

SCHOOL OF PUBLIC HEALTH
COLLEGE OF HEALTH SCIENCES
UNIVERSITY OF GHANA

MALARIA CASE MANAGEMENT AND PRESCRIPTION PRACTICES BY
HEALTH WORKERS IN THE KWAHU SOUTH DISTRICT, EASTERN REGION

BY



THIS THESIS IS SUBMITTED TO THE UNIVERSITY OF GHANA, LEGON IN
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DECLARATION

I, Donne Kofi Ameme, declare that except for other people's investigations which have been duly acknowledged, this thesis is the result of my own original research undertaken under supervision and that it has neither in whole nor in part been presented for another degree in this university or elsewhere.

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DEDICATION

Dedicated to my family and friends



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I am very grateful to my supervisor Professor Edwin Afari for his guidance, direction and valuable contributions that helped in shaping this project.

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ABSTRACT

Introduction: Malaria, though a preventable disease, remains a major public health problem worldwide, particularly in Africa where it causes high morbidity and mortality in pregnant women and children under five. Effective case management involving universal parasitological diagnosis and targeted treatment with Artemisinin-based Combination Therapy (ACT) has been recognized as the cornerstone of malaria control strategies. Despite Ghana's adoption of these recommendations, the toll of malaria still remains unacceptably high. In most districts, malaria continues to top the list of morbidities. This study sought to assess malaria case management and prescription practices by health workers in the Kwahu South District.

Methods: A cross sectional study was conducted to extract both qualitative and quantitative data from health facility records and personnel as well as observe patient-health worker consultations. Univariate analyses of categorical variables were expressed as frequencies and proportions. Bivariate analysis was used to show associations between selected independent variables and appropriate malaria case management. Factors predictive of appropriate malaria case management and prescription practices were determined by multivariate analysis.

Results: Of 70 clinical observations and 404 records reviewed, 40 (57.1%) and 247 (61.1%) were females respectively. Median ages of patients were 18 years (interquartile range; 5-33) and 23 years (interquartile range; 12-38) from the observation and records review samples respectively. Overall, 158 (33.3%) patients were tested and treated according to test results; 53 (75.7%) from the observation

sample and 105 (26.0%) from the records review sample. All except six (1.3%) of those treated for malaria received ACTs. Patients appropriately treated with ACT who received Artesunate-Amodiaquine (AA) were 12 (36.4%) and 58 (57.4%) in the observation and record review samples respectively. Of the 14 chemical shop attendants, five (35.7%) treated malaria with Alaxin alone or Sulphadoxine-Pyrimethamine (SP) and 10 (71.4%) mentioned AA as the usual anti-malarial they gave to their clients. Predictors of appropriate treatment were measured temperature of $\geq 37.5^{\circ}\text{C}$ (AOR = 2.7, 95% CI = 1.48, 4.85) and being managed at a hospital (AOR = 9.2, 95% CI = 5.29, 15.95). Measured temperature of $\geq 37.5^{\circ}\text{C}$ was also an independent predictor of AA prescription (AOR = 3.2, 95% CI = 1.58, 6.51). Physical examination, diagnostic testing and counseling were the main tasks deficient.

Conclusion: Malaria case management and prescription practices in the Kwahu South District were sub-optimal. Except for chemical shop attendants, compliance with ACT was generally high. However, use of AA as first line was low. Physical examination, testing of suspected cases and counseling of patients also needed improvement.

Key words: Malaria, health workers, case management, Kwahu South

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LIST OF ABBREVIATIONS

| | |
|------|--|
| AA | Artesunate-Amodiaquine |
| ACT | Artemisinin-based Combination Therapy |
| AL | Artemether-Lumefantrine |
| AMFm | Affordable Medicine Facility-malaria |
| CHPS | Community-based Health and Planning Services |
| DP | Dihydroartemisinin-Piperaquine |
| IMCI | Integrated Management of Childhood Illnesses |
| ITN | Insecticide Treated Net |
| LCS | Licensed Chemical Seller |
| LQAS | Lot's Quality Assurance Sampling |
| NHIS | National Health Insurance Scheme |
| NMCP | National Malaria Control Programme |
| OPD | Outpatient Department |
| QHP | Quality Health Partners |
| RDT | Rapid Diagnostic Test |
| SP | Sulphadoxine-Pyrimethamine |
| WHO | World Health Organisation |

CHAPTER ONE

1. INTRODUCTION

1.1 Background Information

Malaria is an acute febrile disease caused by a protozoon of the genus *Plasmodium* and transmitted by the bite of the female anopheles mosquito. It is characterized by extremely diverse clinical manifestations. However, paroxysms of fever remain the most recognized presentation and widely used hallmark of the disease. The course and severity of the disease largely depends on the species of the infecting parasite, as well as the age, state of immunity, genetic makeup, general health and nutritional status of the patient and the effects of any chemoprophylaxis or chemotherapy that has been used.

