthropologists continue to struggle over how best to study and understand efficacy, especially in cross-cultural contexts.

Side effects

In biomedical discourse, the term 'side effect' usually connotes an undesirable effect. It refers to pharmacologic results that are unrelated to the therapy's primary objective (Etkin 1992, 100). However, medical anthropologists who have focused their research on side effects, particularly those related to western pharmaceuticals, have demonstrated that the identification and evaluation of pharmacotherapeutic side effects is unconsciously mediated by social and cultural constructs (Bledsoe and Goubaud 1988). In distinguishing primary and secondary effects of pharmaceuticals, Etkin (1992) has shown how the interpretation of side effects influences the selection and use of pharmaceuticals as they are rendered through local paradigms of physiology, nosology and therapeutics (Etkin 1992, 99). Etkin also notes that, in many contexts, a side effect is taken either as a sign to discontinue treatment, or at

least to interrupt the therapy, or as an indication that the drug is working and the illness is on its way out.

Determining the efficacy and side effects related to antimalarials is a complex task, both in biomedical and behavioral terms. This is especially true when the patients are primarily young children, and the mothers do the reporting on behalf of their children. As such, this paper examines the subjective, perceived efficacy and side effects of SP as they are articulated by the mothers of young children through illness narratives. This subjective, 'interpretive' approach stands in contrast to 'objective' criteria or indicators such as pill counting, blood drug level tests and assays. Arguably, both 'objective' indicators of efficacy and 'subjective,' discursively rendered indicators of efficacy have their own set of epistemological and methodological constraints. For example, studies have found significant discrepancies between reported consumption of antimalarials, efficacy and detectable levels of the specific antimalarial found in blood samples (cf. Eriksen et al. 2005, 1041; Yeung and White 2005).

Research setting and methods

Data were gathered during five months of fieldwork in Mbande, a multi-ethnic village located on the periphery of the Chamazi Ward of Temeke District, Dar es Salaam. Between 2001 and 2006, Mbande's population increased from 5500 to nearly 8000 people, largely due to in-migration from neighboring towns. Subsistence-oriented farming is the economic base for the majority of the local residents and for most of them cash income is scarce. A small number of the local people commute to the city on *daladala* minibuses or on bicycles, to sell their produce, mainly fruits and vegetables, or in pursuit of wage work. The local health arena is pluralistic as villagers have access to a range of health facilities, including four 'traditional healers' who reside in the village, a municipal dispensary, and six *maduka ya dawa*, which are managed by people who are not well-trained and who sell a range of medicines over-the-counter, including antimalarials and antibiotics.

Data were gathered using different methods including focus group discussions (FGDs), semi-structured interviews, and a collection of life histories and illness narratives elicited from mothers of children under the age of five, who were recently treated for malaria. All the interviews were conducted in Kiswahili with the help of a research assistant. As a first step, FGDs were conducted with three groups of six mothers of young children who were recently treated for malaria. These FGDs provided a platform to pre-test the key questions and to gain contextual insights into the cultural understandings of efficacy and the side effects of the existing antimalarials. After processing the data from the FGDs, detailed ethnographic interviews were conducted with 56 mothers who were randomly recruited from the community over a two-month period. These mothers had a child who was treated for malaria less than two weeks before the interview. Illness narratives were elicited regarding the child who was most recently diagnosed with malaria and treated with SP. In many cases, these children were also treated with other antimalarials such as amodiaquine (AQ), quinine (QN) and antibiotics during the course of the illness, making it difficult to decipher SP-only related perceptions of efficacy and side effects. Mothers were asked questions such as: How long did you wait before taking your child to a health facility? How long did you wait before trying out an alternative

source of treatment for your child? Did your child experience any undesirable bodily side effects (*madhara*) after being treated with SP, and if so what were the side effects? How do you compare your experience with SP in relation to CQ?

