

REACT Cameroon

Summary of qualitative situation analysis results

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August 2010

Recommended citation: Chandler, CIR; Reynolds JL; Mangham-Jefferies, L; Njei, AN; Achonduh, O; Mbacham, WF; Wiseman, V (2010). REACT Cameroon: Summary of qualitative situation analysis. Report prepared for the ACT Consortium, which is funded through a grant from the Bill & Melinda Gates Foundation to the London School of Hygiene and Tropical Medicine.

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1 Background

The challenge of malaria case management in sub-Saharan Africa continues to place considerable burden on populations through associated morbidity and mortality, and on fragile health services. More effective treatments for malaria in the form of artemisinin-based combination therapies (ACTs) have been introduced in recent years as first-line treatments across malaria-endemic countries. However, overdiagnosis and misdiagnosis of malaria, and unnecessary prescription of ACTs (and other antimalarials) continue to be problems in these countries (Whitty et al., 2008). As a result, alternative causes of disease in febrile patients can be overlooked, the cost-effectiveness of ACTs is undermined, and the risk of drug resistance is increased (Lubell et al., 2007; World Health Organization, 2011). The revision of World Health Organization (WHO) guidance for treating malaria to recommending the restriction of ACTs to parasitologically-confirmed cases of malaria only, where testing facilities exist (World Health Organization, 2010), reflects a move to improve address these issues.

Rapid diagnostic tests for malaria (RDTs) are increasingly promoted as valuable technologies to improve the quality and availability of diagnostic testing of malaria, and thus of malaria case management, in low-resource settings where microscopy may be lacking or of poor quality (Kyabayinze et al., 2010). However, there is evidence from multiple settings that the potential effectiveness of RDTs in guiding appropriate treatment of febrile illness is limited by ongoing symptomatic diagnosis, and health workers continuing to prescribe antimalarials even when faced with negative test results for malaria (E.K Ansah et al., 2010; Reyburn et al., 2007). Various interventions have been trialled and evaluated in malaria-endemic countries designed to improve health workers' practice in relation to the use of malaria diagnostics, with mixed results, reflecting different types of supporting interventions beyond standard training on use of RDTs (C Chandler et al., 2010; D'Acremont et al., 2011; Masanja et al., 2012; Skarbinski et al., 2009).

In Cameroon, West Africa, where malaria accounts for 35-40% of all deaths and 50% of morbidity among children under five, there has been recent interest by the Government to introduce RDTs to public health facilities, alongside the current, widespread availability of microscopy in both public and private facilities (Ministry of Public Health of the Republic of Cameroon, 2009). Against this backdrop, there is evidence of the need for malaria case management across different types of health facility in Cameroon to be improved, as numbers of febrile patients being tested for malaria are low, and a high proportion of those receiving antimalarials following symptomatic diagnosis do not have malaria (Mangham et al., 2012). In recognition of this, an evaluation of two provider training packages alongside the introduction of RDTs in two areas of Cameroon has been rolled out, to assess the effectiveness and cost-effectiveness of supportive interventions to improve targeting of antimalarial treatment and health workers' use of malaria treatment guidelines (Wiseman et al., 2012).

In addition to health workers' conceptualisations and understanding of malaria, diagnostic testing and recommended treatments, the role of patients in the process and outcomes of the clinical encounter must be acknowledged. Health workers' perceptions of what they think their patients

expect from a clinical encounter, in terms of diagnosis and treatment, may influence whether tests are conducted, and subsequent prescribing behaviours (Asiimwe et al., 2012; CI Chandler et al., 2008; C Chandler et al., 2012; C Chandler et al., 2010; Harvey et al., 2008; Reynolds et al., 2013). Acknowledging the complexity of the interactions between health worker and patient, and the potential influence of patients on the consultation and outcome (Greer et al., 2002), it is important to consider community understandings of malaria, diagnosis and treatment, and the potential impact of these on the appropriate management of malaria.

Community understandings and experiences of malaria have been explored in multiple settings in sub-Saharan Africa, frequently highlighting the multiplicity of interpretations of the term 'malaria' and how a biomedical definition of the disease can be tempered by local, culturally-specific conceptualisations of the body and health (see for example Hausmann Muela et al., 2002; Vinay R. Kamat, 2008; Holly Ann Williams & Jones, 2004). These interpretations shape prevention and care-seeking practices for malaria, and also perceptions of the effectiveness of different treatments for malaria (Granado et al., 2011; Vinay R. Kamat, 2009; V. R. Kamat & Nyato, 2010; Maslove et al., 2009). Yet, there is a dearth of research on community perceptions of malaria and its diagnosis, including treatment, in Cameroon. One study identified the gap between community members' knowledge of malaria and biomedical guidelines for its treatment (Nsagha et al., 2011). However, it is important to consider how community members conceptualise malaria from a more emic perspective (H. A. Williams et al., 1999), and how these conceptualisations intersect existing health care provision to shape treatment-seeking practices, and interpretations of care.

In this work, we adopt a meaning-based, interpretive approach to understanding malaria in practice, well established in the field of medical anthropology (Nichter, 2008). We see 'malaria' as a term with multiple meanings, held by and communicated between health workers and their patients as well as other communities of stakeholders across educational, economic and geographic boundaries (Beisel, 2010). We conceive that constructions such as 'malaria' become apparent as such diseases are 'enacted' or practiced, following Mol (2002) who presented an ethnography or 'praxiography' of arteriosclerosis as a disease, showing how medical technologies, arteries, doctors and patients enact different versions of the disease through coordination, interference and contradiction in medical practices.

For the health worker perspective, we have problematised the enactment of malaria by health workers through analysis of the roles of different processes and paraphernalia. To do this, we draw on long-standing work on symbolism in medical practice (A. Kleinman, 1973) and the role of tangibles such as medicines that can facilitate communication about experiences that may be difficult to express (Van der Geest & Whyte, 1989). In the case of artefacts involved in diagnostic procedures, we are sentient to the arguments of the 'technological imperative' of medicine as practiced in Northern societies (Koenig, 1988), with diagnostic technologies representing reductionist notions of health as localised and identifiable within the body, privileged over clinical information gathered from listening, looking and feeling patients, as 'paraclinical' information (Feinstein, 1975). We view the introduction of new guidelines and technologies for diagnosing 'malaria' that have emerged from outside of Cameroon through the analytical lens of evidence based medicine (EBM) as a social movement, following Pope (2003). Emerging within the medical profession in Northern countries, EBM has been observed to have shifted notions of 'evidence' from

clinical reason, based on experience of what worked, and rooted in pathophysiology together with social and cultural knowledge of the individual patient, to probabilistic rationality based on the results of clinical trials (Armstrong, 2002; Mykhalovskiy & Weir, 2004).