Malaria remains a major public health problem worldwide with an estimated 3.3 billion of the world's population being at risk of the disease (World Health Organisation [WHO], 2012b). Though preventable and curable, malaria causes high morbidity and mortality especially among children and pregnant women in most developing countries. Globally, approximately 300 to 500 million clinical malaria cases occur each year with over one million deaths. Over 90% of the mortality burden is borne by sub-Saharan Africa, where an estimated one million malaria deaths occur each year with 75% of these deaths occurring in children under five years of age. This translates to one child in Africa being killed by malaria every minute (WHO, 2012a).

Malaria has a devastating economic impact on Africa causing an economic loss of \$12.5 billion per year and 1.3% reduction in economic growth in endemic countries

(Malaria Consortium, 2012; WHO, 2012a). In Ghana, malaria is hyper endemic with a crude parasite rate of 10-70% with *Plasmodium falciparum* being the dominant malaria parasite (Ministry of Health, 2000). It accounts for about 38% of all outpatient department (OPD) attendance (National Malaria Control Program [NMCP], 2010). It is the leading cause of workdays lost as a result of illness and therefore contributing the most to potential income loss compared to other diseases. Asante and Asenso-Okyere (2003) revealed that, nine workdays were lost by economically active people as a result of malaria while more than five workdays were lost by their caretakers.

Malaria control hinges mainly on prevention and case management. Preventive strategies, which employ integrated vector management approach including use of Insecticide Treated Nets (ITNs), Indoor Residual Spraying and environmental management coupled with Intermittent Preventive Treatment of malaria in pregnancy, yield good results. However, effective case management undoubtedly remains the fundamental pillar of malaria control strategies (WHO, 2010). Unmanaged and poorly managed cases form important reservoirs for transmission thereby increasing the disease burden. Effective case management leads to a rapid and complete cure of the *Plasmodium* infection thereby reducing the human parasite reservoir. This curtails the disease transmission and progression thus reducing morbidity and mortality.

Malaria case management including prescription practice has evolved over the past decade with the introduction of more efficacious and relatively expensive Artemisinin-based Combination Therapy (ACT) as well as universal parasitological confirmation being the cornerstone of this transformation. Until recently, prescription practices in malaria case management varied greatly in sub-Saharan Africa with

chloroquine and Sulphadoxine-Pyrimethamine (SP) being the main stay of malaria treatment. However, as a result of intense parasite resistance, the use of more effective ACTs has become the new trend, replacing chloroquine and SP which had become ineffective in most areas endemic for *Plasmodium falciparum* malaria. In 2004, Ghana made a transition from chloroquine monotherapy joining other countries that had adopted ACTs for the treatment of uncomplicated malaria. As at 2009, most *Plasmodium falciparum* endemic countries and territories majority from the WHO African Region had adopted ACT in their national drug policy.

In Ghana, though Artesunate-Amodiaquine (AA) remains the recommended first line ACT for treating uncomplicated malaria, revised malaria case management guidelines have made provision for Artemether-Lumefantrine (AL) and Dihydroartemisinin-Piperaquine (DP) as alternatives for patients who cannot tolerate AA. Availability these treatment alternatives therefore means that health workers are no longer restricted to AA for the treatment of uncomplicated malaria. The guidelines also strongly recommend universal diagnostic testing and prescription of ACTs for only confirmed malaria patients. However, lack of diagnostic services at lower level facilities as well as individual differences in health workers' clinical judgments and decision-making preclude strict compliance to this guideline. Variations in prescription practices are therefore bound to occur, making conformity to existing guidelines doubtful.