All the mothers who agreed to participate in the study gave their oral consent for the interview. The in-depth interviews, which lasted between 40 and 50 minutes, were recorded on a digital audio-recorder, transcribed verbatim in Kiswahili by two research assistants, and later translated into English by a third research assistant who was fluent in both Kiswahili and English. The recorded ethnographic interviews were processed using Microsoft Excel and Word to do a close discourse analysis that can be best accomplished from audio-recorded discourse. Notes from the field diary were elaborated upon and incorporated into the analysis.

Background information on mothers

The average age of the mothers interviewed for this study was 26.5 (range 18–42). Seventy-one percent were married, 9% were single, unmarried; 5.3% were widows; 3.5% were divorced; and the remaining 10.7% were not married but living with their fiancé (*mchumba*). Fourty-three percent of the mothers had at least two children; 25% had one child, and the remaining 32% had three or more children. The average number of children was 2.29 (range 1–5). In terms of their religious affiliation, 87.5% were Muslims and the remaining 12.5% were Christians. As for their ethnic identity (*kabila*), 27% said that they were Zaramo, 12.5% identified themselves as Matumbi; 10.7% as Ndengereko; and 3.6% each as Makonde; Mpogoro; Msukuma; and Mzigua. The remaining 46% said that they were Nyamwezi, Luguru, Mwera, Mbondei, Gogo, Myao or Mkulya. The majority (74%) of the mothers either had only two or three years of formal education or they were mostly not literate. The remaining 26% of the mothers had completed seven years of primary school.

The children were in the age range of nine months to five years. The majority of them were in the four to five years age group. An equal number of children were male and female. Seventy-five percent of them had a sibling. Many of the mothers were dealing with the sickness of their first child, except in cases where an older sibling may have died.

Waiting period and therapy seeking

How long do mothers wait before they recognize that their child has a fever and needs to be taken to a health facility? Addressing this question is important in light of WHO's repeated emphasis on early detection and prompt treatment with an effective antimalarial. Thirty percent of the mothers had waited for three days before taking their febrile child to a biomedical health facility, 21% had waited for two days, and another 9% had waited for two to three days. Significantly, 12.5% of them had waited for one full week, and another 9% had waited for two full weeks. During the waiting period, more than 2/3 of the mothers had given their child a store-bought antipyretic. In many cases, they had also sponged their febrile child to bring down the fever. Only 11% of them had taken their child to the dispensary on the same day they had noticed that their child had a high fever. Ninety-six percent of the mothers had tried to deal with their child's fever with Panadol, and none of them had given their child a store-bought antimalarial. They mentioned that SP was 'too strong' a

medication for them to give to their child on their own, without consulting a doctor. This observation is consistent with the findings of other researchers in Tanzania who have reported that in comparison with earlier reports of high levels of self-treatment with CQ, because of ease of access and its antipyretic properties, home treatment with SP is relatively uncommon especially in the case of children (see Kachur et al. 2004).

Thirty-two percent of the mothers were not satisfied with the treatment that their child had received at the first place of medical consultation. In these cases, the child's fever had persisted despite the fact that the child was treated with SP. Thirty-six percent of the mothers had waited for three days before returning to a health facility for further consultation or treatment. Eighteen percent had waited for only two days, and 11% had decided to seek help from a different source on the same day that they had sought help from the dispensary. While 9% of them said 'two to three days,' another 9% said that they had waited for four days because the fever had not yet fully subsided. Finally, while 14% mothers had waited for a week, another 7% stated that they had waited for two weeks or more before deciding to take their child to a different health facility. Mama Salum, a 30-year-old mother of two children, explained:

> My one-and-half year old son was sick for two weeks before I decided to take him to the dispensary. I kept sponging him and giving him Panadol. Finally, when I took him to the dispensary, the doctor said 'its malaria' and wrote a prescription for SP syrup. He did not do any blood test. Even after three days, the fever did not come down. I took him again to the dispensary. The nurse there told me to continue giving him Panadol. But my child's fever did not go away, so I took him one more time to the dispensary and they advised me to go to a hospital in Mbagala town. So I took him to a private hospital where he was given an injection. Now my child is feeling a little better.