For our interpretation of community perspectives, we draw on established medical anthropological theories of ‘explanatory models’ of illness (see for example A Kleinman, 1980), wherein episodes of sickness are interpreted and understood idiosyncratically, and often individually, and multiple, intersecting explanatory models can exist for the same sickness episode, among those connected to it (Pool & Geissler, 2005). This theoretical perspective is underpinned by a set of assumptions that how people make sense of illness episodes reflects a complex amalgam of social, cultural and experiential realities (Good et al., 2010), and which can in turn influence future treatment-seeking practices, for example for malaria. Guided by this approach, we conducted a qualitative study to explore community men, women and primary caregivers’ conceptualisations of malaria as a diagnosis and its treatment in Cameroon, to understand influences on current prescribing behaviour, and to inform interventions to improve health workers’ malaria case management.

2 Overall Objective

- To gain an understanding of influences on current prescribing behaviour in order to design interventions to reduce overuse of antimalarials and increase appropriate use of ACTs

3 Aims

- To understand the reasons for provider overuse of antimalarials
- To understand the reasons for provider underuse of ACTs amongst antimalarials
- To identify channels of communication that may be effective in intervening with providers

4 Methods

4.1 Study context

This qualitative study was carried out in two areas of Cameroon; Bamenda in the Northwest region, and Yaoundé in the Central region, and in both regions, malaria is endemic. Bamenda is situated in an area of volcanic highlands, and inhabitants speak mostly English and Pidgin English. In contrast, Yaoundé is the capital city of Cameroon and the second largest city in the country, with close to 1.5 million inhabitants, and is predominantly Francophone. The two areas were selected in the design of the broader intervention study to represent both the Anglo- and Francophone areas in which the trial of the interventions to improve practice of treating malaria would be conducted.

The health system in both Bamenda and Yaoundé comprises a mixture of public and private health facilities. These include public district hospitals and primary health centres, mission hospitals and health centres, and private medicine retailers including pharmacies and drug-sellers; although the latter are most commonly found in the Northwest region (Hughes et al., 2012). Many public and private facilities have laboratory services, including microscopy for the diagnosis of malaria.

However, the provision of these services can be limited by lack of resources and trained staff. Private pharmacies and drug-sellers are not licensed to conduct consultations with patients or malaria testing (Mangham et al., 2012).

4.2 Study design

A qualitative study was designed as part of formative research feeding into the development of two interventions to improve health workers' malaria case management, to be evaluated through a clusters randomized controlled trial (Wiseman et al., 2012). The study used focus group discussions (FGDs) with community members (adult men, women and primary caregivers) and with health workers from public, mission and private facilities in both the Bamenda and Yaoundé sites, to understand influences on current prescribing behaviours in relation to malaria.

4.3 Study sample

Health workers. Potential recipients for future introduction of malaria RDTs at health facilities were invited to participate in the FGDs. All health workers who had a role of prescribing or dispensing and administering medicines at public or mission health facilities in the study areas were therefore eligible. We separated the participants into different cadres of medical doctors or nurses/midwives/nurse assistants in order to foster more openness amongst participants. We identified potential participants from an earlier census survey of health facilities in the two study areas and from lists provided by the person in charge of the health facilities. We aimed for 8-12 participants per FGD, and if there were too few eligible to participate from one health facility, we grouped together participants from neighbouring health facilities. Health workers were invited to attend the FGD in a meeting area that was convenient for participants and provided a private space to discuss. No incentives were provided, other than transport refund for those health workers travelling to attend the discussion.

Community members. To capture a range of perceptions of malaria, its diagnosis and expectations from treatment-seeking, from both a personal perspective and from the perspective of caring for children with fever, the sampling strategy for FGDs was selected to reflect the demographic groups of community members who attend health facilities most frequently, according to a formative survey (Mangham et al., 2012). The sample sub-groups were adult men, adult women and primary caregivers (defined as women caring for children under five years). One FGD was carried out in each 14 districts included in Bamenda (8) and Yaoundé (6). See Tables 1 and 2 for a breakdown of the FGDs by sub-groups and district.

A total of 31 focus group discussions were held, 15 in Yaounde and 16 in Bamenda.

Table 1. Number of health worker participants in FGDs

	Medical Doctors		Nurses/Midwives /Nursing Assistants		Total
	Public	Mission	Public	Mission	
Bamenda	1	1	4	2	8
Yaoundé	2	1	3	3	9
					17

Table 2. Number of community member participants in FGDs

	Adult women	Adult men	Primary care givers	Total
Bamenda	2	3	3	8
Yaoundé	2	2	2	6
				14

5 Analysis

Audio recordings were transcribed by members of the field team, and subsequently translated into English through a meaning-based approach. Transcripts and translations were cross-checked and finalised by the field team coordinator.

Translated transcripts and summary notes from each FGD were imported into Nvivo 8(QSR International Pty Ltd, 2009), for coding. Each transcript was read in its entirety before coding line-by-line to identify and label ideas and meanings conveyed in each small section of text. These codes were then grouped and labelled to reflect broader themes. A coding framework was developed from the first few transcripts, into which remaining transcripts were coded. Additions and revisions to the framework were discussed on a regular basis, as higher level constructs were generated, through reviewing emerging themes and interpreting them in relation to relevant literature, theory and the research objectives. Care was taken to explore any differences in coding for FGDs between sample sub-groups or between the two study area.

6 Ethical approval

Ethical approval was obtained from the ethics committees of the London School of Hygiene and Tropical Medicine (No.5429) and Cameroon National Ethics Committee (No 030/CNE/DNM/09). Administrative clearance was obtained from the Ministry of Public Health (No. D30-343/AAR/MINSANTE/SG/DROS/CRC/JA). The trial is registered with clinicaltrials.gov NCT01350752.

7 Results I: Reasons for provider overuse of antimalarials

7.1 Heterogeneous definition of malaria

This broad use of antimalarial drugs went alongside a broad spectrum of definitions of malaria. Many symptoms were associated with malaria (Table 3) and several symptoms aside from fever were voted as the most important in different groups, including aches and fatigue (Table 4).

Table 3. Most commonly reported symptom of malaria: community perspective

Code	Number of FGDs	Number of
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	discussing item	references across all FGDs
Fever, hot body, temperature	14	69
Aching body or head	13	33
Body weakness, tiredness	11	35
Loss of appetite	10	21
Joint pains	9	24
Shivering, feeling cold	9	23
Vomiting	8	16
Changes in the eyes (colour and heat)	7	11
Changes in urine colour	6	7
Stomach pains	5	7
Changes in the mind (hallucinations, talking in sleep)	4	8
Child inactive	4	5
Sleeplessness	3	6
Child cries	3	6
Anaemia	3	4
Dizziness	3	4
Convulsions	3	4

Table 4. Most important symptom of malaria: community perspective

Code	Number of FGDs discussing item	Number of references across all FGDs
Fever, hot body, temperature	11	23
Body weakness, tiredness	8	11
Aching body or head	7	16
Vomiting	6	8
Shivering, feeling cold	5	6
Joint pains	4	6
Bitter taste	3	4
Loss of appetite	3	3

In describing different symptoms, community members referred to different ‘types’ of malaria, for example:

Different malaria for different blood types

‘you know blood, it is not the same. We don’t have the same blood groups so, I know that this bloodgroup A, mostly has it’s own malaria, it manifests its own way. Then one who has group B. So you cannot know that it is only one because if they compare the bloods in the laboratory, we know that this group B always manifests like this, group O always manifests like this [P8 laughing]...so for now, we can take that on and off [F:ehe] yes’. (P10 FGD 206 Bamenda, adult men)

Malaria from drinking beer

‘you might have an uncomplicated malaria or when you take may be three bottles of beers [P6,P10 and P11 laugh] Euh, hmm, you get up, you do have malaria[F :Yes] and it goes away ...