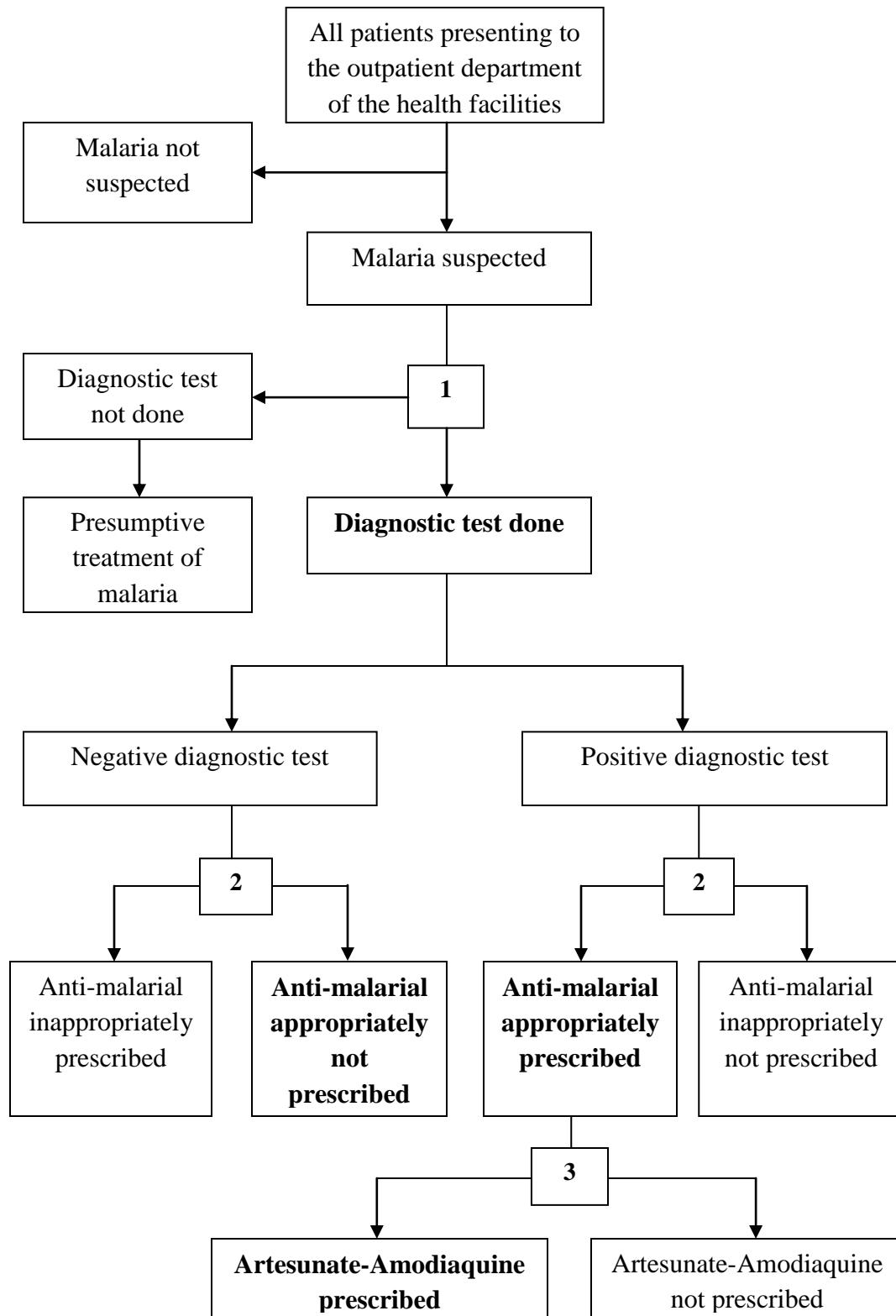


Figure 1. Malaria case management algorithm. Adapted from Sserwanga et al,

2011

In the algorithm of malaria case management (Figure 1), the bold track indicates appropriate malaria case management and prescription practices. From the algorithm, any suspected malaria patient who gets a diagnostic test, tests positive for malaria and is prescribed ACT or any suspected patient who tests negative and is not given anti-malarials is considered to have been appropriately treated for malaria.

The numbers in Figure 1 highlight the malaria case management indicators of relevance in this particular study. These are:

- 1 - The proportion of suspected malaria patients for whom diagnostic test is requested.
- 2 - The proportion of patients with negative diagnostic test for whom anti-malarials are not prescribed; and the proportion of patients with positive diagnostic test for whom anti-malarials are prescribed.
- 3 - The proportion of patients for whom anti-malarials are appropriately prescribed, who are prescribed AA.

1.2 Statement of the Problem

Malaria continues to cause high morbidity and mortality all over the world, with children and pregnant women in endemic countries bearing the brunt of the disease. In Ghana it remains the number one cause of OPD attendance with a general OPD attendance rate of 38% in 2010 (NMCP, 2011). However, effective case management and prescription practices particularly at the community level are key to its control (WHO, 2010).

The quality of case management including prescription practices depends on

availability of recommended anti-malarials and other logistics as well as training and supervision of health workers. In line with this and consistent with WHO recommendations, Ghana adopted the use of highly effective ACTs for malaria treatment. Malaria case management guidelines were also developed and revised accordingly. Training and supervision of health workers in malaria case management are also being done (NMCP, 2011).