Bearing in mind the frequency with which mothers experience disappointing results from their encounters at public health facilities, it is not uncommon for mothers like Mama Salum to hesitate to take their febrile children to the municipal dispensary during subsequent fever episodes. This hesitation is often prompted by the fact that blood tests or medical tests are not conducted at the dispensary. In addition, febrile children are typically prescribed SP, even as reports of over-diagnosis of malaria, drug resistance and treatment failures are on the rise. Repeated contacts with the municipal dispensary for the same illness episode resulted in yet another prescription for SP. As with Mama Salum, 59% of the mothers had consulted more than one health facility in search of an alternative therapy for their sick child. Regarding the initial illness episode narrated during the interview, 41% of the mothers had sought help only from the local municipal dispensary. At least half of the mothers, however, reported that they were dissatisfied with the initial prescription because their child's febrile condition did not improve. They returned to the dispensary for further consultation on at least two occasions to follow-up on the same illness episode. While 14% had first sought help from the municipal dispensary, during their second resort they had sought treatment at a mission hospital located 15 miles away from Mbande. Five percent of those who had first sought help from the municipal dispensary decided to go to the Temeke district hospital, located 20 miles away, as a second resort. One of the mothers had taken her sick child directly to a mission hospital, and two others had taken their child to municipal hospitals located in the neighboring municipal districts of DSM. Only five percent had taken their child to another hospital directly, which included district and private hospitals and clinics.

Ultimately, in the search of therapy for their child's illness, the majority of the mothers sought help from a health facility that was far away from their home village. In the process, they incurred additional expenses and lost precious time.

Perceived efficacy of CQ and SP

The majority of the mothers who participated in the FGDs and those who were interviewed in detail were nostalgic when talking about CQ. They repeatedly stated '*bora tuletwe Chloroquine!*' – that they would be very pleased if CQ was brought back into their lives. They yearned for the time when they had ready access to CQ that was inexpensive and brought immediate relief to the patient because of its antipyretic effect. Mothers spoke of how easily they could buy CQ over-the-counter from one of the local pharmacies, and also store it conveniently at home for future use. They also emphasized that compared to CQ, SP was not an efficacious drug. Adherence to a CQ prescription was attractive because CQ was available in various presentations: tablets, syrup and injections. From a cultural perspective, the nostalgia associated with CQ reflects the desire on part of the mothers to revert to a medication that is trusted and to an era when people had access to an antimalarial that was cheap and accessible. Mothers spoke about CQ in nostalgic terms despite the drug's faltering clinical efficacy, especially in relation to SP, a clinically more efficacious drug. As medical anthropologists have emphasized, once a drug has been used for many years and it is trusted, perceptions of efficacy remain strong, even in the face of declining biological efficacy (van der Geest et al. 1990).

In addition to finding SP more expensive than CQ when purchased from private pharmacies, mothers also believed that it was a 'dangerous' drug. They frequently used phrases such as *hatari sana* (it is dangerous), *inasumbua sana* (it troubles a lot), *inachokesha sana* (it tires you a lot), *tunaogopa dawa hii* (we are afraid of this medicine), *inaua kabisa* (it kills, absolutely), and *watu wanapoteza maisha* (people lose their lives) to underscore their sentiments about SP as an undesirable drug because of its serious, adverse side effects, which are even more pronounced for children suffering from malaria. All mothers emphatically stated that they knew or had heard of someone who had died after being treated for malaria with SP. However, most of them accepted SP to treat their children because they did not have an alternative. In these circumstances, people were keen on the government to replace SP with new antimalarials that were as effective, inexpensive, and readily available as CQ when it was the first-line antimalarial.

Not one respondent or key informant had heard of any of the artemether-based antimalarials, let alone having tried any of the 30 or more 'new' antimalarials that were being sold over-the-counter at the time in the numerous *maduka ya dawa* in Dar es Salaam (Kachur et al. 2006). Thus, even though there is an abundance of drug options available on the retail market, popular discourse surrounding antimalarials commonly prescribed at public health facilities remain the dominant framework for community-level judging and evaluation of the efficacy of antimalarials. The perceived efficacy of antimalarials is often dependent on several factors, including the community 'awareness,' the prescribed top-down drug policy, shifts in national policy on recommended antimalarials, and the complex configuration of the local medicine market.