If I drink may be three bottles of beer and that it turns out I have malaria [everyone laughs] I put up with, I put up with it and then sleep very well. I try to take a second bottle of beer [everyone laughs] and that malaria sickness is over and more to that. As regards those medications- Nivaquine, I rarely take those [everyone laughs]' (P1 FGD 400 Yaounde, adult women)

Different malaria from different causes

'I was about to say that malaria that is really, Because when we talk of malaria, we can differentiate malaria. There is malaria that could be typhoid, it is still called malaria. There is malaria that can be caused by mosquitoes, another one results from drinking water. I know that typhoid comes from drinking water. Then, the other malaria comes from mosquitoes and also the dirty environment. Then we can talk of malaria + 1, +2. This shows that we can [have] different malaria'. (P1 FGD 207 Bamenda, adult men)

Different malaria for different people

'Since I am a regular malaria patient every six months, I am obliged to do a test, to reassure myself that I would not fall ill, because my malaria is always ++++' (P10 FGD 404 Yaounde, adult men)

Alongside this array of malaria symptoms, representing different 'types' of malaria, was the concept that malaria is unique to an individual: 'my malaria', which requires 'my treatment'.

7.2 Heterogeneous treatment for malaria

Community members reported a variety of treatments for 'malaria'. Many were biomedicines, some related to the mode of delivery rather than the treatment itself (e.g. drips, injections), some were traditional medicines and others cited food, drink and supplements as treatments for malaria. As with malaria symptoms, malaria treatment is often considered to be different for different people.

Some treatments work for some people but not others

'I could take take chloroquine for malaria and it treats me [F: yes] whereas it will not treat another person. That is my experience'. (P11, FGD 200 Bamenda, primary care givers)

'I would like to say this. I do have children at home who regularly fall ill, but each child has his medication. As such for me, there is no special treatment for uncomplicated malaria. Each person goes with his treatment with his medication [P11 : it's like my treatment]' (P2, FGD 400 Yaounde, adult women)

The best treatment depends on the person's body system

'Well, I would say it depends on everyone's system and the dose of the drug. She, she can be sick and treats herself with two tablets. Another person could be sick and she treats herself with 20 tablets. It all depends in the way the individual gets the sickness. We observe that in certain children, a child, you could actually treat him with para «Paracetamol» whereas he was seriously ill, the temperature was almost at 40°C . Sometimes, you could find another person whom you could treat with Quinine, another whom you treat with Fansidar. Well, just as she had rightly said it varies from person to person'. (P9, FGD 400 Yaounde, adult women)

Treatment depends on what your body is used to

'Like me, I take my Ekok a «plant» as [P7] said. Based on each and every person's body, [short

pause] if someone takes just one tablet of Quinine and he recovers, he is accustomed to that. Another person is accustomed to his tisane, Lemon tisane to which he adds a piece of Quinquelibá «a plant» and he takes it for three months’. (P2, FGD 404 Yaounde, adult men)

7.2.1 Preference for biomedicines

Many respondents stated that specific biomedicines were the best treatment for malaria. Table 5 lists the medicines most preferred by community members for treating ‘their malaria’. This demonstrates the wide spectrum of medicines used, including those no longer recommended.

Table 5. Community perceptions of the best malaria medicine

Code	Number of FGDs discussing item	Number of references across all FGDs
Quinine	12	32
Coartem	8	21
Paracetamol	8	19
Amodiaquine	7	21
Chloroquine	6	8
Camoquin	5	6
Fansidar	5	9
Quinimax	5	7
Other ACT	4	6
Nivaquine	4	5
Artesunate	3	3
Drip with own combination of drugs	3	3
Efferalgan	2	7

Whilst many of these were preferred by some individuals, others reported themselves or others close to them experiencing side effects which usually deterred them from taking the drug again. Most frequently mentioned for its side effects was quinine causing itching and ear problems, also ‘drugs with sulphates’ were reported to be problematic and ‘the white and yellow drugs’ were deemed very strong and therefore not good for children, according to one respondent.

Interestingly, for intervention design, one respondent described how he continued to take nivaquin in spite of the side effects because of the explanation given at the hospital,

Side effects can be tolerated if they are rationalised

‘I went back to the hospital the doctor told me that the drugs affects me because it is fighting with the illness in my body. So it is fighting with the illness. He said I should continue to take the drugs and that when I complete the treatment whatever the drug is causing to me will stop. I completed the drugs and some days later the thing stop’. (P5 FGD 207 Bamenda, adult men)

7.2.2 Preference for traditional medicine

Traditional medicine was reported to be used as a primary recourse for mild illnesses, for specific illnesses that can only be cured with traditional medicine, as a cheaper and less risky (for side effects) alternative to biomedicine and because efforts to procure biomedicines are thwarted by the superior attitudes of health workers.

Traditional medicine as primary recourse – particularly ‘heat shock therapy’

‘The leaves are many. As I boil the leaves, [P2 interrupts ‘I do not boil, I squeeze the leaves. You do not boil, you just squeeze them’]. Ok, I take fever grass, Black jack, paw-paw leaves as she has mentioned, take the roots of a paw-paw tree, plantain leaves, yellow plantain leaves, pear leaves and boil in one pot. I remove and store some in a five litter container for drinking. The rest, I take a blanket and cover myself over the pot when the hot vapour is still coming out. [P4 is showing how she would cover herself with the blanket over the hot pot] After three days the fever is gone. [All participant nodding their heads to confirm]’. (P4, FGD 203 Bamenda, adult women)

‘When I have malaria, the first of things I do is to make a tisanes. I harvest the leaves, boil and drink or I do a mixture of several herbs. I harvest; bitter leaves, cassava leaves, grind them, boil them and cover up. If after covering up I am not still relieved, I then go to the hospital’. (P3, FGD 403 Yaounde, adult women)

Traditional medicines for specific illnesses

‘For me there are some illnesses in a child that you cannot give him ... that ... that you cannot give him drugs. You can give him traditional treatment and the child gets well’. (P5 FGD 205, Bamenda, primary care givers)