However, the quality of malaria case management and prescription practices in Ghana, especially at the peripheral levels is arguably not optimum. Morbidity and mortality associated with the disease remains unacceptably high, casting doubts on the quality of case management. Kwahu South District recorded 34,085 cases of malaria in 2011 with malaria deaths constituting 10% of all institutional deaths in that year.

Improvement in malaria morbidity and mortality indicators will require a critical attention to malaria case management including factors that affect prescription practices. This study therefore seeks to examine the health worker malaria case management and prescription practices and explore into details factors that influence these practices.

1.2.1 Conceptual Framework

Malaria case management is influenced by several contextual and broad health care system factors. However, the factors of interest in this study have been compressed in a conceptual framework (Figure 2).

The proposed framework of malaria case management takes into account factors that have been categorized into patient factors, health facility factors and health

worker factors. These factors interact differently to impact the case management. A better understanding of how these factors interrelate would be useful in the development of appropriate policy interventions that will contribute to effective malaria case management.

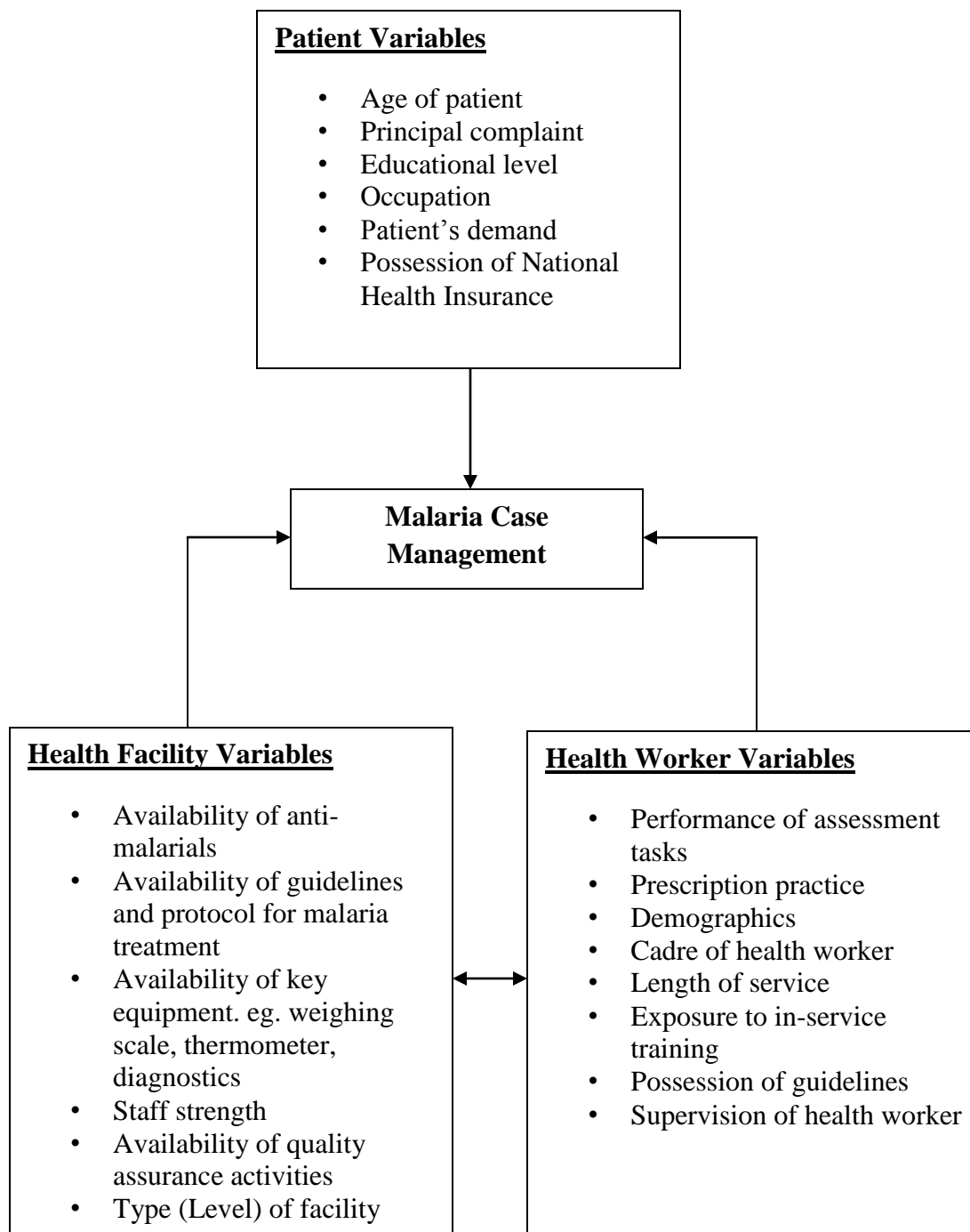


Figure 2. Conceptual framework; Malaria case management

1.3 Justification

In order to be on the path to achieving global and national targets of malaria control, case management must be at its highest attainable implementation just like other control strategies. Delivering a comprehensive malaria case management package at all levels is key to the achievement of most of the Millennium Development Goals as well as targets of universal access to treatment set by the Roll Back Malaria and Abuja Declaration initiatives.

The results of this study will be useful to the Kwahu South District, the Eastern Region, the NMCP and the country as a whole. The Eastern Region and the Malaria Control Program will use the results as an evaluation of the implementation of existing guidelines on malaria case management and identify areas to inform policy interventions.

The study will also generate information on the proportion of health workers who are managing malaria cases appropriately as well as the proportion of malaria cases that are being managed appropriately. This will reflect the uptake of malaria case management training messages and how these messages translate into practice. This will help in reforms in the training and supervision structure.

Also, factors influencing prescription practices in malaria case management will guide policy interventions as far as malaria case management is concerned. The interventions that will follow will ensure appropriate malaria case management thereby ensuring a healthy workforce and thus increasing productivity, protect current anti-malarials from developing resistance and ultimately reduce the national budget on malaria.

1.4 Research Hypotheses

1. Health workers are not managing malaria cases appropriately.
2. There is an association between patient, health worker and health facility characteristics and quality of malaria case management.

1.5 Study Objectives