Brand-name confusion and perceived efficacy

Mothers commonly believed that the different brand names of SP (e.g. Fansidar, Orodhar, Metakelfin) were in fact different antimalarials. In pharmacological terms, these brands were similar because they contained the same active ingredient. Local understandings, however, suggest that one brand name of SP is perceived to be 'better' than another. For example, Mwajuma, a 37-year-old widow with four children, had this to say:

> I took my two year old son first to the dispensary. There the doctor gave him SP, but his fever did not go away. After waiting for three days, I took him again to the dispensary. The doctor said that the medicine was working inside the body and that I should give my child only Panadol to bring down the fever. I waited for another three days, but the fever did not go away. Then I bought Fansidar from one of the local pharmacies. Even that did not help, so I bought Metakelfin from another pharmacy. Even that did not work. Finally, I took my child to the Mission Hospital [15 miles away] where he was treated with quinine injections. Now he is a little better.

Mwajuma's pattern of therapy seeking for her child calls attention to the fact that mothers who are not well informed may not realize that by treating their child with different brands of the same antimalarial, they are in fact over-dosing their child.

Perceptions regarding the drug's efficacy were also embedded in the mothers' statements regarding whether their child had recovered or not from his or her illness. Two-thirds of the mothers stated that their child had either recovered completely from the illness, or that they were satisfied with their child's health condition. These mothers considered the absence of fever as the most important marker of their child's recovery from the illness. However, 30% said that their child was still sick and two of the mothers were unsure if their child had recovered from the illness. Significantly, out of the 37 mothers who stated that their child had recovered from his or her illness, more than half of them *did not* attribute their child's recovery to SP, but to another antimalarial such as AQ or, more commonly, QN which they had obtained from the second or the third source of treatment. The perceived efficacy and privileging of the second source of treatment illustrates that what is 'biomedically' regarded as the best first line drug may not be consistent with the cultural construction of the antimalarials that people consider efficacious. It also points to the methodological difficulties encountered in documenting the perceived efficacy of a particular antimalarial when the patient has been treated with a cocktail of antimalarials and antibiotics.

To elicit their perceptions of the 'curative' efficacy of SP, mothers were asked: Je, unafikiri dawa ya SP inafanya kazi sawasawa katika kutibu malaria? ('Do you think SP works or does not work in the treatment of malaria?'). Seventy percent of the mothers said that SP was not a good medicine, either because it was too strong and/or too slow-acting. An analysis of the discourse surrounding the efficacy of SP revealed that mothers most frequently used phrases such as *haziponyeshi* (it does not cure), *homa haishuki* (the fever does not come down), *homa iko pale pale* (the fever does not go away, it remains there), *nguvu inashuka* (literally, the child loses strength or the strength comes down), *haifanyi kazi* (no it doesn't work), and *inazidisha homa* (it worsens the fever). Only 16% believed that SP was an effective drug. Although another 20% said that SP was an effective drug, they were quick to elaborate on their statement with qualifiers such as 'yes it works but it takes at least a full week for the fever to come down,' and 'yes it works, but children have to suffer a lot before their

fever goes away.' Only two of the mothers said that they were unsure if SP was an effective medication. In general, mothers did not look upon the drug favorably.