Traditional medicines as a complement to biomedicine

Ok, when it happens that he has lost appetite, normally one could take him to the hospital. If it is not so serious to rush to the hospital, we have health centres. I do not know if some of us have health centres located nearby. Yes, we have community health what? [F:community relay agents] Yes, go to them. Some of them have knowledge more than the nurses. When you meet them they will give you drugs which you will administer immediately to the baby. In the situation of the child’s palms which you said are white, it is evident that the child has shortage of blood. I think you could take him |her to the hospital. For the appetite, they have this... how is this drug called? There is a drug for it, which is [P9, P6 said vitamines] vitamins. Yes, they have multivites <<multivitamins>> which you could give to the child. Then, I wish to say even though Doctors do not want the use of herbs, there are some traditional herbs which when the child is sick, you can havest, boil and give to him |her. It gives a lot of blood to children.[F:Yes] (P1, FGD 201 Bamenda, primary care givers)

Cheaper alternative to biomedicine

- P2 An illness like asthma for children we know that if it is [treated] with traditional medicine, they will get well
- F Like asthma?
- P2 Yes we mostly give traditional medicine to children before they are treated of asthma.
- F But have you treated it in the hospital and they do not get well?
- P2 The hospital treats it but the thing is we do not have money. Grand mothers know it. If it starts in a child they will know so we go for the traditional treatment.
(FGD 205 Bamenda, primary care givers)

Traditional medicine is less risky for side effects

‘Well, with this Quinine, you have to be aware of the allergy that P2 spoke of. For example, I

personally it's been years now since I last took a tablet of Quinine or a tablet of, how is it called.. In fact any product derived from Quinine because I had severe allergies. My ears were plugged, swellings, oedema everywhere. Finally, I stopped and now I am in traditional medicine, a little bit because I make remedies against all of those. So for many years now, I rely only on traditional medicine and it works'. (P6, FGD 404 Yaounde, adult men)

Use traditional medicine because HWs ignore us

They [health workers at health centres] sometimes they just go past us as if they were moving pass bodies ofI do not really know what to say [P8 raised her hand to show that she is of the same opinion] what is it for? Hmm? They look down on us. It is, and when we finally get back home what do we do? We are obliged to look for herbs. Yes, I harvest cocoa leaves euh...pawpaw leaves. I take all of them and mix. I then take the gui « a plant locally called gui d’Afrique» I do that....I take all of them and make a concoction. I then say to myself, “well, since I cannot be treated at the hospital, I would take this and be quiet” (P11, FGD 403 Yaoundé, Adult Women)

7.2.3 Preference for specific modes of delivery

As well as specific medicines that were preferred by individuals, some mentioned specific modes of delivery – in some cases, tablets were not as effective as syrup, injections more effective than other forms of therapy and drips identified with better health outcomes.

Preference for injections

‘The nurse there advised me that now that the child is like this, when he ever starts I shouldn’t give him anything. I should bring him to the health centre and that I should just forget the paracetamol or any syrup. I only take him to the health centre. I never give him any drugs at home and the drugs that they give, they only give him an injection before they can reduce the fever’. (P12, FGD 205 Bamenda, primary care givers)

Preference for drips

‘Yes, I prefer having drips as treatment for malaria. [F: Could you elaborate more on that?] Euh... In my opinion, because everybody has his/her system, it depends on the person’s system. When I have malaria, I prefer having a drip. I go the hospital and consult. Most often, when I take Coartem, I do not regain my health but when I take a drip, I get better. (P5, FGD 405 Yaoundé, adult women)

7.2.4 Importance of supplements

Many community respondents cited food, drink and vitamin supplements as promoters of health when experiencing malaria. Amongst foods mentioned were: fruits, rice, beans, coco yams, fats, oils and fish; drinks included water and guinness; supplements included vitamins and iron tablets.

7.3 Malaria is an acceptable disease

Both health workers and community members considered malaria to be a preferable diagnosis to most other alternatives (Table 6 and Table 7).

Table 6. Reasons malaria is a preferable diagnosis: community perspective

Code	Number of FGDs discussing item	Number of references across all FGDs
We know malaria and know it can be treated	14	42
• We know they can treat it	8	14
• We know we can manage it	4	4
Malaria is less devastating than other diseases	14	38
• It does not have long term implications	8	12
• You don't feel so devastated	5	11
• It is less likely to kill	5	6
• Other diseases have more expensive treatment	4	5
• Other diseases have harder treatment to take	4	4
• Malaria is not stigmatised	2	2
Malaria is a firm diagnosis so can be confident of recovery	7	16

Table 7. Reasons malaria is a preferable diagnosis: health worker perspective

Code	Number of FGDs discussing item	Number of references across all FGDs
Patients come expecting malaria	16	38
Malaria can be treated	13	24
To have malaria is so commonplace	13	23
Patients are relieved to get a malaria diagnosis	12	29
Malaria is a less distressing disease	8	11
Malaria treatment is less expensive	4	5

Interestingly, the health worker statements about why malaria is a preferable diagnosis when compared with other diseases demonstrate a strong awareness of what patients expect and respond well to. It shows that health workers are very aware of how patients feel and may tailor their prescribing and diagnostic decisions on the basis of this awareness.

7.4 Broad role of antimalarial drugs

Health workers reported prescribing antimalarial drugs frequently in their practice, to around 75% of their patients. We found that the role of antimalarial prescription went beyond simply treating plasmodium parasites in the blood. The prescription of these drugs had many more functions, as has been suggested in the community perception of the disease and its treatment above. Table 8 exemplifies this broad role of these special drugs from the perspectives of the health workers in this study. Most of these responses were given during discussions after a question asking 'what do you

use antimalarials for?’

Table 8. Roles of antimalarial drugs: provider perspective

Code	Number of FGDs discussing item	Number of references across all FGDs
To treat signs and symptoms of malaria	17	120
As presumptive treatment when tests aren't possible	17	62
• If there are logistical problems at the laboratory	15	30
• To avoid cost of testing for the patient	12	23
As presumptive treatment because it is a malaria endemic zone	13	24
To build a good relationship with the patient	11	15
• To treat what the patient thinks they have	5	5
• To respond to patient demand	4	6
• To provide psychological treatment (if the patient believes it will cure him)	2	2
Give antimalarials if already taken antimalarials prior to consultation	9	12
Because malaria should be treated first	8	13
To see if they have malaria- if they respond to the antimalarial	6	6
Treat with an antimalarial if can't find another cause	3	3
To cover malaria just in case	3	3
In inpatients, antimalarials are given routinely	2	3
To kill parasites	1	1

The top and bottom responses are interesting to note: signs and symptoms are mentioned as a reason for using antimalarials far more frequently than for killing parasites. A number are related to the habit of presuming all fevers are malaria, such as the endemic zone and treating malaria first. Others indicate uncertainty- 'just in case' or 'if can't find another cause'. And, building a good relationship with the patient is interesting, to respond to either their demands or to provide psychological treatment such that the antimalarial functions as a placebo:

Antimalarials as a placebo

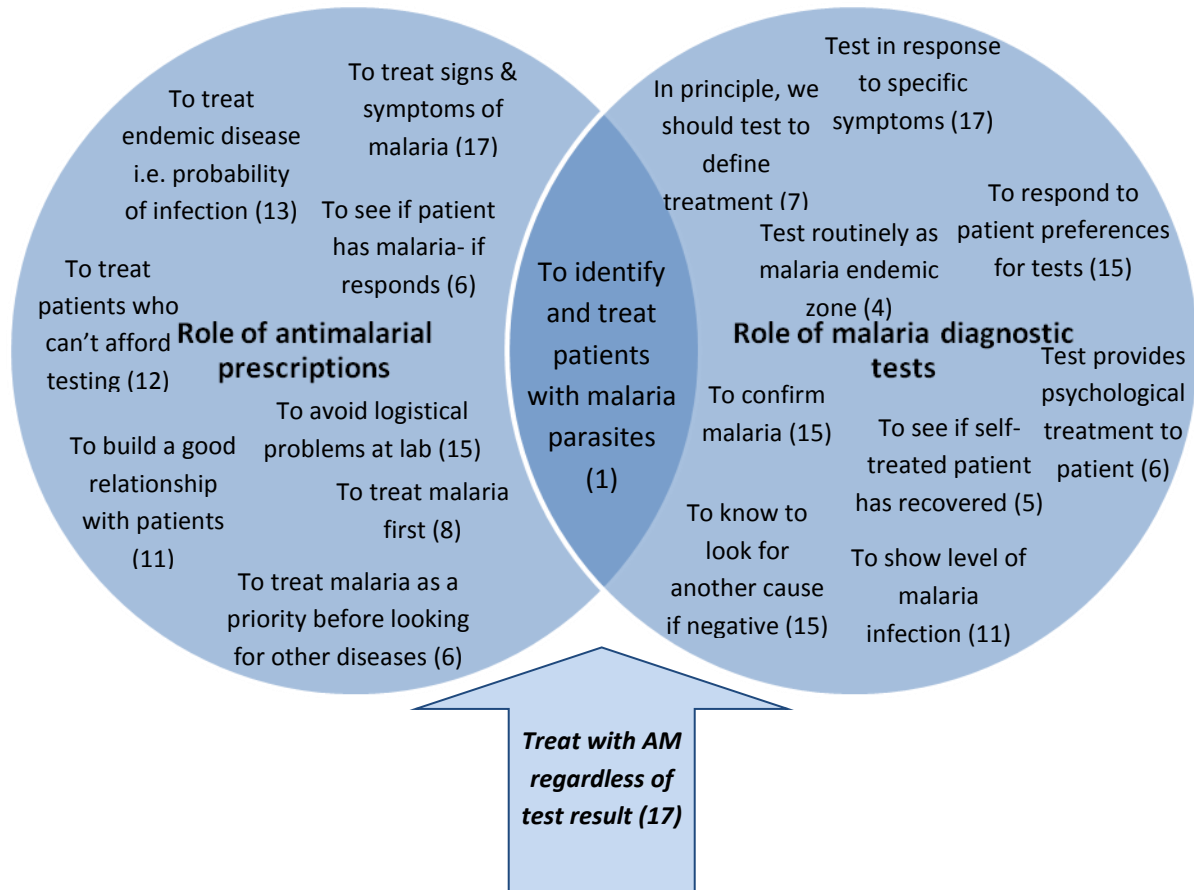
'I will give the prescription because he/she already believes that if he/she takes the malaria treatment he/she will get well. So what I will do is preferably prescribe the malaria treatment and you go and with that he will get well'. (P4, FGD 104 Bamenda, mission facility midwives/nurses)

7.5 Discrete role of malaria tests

As with antimalarial drugs, we found that malaria tests had multiple functions aside from looking for parasites in order to inform treatment decisions. In fact, the tests were not considered central to the decision to use antimalarials. Figure 1 shows some of the roles of malaria tests. Significantly, we noted that the role of the test only overlaps with the diagnostic decision to an extent, when it is

used to decide on antimalarial treatment for patients with parasitaemia.

Figure 1. Discrete roles of antimalarials and malaria tests



Health workers in all 17 FGDs stated that malaria test results do not change their treatment with antimalarials (84 references). Reasons for this are shown in section 7.6.

Noteworthy are the number of functions that apply to both antimalarials and testing:

- The use of antimalarials and malaria tests as '**psychological treatment**', or a symbol of care that strengthens relationship between patient and health worker with positive outcomes for both parties
- That **signs and symptoms** are most important in defining when to test and treat
- Perception that **malaria is endemic** so testing and treatment should occur routinely
- **Prior treatment with antimalarials** prompts further antimalarials and malaria tests

7.6 Importance of giving antimalarials even if tested negative

All focus group discussions with health workers found health workers attested that antimalarial treatment should be prescribed in spite of having done a test, whatever the result.

Test negative does not mean no malaria

F: If your patient has a negative malaria test but has fever or other malaria symptoms, how do you decide what treatment to give? Yes P11...

P11: Euh...When we do the malaria test and it comes out negative, it does not prevent the patient from having his malaria.

F: And in such a case?

P11 : We continue with the antimalarial treatment.
(FGD 305 Yaoundé, mission facility midwives/nurses)

Reasons for specifically prescribing antimalarials to test negative cases are grouped in Table 9.

Table 9. Reasons given by health workers for prescribing an antimalarial to test negative patients

Code	Number of FGDs discussing item	Number of references across all FGDs
Mistrust in test results	16	61
• Test may not detect the parasites	13	18
• Test results conflicts with signs and symptoms	10	16
• Patient may have already taken an antimalarial and should therefore be treated presumptively	8	15
• The lab staff may lack skills	7	12
• Previous experience that test negative patients had malaria	5	7
Negative results are difficult to negotiate with patients	17	45
• Patients are disappointed	9	10
• Patients are worried	7	9
• Patients doubt results	7	9
• Have to convince the patient	6	12
• Patients ask questions	5	5
• Some HWs tell the patient they have malaria	3	5
We know malaria from history	7	11
We know malaria from examination	7	9

Mistrust in a negative result is better than mistrust between patient and health worker

‘It was just to say that when the result is negative whereas we think that it is malaria, we are also surprised. We are surprised as doctors and well, it could even make us to think of something else. But generally, what happens is that like we said, when there is a fever, you have to treat the malaria, and sometimes we could even start to explain to the patient that the test is a dependant factor. It depends on the person who did the test, it could depend on the time in the day, the place form which is was collected, it depends on a lot of things, and the way by which you explain that to the patient, and the relation you have, put him in confidence’. (P5, FGD 306 Yaoundé, public facility medical doctors)

Health worker perceptions that patients would question negative results were upheld by responses from community members. When asked about their experiences with negative malaria test results,

11 of 14 FGDs discussed issues around wanting to know what was going on if not malaria. Most said they would want further testing to be done and an explanation from a doctor. Giving a negative result was seen by some as an affront to the patient's own ability to know their illness,

Negative result means the doctor is lying to me

'I will think that I was wrongly diagnosed by the Doctor. Because I cannot be feeling sick then I go to the hospital the Doctor says I am not sick. What is that? [P3 murmurs at the background] If I am feeling sick then the Doctor gives my book negative that means he/she is lying to me'. (P4, FGD 204 Bamenda, adult women)

The trust community members described in relation to microscopy was described in 9 FGDs as contingent on whether they recovered with the subsequent treatment given. Experiences described by patients when they had believed test results were more commonly related to having been given a positive result and antimalarial treatment, followed by recovery. However, in 6 FGDs, community participants stated that microscopy could be incorrect, in each case exemplified by negative results when the respondent believed there was malaria. Further reasons for trust/mistrust from the community side are shown in Table 10.