General Objective

To assess malaria case management and prescription practices by health workers in the Kwahu South District in the Eastern Region of Ghana.

Specific Objectives

1. To assess health worker malaria case management practices.
2. To assess the compliance of health workers to recommended Artemisinin-based Combination Therapy for malaria treatment.
3. To determine the factors that influence prescription practices in malaria case management.

CHAPTER TWO

2. LITERATURE REVIEW

Malaria is endemic in over 100 countries worldwide (WHO, 2010). Africa contributes a major chunk to this with 43 malaria-endemic countries producing 78% of the total malaria cases and 91% of malaria deaths annually (Kaiser Family Foundation, 2011). The fatalities are usually as a result of lack of comprehensive case management programs.

Case management practices have attracted immense research attention all over the world particularly in Africa. It has been extensively studied mostly to evaluate health worker performance in the implementation of the new drug policies and guidelines. The methods used in these studies are varied therefore potentially precluding a strict comparison of the results. Some studies assessed case management in children only (Erikson et al, 2007; Nsimba et al, 2002; Osterholt et al, 2006; Sarrassat, Lalou, Cisse & Le Hesran, 2011). Others assessed it in all age groups (Juma & Zurovac, 2011; Zurovac, 2005). A few studied older children and adults (Zurovac, Midia, Ochola, English, & Snow, 2006). Some studies used record review while others used direct observation of health worker-patient interactions among other techniques.

However, the results are largely consistent in terms of the existence of gaps in case management. Though health worker adherence has been recognized as a key success factor in malaria case management, most studies have shown poor compliance of health workers to standard guidelines.

Malaria case management

A qualitative study conducted by Chandler et al (2008) in Tanzania showed that malaria case management by health workers was influenced by the mind and social constructs that were acquired during training and clinical career. The influence of initial training where the importance of malaria was emphasized, the influence from peers and the desire to conform to the expectation of colleagues, pressure to conform to perceived patient preferences as well as diagnostic support, motivation and supervision were the main factors that influenced over-diagnosis of malaria. According to Chandler et al (2008), the fact that malaria was easier to diagnose, a more acceptable diagnosis and that missing the diagnosis of malaria was indefensible were the mindsets that played a major role in malaria management.

A study done in Tanzania revealed that majority of children managed in primary health centres had received prior medication before presentation at the health facilities. Fifty-four percent had received medication at home, 20% had been taken to another health facility and 3% to traditional healers. This study showed wide inter-facility variations with respect to the proportion of children physically examined. Overall, 39% of children were physically examined and only 38% of children diagnosed of malaria had positive malaria test result. The average consultation time was observed to be 3.8 minutes (Nsimba et al, 2002).