Side effects of SP

Focusing specifically on the subject of *madhara*, mothers were asked if they had witnessed any adverse reactions to SP. Twenty-three percent of the mothers said that they were not aware of any particular side effect that they could associate with SP; 43% stated that the worsening and persistence of fever was one of the primary undesirable side effects of SP. They spoke of *madhara* by using phrases such as *mwili unachemka sana* (body becomes very hot), *inazidisha homa* (it worsens the fever), and *inapandisha homa* (it spikes the fever). They elaborated on how the fever spikes immediately after the child has swallowed half a tablet of SP (*haishushi homa chap chap*, *homa inapanda juu*) or for that matter, the fever does not go away for nearly a week (*homa inarudi*; *homa haishuki*; *homa iko pale pale*). Similarly, 20% of the mothers said that one of SP's *madhara* was that the child becomes extremely tired and lifeless (*hana nguvu*; *alichoka sana*). The remaining 14% of mothers articulated the perceived *madhara* as follows: *alilia sana* (the child was crying incessantly); *mwili wote unavimba vimba* (the entire body was full of boils); *alianza kuharisha* (the child had diarrhea); *alilegea legea sana* (the child was lethargic); *alianza kuumuka* (the child was feeble); *ana kuwa mnyonge mnyonge* (the child became very weak and unsteady); *alianza kuwashwa washwa* (the child started itching all over the body), and *alipata vipele na vidonda mdomoni* (the child had sores around the mouth). Constrained by their limited choice with antimalarials, mothers rationalized that the side effects of SP are an indication that the illness is leaving the body; and that the drug makes the illness worse before it gets better.

Discussion

At a time when the literature on drug resistance and the clinical efficacy of various antimalarials is growing, the relative inattention to social and cultural aspects of efficacy and effectiveness of antimalarials is a cause for serious concern. As Durrheim and Williams (2005, 178) note, even as major policy advances are being made in the deployment of 'new' antimalarials, 'delivery of effective malaria treatment will not occur unless attention is also focused on the broader, socio-cultural, economic, technical and political environments in which it is implemented.' Clearly, it is one thing to demonstrate the *in vivo* clinical or pharmacological efficacy of various antimalarials in controlled environments, and quite another thing to ensure the effectiveness of the drugs in 'real-life' situations (Amin et al. 2004). Generally excellent efficacy observed under controlled clinical trial conditions will not be realized as 'effectiveness' when they are deployed widely under real-life conditions (Yeung and White 2005, 121).

While the Tanzanian government's decision to deploy artemether-lumefantrine (Coartem) as the first-line antimalarial is laudable from a humanistic and pragmatic point of view, it calls for the wider acknowledgement of how communities that are severely affected by malaria interpret the efficacy and side effects of antimalarials. There is a need to know how the introduction of new antimalarials affect people's treatment expectations, the cultural meanings they attribute to old and new drugs,

their reckoning of the cost factor in their search for therapy, and their responses to uncertainty in the context of poverty. Given the wide range of brand-name antimalarials available on the retail market, including numerous artemisinin-derivatives sold as monotherapies, the large-scale deployment of artemisinin-based antimalarials is likely to create more cause for confusion and inappropriate consumption of antimalarials among the public. The proliferation of antimalarials marketed under a plethora of brand names, and in various combinations, presents many poor people with the 'burden of knowing' and the 'burden of choice.' People may find it difficult to recognize the various brand names, and not everyone may be 'discriminating' when it comes to buying antimalarials from the *maduka ya dawa* to deal with malarial episodes. Thus, the rapid expansion of the private health sector witnessed during the last few years warrants further exploration of how the new malaria treatment guidelines have affected the patterns of distribution and consumption of antimalarials among different strata of a population.

For mothers in communities like Mbande, dealing with a single episode of childhood malaria is usually an expensive undertaking. In most cases they have to seek treatment from more than one health facility for a single episode of malaria. In the present context, the cultural constructions and perceived inefficacy of locally-dispensed SP illustrates that the financial burden increases exponentially for mothers of febrile children. This financial burden is all the more heavy on mothers who are single, and who lack a strong support network to help them out during a health crisis. Disappointed with the quality of locally available health care, many mothers engage in patterns of therapy seeking that become further removed and spatially distant from their original locale, and ultimately very expensive.