Table 10. Reasons community members trust or mistrust tests

Code	Number of FGDs discussing item	Number of references across all FGDs
Trust result if recover after treatment	9	17
Distrust result if negative but know it is malaria	6	7
Ignore result if symptoms of malaria are present	6	9
Testing is good if it confirms the disease	4	8
Testing is irrelevant because we are given antimalarials even if it is negative	3	6
Test accuracy is determined by the reader	1	1
Test is trustworthy if a second test gives same result	1	1

8 Results II: Values at health centres

Table 11. Aspects of care that were valued by community members but need strengthening

Code	Number of FGDs discussing item	Number of references across all FGDs
Being attended to personally (caring for patients, treating them nicely, good interpersonal skills)	14	62
Staff professionalism	13	108
• Accountable (not corrupt or money-minded)	12	58
• Professional attitude (discipline, comforting, patient centred, respect for the job)	9	23
• Carry out proper medical process (give advice, explanations, information, examinations, correct medication)	8	19
• Treat patients equally (unbiased services, not neglecting or ignoring patients, keeping confidentiality)	7	13
• Qualified, well trained staff	5	8
Being prescribed medicine	13	46
Being well received and guided at the health facility	11	57
Receiving medicine that leads to recovery	11	32
Being tested	11	34
Consulting a doctor	10	21
Having fast services	9	26
Affordable services	8	33
Good facilities	5	11

Importance of professional staff behaviour

'Yes. I wanted, I would get in to the same logic as P8, by saying that those doctors and nurses are supposed to have a professional dedication. They must be passionate. They ought to know that when someone is sick, they should place themselves in the place of the person who is sick because he too could also be found in a similar position. Well, he could have the advantage that being of the medical body; he would be easily treated by his colleagues. But some of us who are outsiders, what would be our fate? All we endure is suffering. Hmm...We could easily go unconscious. As regards drugs at health facilities, if they cannot be given freely, they should at least be given at a low price because you would have to take into consideration all the societal spheres. And, uh, to begin with the, the impoverished, those who are too poor, because of we talked of the affluent, everybody would go to the clinics. If we go to a health centre, it's because we do not have the means «to go to clinics». He «rich person» knows that when he goes there «clinic», the doctor, he would be treated immediately and he would then go back home. We go to the health centres because that's what we can afford. That is what we can afford. They «Health workers» should warmly receive us. They

should be professionally dedicated'. (P11, FGD 403, adult women)

Providing good quality health care that went beyond the prescription of drugs was identified as important by the health workers in the study who gave a number of reasons for improving the care they provide:

Table 12. Why good quality care is important, as reported by health workers

Code	Number of FGDs discussing item	Number of references across all FGDs
Gives psychological treatment	9	10
Facilitates the healing process	5	7
Builds confidence of patients	5	7
Builds a trusting relationship with health workers	5	6
Patients will return to the health facility	5	6

Table 13. Aspects of care that health workers identified as attracting patients to health centres

Code	Number of FGDs discussing item	Number of references across all FGDs
Welcoming and guiding patients	15	26
Good interpersonal skills of staff	13	20
Availability of drugs	9	12
Timeliness and monitoring of patients	8	10
Improving the condition of patients	8	10
Affordable treatment	8	10
Accessibility to the health facility	4	7
Availability of testing services	4	4

Important to note here is that the social relationship between staff and patients was valued more highly, even by health workers, than other aspects of health facilities such as availability of testing.

9 Results III: Reasons for provider use of ACTs over other antimalarials

From a health worker perspective, the principal reasons for decisions over which antimalarials to prescribe were cited as consideration for patient ability to pay and patient preferences of specific treatments. In addition, lack of knowledge of which treatment was currently best was cited by some, although most were aware of current guidelines.

Quinine is cheaper

'But in our services, it sometimes depends on the patient's purse, so we might start with the first stage like quinine which might not be helpful. Then, if someone can pay more, we now prescribe the combinations Artesunate/ Amodiaquine' (P4, FGD 304, Yaoundé public midwives/nurses)

Ask which antimalarial is right for that patient

'When a patient comes is usually very preferable to ask, "are you sick?", and as confirmed it is malaria, "Normally when you have malaria positive, what do you normally take?" Because some people may go to take a particular drug and in that reason now, there is a possibility in their life that it will come. Their bodies have developed resistance to that particular drug. You have to take note of that. And if it has developed resistance, you have to advise the patient to switch to another one. (P3 FGD 106 Bamenda, mission midwives/nurses)

Patient demand is hard to ignore

'At times we feel a little bit worried because at times patients come and say what you are supposed to prescribe. These are at times informed (educated) people and when you want to prescribe this they say "you can prescribe me this". [Many laugh] At times, "Sister why do you not prescribe me this?"' (P6, FGD 102 Bamenda, public midwives/nurses)

We sometimes get stockouts of the 'right' drugs

- P4 The other point is sometimes drugs are not available. I had this experience a number of times at the North West Special Fund for Health, coartem was not available even Falcimon kit was not available.
- P6 Even now it is not available
- P4 So we were in trouble because we have quinine in your hands to prescribe to the patient or you send that patient to town that has to pay one thousand FCFA of transport to get to town to get the drug. It is a bit difficult.
(FGD 107 Bamenda, mission facility medical doctors)

Some drugs can only treat one strain of malaria

'And also take note of certain strain of malaria parasite [F: euh hum]. There may be some bitherapies which treat only one strain, other gametocytes and schizonts as well'. (P7, FGD 303 Yaoundé mission midwives/nurses)

We don't know which antimalarial is most effective

'I would like to go back to the antimalarials because there are so many out there now. We do not even know which is more effective than the other. Well we just prescribe them like that. It also depends on the routine. That is to say, I, I am used to quinine. I know that when I take quinine.... It is quinine that suits me a little bit more as compared to Coartem and as compared to camoquin [P7 scratches his head] compared to the multitude of antimalarials'. (P11, FGD 305 Yaoundé, mission

The reasons patients had preferences for specific drugs relates to the findings described in section 7.2, and these preferences were clearly known by health workers. Side effects played a large role in choice between specific antimalarial drugs, as described above. In addition, the notion of what is an efficacious drug was interesting: sometimes the ‘side effect’ of a drug was seen as a symbol of recovery. Most commonly (in 8 FGDs) community members mentioned sweating as a sign of recovery, but others also mentioned that sleeping (with coartem), weakness (with amodiaquine) and itching (with quinine) are signs that you are recovering.