Rowe et al (2009) observed that health worker performance in malaria case management in Angola was suboptimal with only 60% of malaria diagnoses and 49 % of malaria treatment being done correctly. They observed that only 30.7% of suspected malaria cases were tested contrary to recommended universal testing of suspected

malaria cases. There was a high rate of distrust of negative test results culminating in over diagnosis and over treatment of case patients. Erikson et al (2007) reported similar findings in Tanzania in 2007. They observed that even though 89% of under-fives were treated for malaria, history taking and counseling of caregivers were lacking. Also, in Kenya, Zurovac et al (2006) studied appropriate use and interpretation of malaria slide in outpatient malaria case management and observed that clinical assessment of cases was suboptimal. The shortcomings identified in the case management of malaria were not unique to these studies. A study in Burkina Faso to assess health workers' performance in malaria case management in rural dispensaries also showed that 24% of confirmed malaria cases were not given anti-malarials while 2% received anti-malarials without corresponding malaria diagnosis. They also observed that clinical diagnosis of malaria based on fever and or history of fever had a sensitivity of 75% and a specificity of 41% when compared to clinical malaria (Pfeiffer et al, 2008).

A qualitative study conducted in Kenya seven to nine months after the introduction of ACTs demonstrated that high cost, contradictory training messages compared to recommended guidelines and lack of follow up supervision were among the impediments to adherence to guidelines. Shortage of staff with concomitant increase in patient caseload was also identified as a major cause of the non-conformity to guidelines (Wasunna, Zurovac, Goodman, & Snow, 2008).

In Ghana, before the introduction of the new anti-malarial policy, the average number of drugs per patient was observed to be 5.4 and 3.7 in the private and government facilities respectively. The level of inappropriate dosing was very high

both in the private and public health facilities. Only 9.8% and 54% of prescriptions in the private and public health facilities were of the appropriate doses (Abuaku et al, 2004). Also, according to the 2008 Ghana Demographic Health Survey only 23% of children under five years old with fever were treated with ACT within 24 hours, which is at variance with quality case management practices (Ghana Statistical Service & Ghana Health Service, 2009). This indicator was 11.8% according to the 2011 Multiple Indicator Cluster Survey (Ghana Statistical Survey, 2012).

Compliance of health workers to recommended guidelines

According to a study in Benin, it was observed that in general health workers' diagnoses did not match gold standards Integrated Management of Childhood Illnesses (IMCI) classifications. The sensitivity for diagnosing malaria when compared with gold standard IMCI classification was 66.8% compared to less than 21% observed in all the other diseases. Incomplete assessment of sick children featured prominently as one of the serious deficiencies in management (Rowe, Onikpo, Lama, Cokou & Deming, 2001). Also, the use of ACT particularly AL was dominant over other therapies as 60% of the 1200 patients who needed ACT were given according to the revised guidelines in Uganda. Availability of ACT was recognized as the main factor that could optimize case management in terms of adherence to guidelines (Zurovac, Tibenderana, et al, 2008a).

In a rural Ugandan hospital, the anti-malarials frequently prescribed for uncomplicated malaria and severe malaria were AL (88.5%) and Quinine (84.6%) respectively. As much as 88.1% of the prescriptions conformed to the new anti-malarial treatment policy with duration of service less than 6 years (OR = 3.40, 95%

CI = 1.24, 9.33), prescribers profession (OR = 97.51, 95% CI = 27.29, 348.34) and diagnosis of uncomplicated malaria (OR = 10.13, 95% CI = 3.37, 30.42) being the main determinants of conformity (Ucakacon, Achan, Kutwabami, Odoi & Kalyango 2011). Prescription review was the method used in this study. In a similar vein, but using observation as the method of assessment, 66.8 % of patients diagnosed with uncomplicated malaria received the recommended first line ACT, with government health facilities leading the way in this regard (Quality Health Partners [QHP], 2008). Doodoo et al (2009) analyzed the prescription of a cohort of patients diagnosed with malaria and demonstrated that quite a chunk (33%) of the patients were prescribed artesunate monotherapy although overall, 90.8% of patients received treatment regimens containing artemisinin derivatives.

In India, contrary to ACT recommendation, artesunate monotherapy was available in 72.6% of the 196 health facilities and was prescribed for 14.8% of patients. Case management varied by public or private sector. In the private health facilities, 18.5% of the prescriptions were artesunate monotherapy whilst in the public health facilities artesunate monotherapy prescriptions constitute 6.9% of all prescriptions. Treatment in the private sector (OR = 8.0, 95% CI = 3.8, 17) was the strongest predictor of artesunate monotherapy prescription after controlling for other factors (Mishra et al, 2011).