Without adequate testing services, many mothers in places like Mbande will continue to delay bringing their sick children to the health facilities, believing that, as in the case of SP, their children will not be tested and they will be given the 'same useless medication' (*dawa zile zile*) (see also Comoro et al. 2003). In order to obtain a cure, many poor people in due course will turn to private pharmacies and purchase antimalarials that are less expensive, but of questionable clinical efficacy. Others will seek consultations at private health facilities and spend their precious time and resources in dealing with an illness that should ideally be treated locally, free-of-cost or at affordable cost. These drawn-out negotiations will in turn lead to endless cycles of children developing high fevers and mothers becoming increasingly frustrated with inefficacious treatment. The problem is also complicated by the fact that many private pharmacies in Tanzania are managed by unqualified or poorly-trained personnel. There is also the risk that patients will consume their medications in inappropriate dosages and combinations and thus compromise the clinical efficacy of the drugs. Carefully planned, community-based health interventions that address local understandings of illness and therapy seeking will go a long way in enabling the poor to mitigate their experience with high levels of malaria-related morbidities and mortalities. Health planners must consider community beliefs and practices when developing and implementing new drug policies, as communities must be reasonably convinced of the advantages of the 'new drug policy' before they will accept it. Frequent policy change is likely to lead to confusion among the public and a loss of credibility of the policy makers at the local level (Yeung et al. 2004, 182).

In conclusion, ethnographic studies of cultural perceptions of malaria or antimalarials can provide useful perspectives on how people negotiate the identity of an illness, and how they understand malaria as an illness. It is important to address lay people's talk about treatment decisions, alternative courses of possible action, and interpret the efficacy and side effects of antimalarials that are deployed as first-line drugs, and their treatment expectations and perceptions of medicine compatibility. Ethnographically-grounded research can provide a social 'corrective' in the overly technical and biomedically driven health policies and interventions that have come to dominate the global malaria control discourse and practice. The central role socioeconomic and cultural factors play in how illnesses and medicines are interpreted and utilized within households and outside the formal health sector must be considered. The potential for anthropological studies in malaria can best be harnessed in planning and implementing community-based health programs, where knowledge of local illness-related cultural beliefs and practices can go a long way in improving the rigor of health interventions (cf. Helitzer-Allen et al. 1993; Kamat 2009). Ethnographic research can highlight intra-cultural variability in perceptions of malaria in general and caution health policy makers against implementing the 'one drug fits all' approach to malaria control.

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References

Amin, A.A., D.A. Hughes, V. Marsh, T.O. Abuya, G.O. Kokwaro, P.A. Winstanley, S.A. Ochola, and R.W. Snow. 2004. The difference between effectiveness and efficacy of antimalarial drugs in Kenya. *Tropical Medicine & International Health* 9, no. 9: 967–74.

Barnes, L. 2004. American acupuncture and efficacy: Meanings and their points of insertion. *Medical Anthropology Quarterly* 19, no. 3: 239–66.

Bledsoe, C., and M. Goubaud. 1988. The interpretation and distribution of western pharmaceuticals: An example from the Mende of Sierra Leone. In *The Context of Medicines in Developing Countries: Studies in Pharmaceutical Anthropology*, eds. Sjaak van der Geest and Susan Reynolds Whyte, 253–76. Amsterdam: Het Spinhuis Publishers.

Bosman, A., and K.N. Mendis. 2007. A major transition in malaria treatment: The adoption and deployment of artemisinin-based combination therapies. *American Journal of Public Health* 77, no. Suppl. 6: 193–7.

Comoro, C., S. Nsimba, M. Warsame, and G. Tomson. 2003. Local understanding, perceptions and reported practices of mothers/guardians and health workers on childhood malaria in a Tanzanian district-implications for malaria control. *Acta Tropica* 87: 305–13.

Durrheim, D.N., and H.A. Williams. 2005. Assuring effective malaria treatment in Africa: Drug efficacy is necessary but not sufficient. *Journal of Epidemiology and Community Health* 59: 178–9.

Eriksen, J., S.E.D. Nsimba, O.M.S. Minzi, A.J. Sanga, M. Petzold, L.L. Gustafsson, M.Y. Warsame, and G. Thomson. 2005. Adoption of the new antimalarial drug policy in Tanzania – a cross-sectional study in the community. *Tropical Medicine & International Health* 10, no. 10: 1038–46.

Etkin, N.L. 1988. Cultural constructions of efficacy. In *The Context of Medicines in Developing Countries*, eds. Sjaak van der Geest and Susan Reynolds Whyte, 299–326. Holland: Kluwer Publishers.