10 Results IV: potential channels of communication

In terms of communicating with health workers about the introduction of RDTs, suggestions from participants were all around training – having more regular training, enabling everyone to attend, setting standards of care at the training that illuminate HWs on what the current practice should be. Supervision was also discussed, and health workers shared their positive and negative experiences, with suggestions for improving supervision.

10.1 Training

Health workers reflected on recent training experiences, particularly changes of antimalarial first line treatment, and gave positive reports about what they had learnt and that attending the course gave them confidence to start prescribing differently.

Training can be effective in changing prescribing

‘Like we were telling you lately, I, since then, it is the recent training session which ‘[Speaking at the same time as P6 and unknown]’ I was, there, it was truly a training session and I what I learnt in addition, I was scared of Amodiaquine, but since then, it has at least change in my mind. I could open up my double conviction, I recommend it to people and I prescribe at least’. (P1 FGD 302, Yaoundé public midwives/nurses)

‘It is quite true that antimalarial drugs are disorderly prescribed. So that training changed us positively in the aspect that for uncomplicated malaria, we limit ourselves to the combination therapy. [F: euh hum] Because at first it was quinine which was the molecule disorderly used [F: Yes]. So there was actually a change’. (P8 FGD 303, Yaoundé mission midwives/nurses)

‘It has changed my therapeutic habits. Because before I had my personal criteria. I had the tendency to give quinine or Coartem to every malaria case. As regards the secondary effects, I made the choice. Now, I have to follow the algorithm if I can say it that way’. (P4 FGD 307, Yaoundé mission facility medical doctors)

Retention of knowledge from training sessions seemed good. However, the gap between knowledge and practice was also apparent. This seemed due to both logistical factors and social factors.

10.2 Supervision

Most respondents reported that supervision was infrequent and, when it did occur, not helpful to them. Existing supervision was reported to be carried out by the district health team (mentioned in 12 groups), the MoH public health team (8 FGDs) by the region (4 FGDs) or by a mission group (3 FGDs). In 10 FGDs, health workers reported they had received no supervision at all. When it was conducted, supervision was reported to occur every few months, although the nature of ‘supervision’ varied according to different respondents- for example, for some, checking the fridge for vaccines was considered as supervision. The most common activity reported to be carried out by supervisors was collecting statistics about patients – which some HWs reported that they did themselves and then sent to the district, meaning there was no supervisory visit. When they did visit, they were reported to check registers to see what patients had been diagnosed and treated with, also mainly for documentary use. Supervisors were also reported to have interacted with health workers when they were checking their practice through registers and also occasional observations as well as by giving briefings on changes and improvements to practice. They were also reported to come to check the physical state of the health facility as well as management practices (Table 14).

Table 14. Activities of supervisors when visiting health facilities

Code	Number of FGDs discussing item	Number of references across all FGDs
<i>Supervisors collect information from health facility</i>		
They collect statistics about patients	12	19
They review registers, e.g. to see what patients have and treatment has been given	10	17
<i>Supervisors check up on us health workers</i>		
They check on adherence to treatment guidelines	9	11
They give us suggestions and briefings	5	6
They observe what we are doing	4	4
<i>Supervisors check up on the health facility</i>		
They check how the HF is managed, including finances, information management, presence of protocols	7	8
They check on drug stocking	4	5
They check on equipment and supplies (e.g. fridge)	2	4

However, reports of these activities suggested they were more occasional than routine, as described by this respondent who was himself a supervisor,

Supervisors rarely come and their focus is statistics not processes

‘I’m talking in all the domains, either up or down or across, it [supervision] is very rare. I think that I’m soon going to be ten years in the region and I have not remember, I cannot remember when the regional hospital came to, to assess any of those approaches. Contrary, when supervision is being done, we go in for supervision in a way of [P3: control] trying to check the cases, you understand?’

How many cases have you had? How many cases did you declare? We have scarcely even checked the processes that we have used to arrive at those cases, you understand what I mean? That is, from the reception to the lab, back to the prescriber, to the pharmacy, and what have become of the patient? We scarcely [know].’ (P1 FGD 105, Bamenda public facility medical doctors)

Whilst feedback from supervisory visits was sometimes reported, health workers complained that they did not get useful feedback on how to improve, or positive reinforcement for good practice,

Feedback from supervisors is lacking

‘I am of the same opinion as she. Considering the last time when they were around here, euh...after all those people, till date nobody has said ok “you have to adjust here, it was well done, may be at this point you have to review and adjust.” It really disturbs us, we are there, we do not know if we are doing well or if there are things to be adjusted .’ (P9 FGD 300, Yaoundé Public facility nurses)

In some cases, the lack of feedback may be related to supervisor competency not only in how to supervise but in the topic area that he is supervising in, as described by this medical doctor,

Supervisors may lack the skills in the topic area

‘One of the, one of the, the worst things that has happened during supervision is that, most of the time the supervisors themselves are not versed with the problem they are supervising. Take for example, somebody who has spent all his time in the office and he has not been in the field, he has not palpated the problems, and he comes to supervise you, it is very likely that he too, instead of supervising you is only learning if at all he wants to learn [P1, P5 and P4 acknowledging by head nodding].’ (P5 FGD 105, Bamenda public facility medical doctors)

In addition to a lack of feedback, health workers also complained about supervision coming as a surprise and wanted to have warning for when supervisors would come. However, some health workers reported that supervision had had a positive impact on their work. This was reported as general improvements, learning new things and being corrected (Table 15).

Table 15. Positive characteristics of supervision

Code	Number of FGDs discussing item	Number of references across all FGDs
Supervision is good when we get feedback	5	5
Supervision is good when we get information and education	4	6
Supervision is good when we get encouragement and appreciation	4	5
Supervision is good when we are corrected	3	5
Supervision is good when it is regular	3	3
Supervision is good when we receive recommendations	2	2

Three main suggestions from health workers for improved supervision were: that it should be regular and everywhere; that supervisors understand the problems faced at HFs and best practice solutions; and that supervisors should give feedback and information to health workers.

11 Discussion

In this qualitative study, community members in two regions of Cameroon conveyed highly personalised interpretations of malaria, its causes and the most effective treatment for it, which were expressly acknowledged as being distinct from others'. Individual lived experiences of bodily symptoms (and similarly the experiences of participants' children) constructed an authority of knowledge over the identification of 'my malaria' (or 'my child's malaria') and the most appropriate treatment-seeking approach. These varied and individualised interpretations of malaria were discrete from conceptualisations of a diagnosis of malaria as the outcome of a care-seeking episode at a health facility, the latter often being perceived as an acceptable and even welcome diagnosis, due to the ease of treatment in comparison with other possible disease diagnoses. Similarly, diagnostic tests for malaria within a health care setting were frequently perceived positively for their ability to direct the most appropriate treatment for an illness, but these perceptions were typically conveyed in abstract from the individualised narratives of malaria.