In a study in North Western Nigeria, the pattern of anti-malarial prescription in selected primary health centres was observed to be based on availability of ACTs rather than recommendation by WHO and national policy on malaria treatment. Forty percent of anti-malarials prescribed as first line for the treatment of uncomplicated

malaria was ACT followed by chloroquine and artesunate monotherapy in that order (Umar, Chika, & Jimoh, 2011).

In Ghana, a health facility survey conducted by Quality Health Partners indicated that health workers' adherence to standard management guidelines was unsatisfactory (QHP, 2008). Amoakoh-Coleman (2007) in assessing the quality of malaria case management in the Dangme-West District also reported major health facility and health worker deficiencies impeding quality case management. In this study, good clinical history was taken for 52% of patients and only 20.3% showed a request for blood film microscopy. The findings also indicate that though 80.3% of the patients had the first line treatment of AA only 27.3% received the correct dosage. Overall, 29% of malaria cases were adequately managed. These findings were not at variance with findings from the Assin North District where health worker adherence to malaria treatment guidelines was observed to be 19.5% with dosing being the main drawback on quality of care (Amoako, 2007).

Laboratory testing and factors influencing prescription practices by health workers

Evidence suggests that symptomatic diagnosis of malaria is the norm in Ghana with less than 14% of malaria diagnoses in health facilities based on laboratory confirmation (Malaria Consortium, 2008). This is in contrast with WHO recommendation of universal testing and confirmation of malaria.

Malaria case management practices studied in Papua New Guinea prior to the introduction of the new policy indicated that only 15% and 3.6% of febrile patients

were tested by RDT and microscopy respectively. Disregard for test results was also prominent as anti-malarials were prescribed to 96.4% of all these patients including all test positive cases and 82% of test negative cases. Overall, 79.8% of the anti-malarial prescriptions were in conformity to the prevailing protocol (Pulford, Mueller, Siba & Hetzel, 2012). Dodoo et al (2009) in Ghana, also observed first line treatment conformity rate of 90.8% with laboratory confirmed diagnoses, age greater than five years, and attending government health facilities being the main determinants of conformity. The findings by Zurovac et al (2006) indicated that 72.7% of patients representing 78.5% of febrile patients and 51.3% of afebrile patients had blood slide microscopy performed. Disregard for test results was also significant as 95.5% of patients with positive malaria microscopy result and 79.3% with negative results were treated with anti-malarials.

In Sudan, a cross-sectional health facility survey indicated important gaps in malaria case management with regards to health worker practices, diagnostic capacity of health facilities and availability of ACTs. Overall 46% of febrile patients were parasitologically tested and 35% of patients were both, tested and treated according to test result. Among those who had positive malaria test, 64% were given the recommended ACT while 24% had artemether monotherapy. On the other hand, only 17% of the test negative patients were treated for malaria. The study revealed that, out of the 244 health facilities surveyed, 73% had recommended ACT in stock and 51% had the capacity to perform parasitological diagnosis (Abdelgader et al, 2012).

In Kenya, a study on the predictors of the quality of health worker treatment practices of uncomplicated malaria indicated that more qualified health workers made

more errors in the management of malaria. Of 1006 consultations observed, 567 children received recommended treatment, 30.4% had minor errors in the treatment while 12.7% received inappropriate treatment. Programmatic interventions such as in-service malaria training, provision of guidelines and wall charts, and more frequent supervision were significantly associated with better treatment quality. Child's age, chief complaint of fever and time of consultation after 1 pm were also associated with treatment quality (Zurovac et al, 2004).

In Uganda, health worker category and patient's main complaint were predictors of malaria treatment. Patients with main complaint of fever were more likely to be treated for malaria (OR = 5.22, 95% CI = 3.61, 7.54) just as patients who were seen by supervised health workers (OR = 1.63, 95% CI = 1.06, 2.50). Patients were less likely to be treated for malaria if more qualified health workers saw them. (OR = 0.61, 95% CI = 0.40, 0.93) (Zurovac, Tibenderana, et al., 2008a). This was also reported in Ghana (QHP, 2008). With regards to paediatric malaria case management, health facility and health worker readiness were variable; 89% of 193 facilities had AL in stock and 1% had AL wall chart. Of the 227 health workers, 55% had access to guidelines while 46% received in-service malaria training. Higher cadre of health worker, in-service training, positive malaria test, complaint of fever and high temperature was associated with better prescribing practices (Zurovac, Njogu, Akhwale, Hamer, & Snow, 2008).