Etkin, N.L. 1992. 'Side effects': Cultural constructions and reinterpretations of Western pharmaceuticals. *Medical Anthropology Quarterly* 6, no. 2: 99–113.

Helitzer-Allen, D.L., C. Kendall, and J.J. Wirima. 1993. The role of ethnographic research in malaria control: An example from Malawi. *Research in the Sociology of Health Care* 10: 269–86.

Kachur, P., R.A. Khatib, E. Kaizer, S.S. Fox, S.A.M. Abdulla, and P.B. Bloland. 2004. Adherence to antimalarial combination therapy with sulfadoxine-pyrimethamine and artesunate in rural Tanzania. *American Journal of Tropical Medicine & Hygiene* 71, no. 6: 715–22.

Kachur, P., C. Black, S. Abdulla, and C. Goodman. 2006. Putting the genie back in the bottle? Availability and presentation of oral artemisinin compounds at retail pharmacies in urban Dar-es-Salaam. *Malaria Journal* 5, no. 1: 25.

Kamat, V.R. 2009. Anthropology of childhood malaria in Tanzania. In *Anthropology in Public Health. Bridging Differences in Culture and Society*. 2nd ed., eds. Robert Hahn and Marcia Inhorn, 3–32. New York: Oxford University Press.

Mubyazi, G., and M. Gonzalez-Block. 2005. Research influence on antimalarial drug policy change in Tanzania: Case study of replacing chloroquine with sulfadoxine-pyrimethamine as the first-line drug. *Malaria Journal* 4, no. 1: 51–63.

Mutabingwa, T.K. 2005. Artemisinin-based combination therapies (ACTs): Best hope for malaria treatment but inaccessible to the needy! *Acta Tropica* 95, no. 3: 305–15.

Nichter, M. 1992. Ethnomedicine: Diverse trends, common linkages. In *Anthropological Approaches to the Study of Ethnomedicine*, ed. Mark Nichter, 223–59. Amsterdam: Gordon and Breach Science Publishers.

Nsimba, S.E.D. 2006. How sulfadoxine-pyrimethamine (SP) was perceived in some rural communities after phasing out chloroquine (CQ) as a first-line drug for uncomplicated malaria in Tanzania: Lessons to learn towards moving from monotherapy to fixed combination therapy. *Journal of Ethnobiology & Ethnomedicine* 2, no. 5: 1–8.

Snow, R.W., J. Trape, and K. Marsh. 2001. The past, present and future of childhood malaria mortality in Africa. *Trends in Parasitology* 17, no. 12: 593–7.

Tarimo, D.S., J.N. Minjas, and I.C. Bygbjerg. 2001. Perception of chloroquine efficacy and alternative treatments for uncomplicated malaria in children in a holoendemic area of Tanzania: Implications for the change of treatment policy. *Tropical Medicine and International Health* 6, no. 12: 992–7.

van der Geest, S., A. Hardon, and S.R. Whyte. 1990. Planning for essential drugs: Are we missing the cultural dimension? *Health Policy and Planning* 5, no. 2: 182–5.

Waldram, J.B. 2000. The efficacy of traditional medicine: Current theoretical and methodological issues. *Medical Anthropology Quarterly* 14, no. 4: 603–25.

Whyte, S.R., S. van der Geest, & A. Hardon, eds. 2002. *Social Lives of Medicines*. Cambridge, UK, New York: Cambridge University Press.

Williams, H.A., D. Durrheim, and R. Shretta. 2004. The process of changing national malaria treatment policy: Lessons from country-level studies. *Health Policy and Planning* 19, no. 6: 356–70.

Yeung, S., and N.J. White. 2005. How do patients use antimalarial drugs? A review of the evidence. *Tropical Medicine & International Health* 10, no. 2: 121–38.

Yeung, S., W.P. Vornpinyo, I.M. Hastings, A. Mills, and N.J. White. 2004. Antimalarial drug resistance, artemisinin-based combination therapy, and the contribution of modeling to elucidating policy choices. *American Journal of Tropical Medicine and Hygiene* 71, no. Supplement 2: 179–86.