The findings from this study indicate that community members held compelling 'explanatory models' for their malaria that conveyed logical narratives for the interpretation of experienced symptoms and identification of an illness episode as malaria (A Kleinman, 1980). Being highly individualised, these multiple explanatory models for malaria rarely coincided completely with each other, or with the accepted biomedical narrative of fever, parasitologically-confirmed diagnosis, recommended treatment. As such, it indicates potential challenges for the integration of a binary diagnostic technology, the RDT, into a context of innumerable conceptualisations of 'my malaria'.

The value of phenomenological accounts of illness experience has been recognised for its potential contribution to understanding the boundaries and limitations of biomedicine (Kaufman, 1988). In the case of malaria, to consider how individual conceptualisations of malaria and appropriate treatment intersect with the biomedical function of RDTs for improving case management, can help draw attention to the limitations of these diagnostic technologies and how interventions can be developed to overcome these. Health workers at facilities in the same districts included in this qualitative study described the challenges they faced in managing patients' understandings of their illness and expectations from diagnosis, when testing for malaria, with some fearing that a negative test result might undermine their position and authority, in the patients' eyes (C Chandler et al., 2012). The introduction of RDTs alone is unlikely to facilitate the management of dynamics between health workers and patients, but in fact may contribute to tensions between different and often competing sources of knowledge around illness within the clinical encounter: the patient's knowledge of 'my malaria' from an awareness of the 'individual body-self' (Scheper-Hughes & Lock, 1987); the health worker's professional knowledge and interpretation of clinical guidelines; and the knowledge or information conveyed through the test result.

In considering how best to scale-up the use of new diagnostic technologies for improving case

management of malaria and appropriate prescriptions of ACTs, it is important to reflect on how these technologies will align with existing conceptualisations of malaria and what constitutes appropriate treatment. The global policy guidelines for use of RDTs in malaria case management (World Health Organization, 2010) follow the ‘technological imperative’ whereby health care problems are assumed to be manageable through technological solutions (Barger-Lux & Heaney, 1986). The policy focus on developments in technology, representing symbols of hope within biomedicine (DeIVecchio Good, 2001), neglects to acknowledge the work that needs to be done to integrate these technologies with the cultures of understanding illness faced by health workers within their practice, and their interactions with patients (C Chandler et al., 2012; Reynolds et al., 2013).

Yet, the findings of this study also hint at potential for the incorporation of malaria diagnostic tests into the routine clinical encounter in Cameroon. Community perceptions of a malaria diagnosis as an acceptable, and often preferable, outcome of a clinical encounter, and testing for some was viewed as a valuable method by which to identify the cause of disease and appropriate treatment. Although these perceptions were commonly conveyed in abstract from the personalised accounts of ‘my malaria’, it suggests that the ‘acceptability’ of RDTs reported elsewhere in sub-Saharan Africa (Asiimwe et al., 2012; Baiden et al., 2012; Mukanga et al., 2012), could potentially be applicable to the Cameroon setting also. However, it is important to recognise that expressions of ‘acceptability’ among patients may mask the complexity of the network of interactions surrounding the RDT in the clinical setting, where challenges might be faced when patient expectations for the outcome of a test are not realised (E. K. Ansah et al., Under review).

Conclusions

When developing interventions to improve the appropriate diagnosis and treatment of malaria in line with current guidelines, it is vital to consider how the introduction of new diagnostic technologies will align with current systems of knowledge of malaria and its treatment across the community, and the influence of these on the process and outcome of a clinical encounter. In Cameroon, the scale-up of RDTs must be supported by mechanisms to facilitate health workers in negotiating the expectations of their patients, who hold authority of knowledge over their experiential understanding of illness. Although, potentially ‘acceptable’ to the community at one level, the biomedical function of RDTs as a fixed, binary test to be universally-applied, is at odds with the highly individualised conceptualisations of how to identify ‘my malaria’ and its appropriate treatment. The potential tensions arising from this will need to be managed carefully by health workers, particularly in the face of a negative test result, and mechanisms to support this are strongly recommended.

12 Recommendations

This qualitative work found several underlying themes upon which recommendations can be built:

- Health workers are strongly driven by perceived patient expectations and patient satisfaction with their services
- Patients perceive many different symptoms as malaria; they also see malaria and malaria treatment as different for different people
- Social functions have formed around aspects of the consultation process, particularly prescribing medicines but also testing, which are seen as symbols of good care in spite of the biomedical process of curing the 'disease'.

In order to introduce RDTs effectively according to WHO guidelines, they need to be used routinely and the results adhered to. When patients have malaria they should be prescribed with an ACT unless it is a complicated case.

12.1 Increasing uptake of RDTs

Patients and health workers like the principle of testing. However, in practice a number of logistical factors get in the way of using tests. The nature of RDTs means many of these will be overcome (speed, lack of need for electricity and reagents). However, there is still scope for personnel and timing issues to play a role.

A supportive intervention should aim to facilitate an adaptation period to encourage troubleshooting with the new tests, finding solutions to logistical problems that could be barriers to uptake. These are likely to vary from facility to facility and therefore a facilitative rather than procedural approach is likely to be most effective.

In addition, social factors play a role in testing – if health workers perceive the patient cannot pay for the test or will see it as irrelevant to the end treatment result, the health worker may choose to skip the test and move straight to treatment.

Cost of testing should be considered to be either tied into the cost of treatment or removed all together.

A supportive intervention should aim to enable health workers to explain to patients why testing is important and how the outcome will be different if they are tested compared with not testing.

Attracting patients to health facilities for testing will necessitate addressing some of the factors identified by both community members and health workers as needing strengthening. Giving personal attention and being professional were important attributes. These can be built upon as

aspirations.

A supportive intervention should aim to build on professional aspirations of health workers by setting standards and encouraging team work in adhering to standards that will attract and satisfy patients attending their health facilities.

12.2 Ensuring adherence to RDT results

There was no problem reported with trusting and adhering to positive test results currently. However, negative results were viewed with suspicion by both health workers and community members. This was principally due to the conflict between results and symptoms but also because the functions of the test were many besides identifying patients with parasites and therefore negative results treated with an antimalarial still made sense in fulfilling other, more social roles.

A supportive intervention should aim to target messages at both health workers and community members that 'malaria is defined by parasites: your symptoms may not be malaria'.

A supportive intervention should aim to target messages at both health workers and community members that malaria in different people can still be treated with the same antimalarial drug as long as that person has parasites. The reason people respond may be because they do not have parasites: they are suffering from another condition.

A supportive intervention should aim to equip health workers with skills to communicate effectively with patients about why they have a negative result and to provide an alternative course of action for the patient that still satisfies their need for a resolution to the problem and still provides the 'psychological' treatment that has been given with routine antimalarial prescription.

A supportive intervention should create opportunities for both positive and constructive feedback to health workers on their practices from others who understand the problems they face and are able to give support and ideas for improvements.

Although it was rarely discussed in these FGDs, we know that the ability to diagnose alternative causes of fever is a great concern to those confronted with negative test results.

Algorithms and standard alternative diagnoses and treatments need to be made that are simple and feasible in terms of tests examinations and treatments in these settings.

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