A systematic review by Hensen et al (2011) showed that prescriber practice varied with ACT availability. ACT prescribing was significantly higher in facilities with ACT stock than facilities without ACT stock whilst alternative anti-malarial

prescriptions decreased. The review also showed that ACT was prescribed in the absence of ACT stock indicating that ACT stock alone cannot explain the adherence to treatment guidelines.

In Uganda, Nanyingi (2008) studied the adherence to laboratory findings in the management of malaria and observed that all febrile patients presenting to the study health facilities were given anti-malarials irrespective of whether they had blood test or their test results. For the two districts studied, over 95% were tested for malaria with positive test rates of 52% and 32% respectively. Shortage of laboratory staff, availability of guidelines and training of staff were among the reasons for non-adherence.

Umar and Abdulkareem (2008) studied malaria case management among primary health workers in Sokoto, Nigeria and observed that only 71 (36.4%) of respondents were found to have adequate and effective treatment practices of malaria infection. Contrary to findings in other settings, it was apparent in their analysis that, age, professional cadre and years of experience were not significant predictors of malaria treatment patterns. Albeit a questionnaire-based study of self reported practices, the findings provide some insight into the perceived determinants of effective case management.

A high reported use of ACTs in public health facilities (88.8%) compared to private health facilities (32.4%) was observed in South East Nigeria. This high use especially in the public facilities did not correspond with utilization of laboratory diagnosis. Majority (51.1%) of facilities had used RDTs and only 43.5% were still

using it at the time of the survey with the private clinics being in the minority (42.1%). This reported use of ACTs with limited laboratory diagnosis means the level of inappropriate malaria case management could be high (Uzochukwu, 2010).

Meremikwu et al (2007) reported similar clinician management and prescription practices in both private and public health facilities but observed that documentation of history and physical examination findings was less likely in the private sector compared to the public sector. Overall, only 45% of patients had malaria diagnostic blood slides while only 3% of patients diagnosed with malaria received ACT.

In Kenya, Zurovac (2005) observed that out of the 89% of children who were diagnosed in line with national recommendations, only a little above half (55%) were correctly treated. Assessment and counseling were the weakest tasks in case management even in older children and adults where massive over diagnosis (80%) of malaria was observed. According to Zurovac (2005), though routine microscopy is thought to improve the shortcomings of presumptive diagnosis of malaria, it was characterized by inaccuracies. Ignoring negative malaria test results was observed to be common across all age groups at 67% to 78%.

In Kenya, Juma and Rujovac (2011) assessed health worker case management of malaria three years after implementation of new malaria policy. Significant observations were that AL was prescribed for 63.6% of children under-five years and for 65.0% of patients aged five years and above, while amodiaquine or SP monotherapies were prescribed for only 2.0% of children and 3.9% of older children

and adults. Malaria testing rate was low in all age groups despite age specific recommendations. Disregard for test results was widespread as in the under-five age group; AL was prescribed for 74.7% of test positive, 40.4% of test negative and 60.7% of patients for whom no test was performed. For patients aged five years and above, the findings were similar; 86.7% of test positive, 32.8% of test negative and 58.0% of patients with no test performed were treated with AL.

In a related scenario, where the analysis of the findings were restricted to 64 facilities with malaria diagnostics and AL available on the day of the survey, Zurovac et al (2008) assessed the impact of age specific recommendations on routine malaria treatment. Similar treatment practices were observed in spite of the existing age specific recommendations. They observed that 43.0% of patients aged five years and above and 25.9% of children had parasitological malaria testing of which 87% were by microscopy. Also, AL was prescribed for 79.7% of patients aged five years and above with positive test results, for 9.7% with negative results and for 10.9% without malaria test. For the children, 84.6% with positive tests, 19.2% with negative tests, and 21.6% without malaria test received AL.

In ascertaining the factors that influence community and health worker acceptance and adherence to new malaria treatment guidelines, lack of access to microscopy or distrust in the accuracy of diagnostic tools were cited as reasons attributable to the practice of presumptive treatment of malaria. The acceptability of RDT was also reported as low mainly because of lack of confidence in it (Wijesinghe, Atkinson, Bobogare, Wini, & Whittaker, 2011).

Sarrassat et al (2011) evaluated discrepancies between official guidelines and nurses' malaria case management practices in Senegal and observed that the prescribing practices were fairly in compliance with guidelines. Laboratory confirmation and disregard for negative test result were some of the challenges cited. Among 2, 789 children treated with anti-malarials, 74% received the recommended ACT. However, only 22% of 1, 879 febrile children and 19% of the children diagnosed with malaria had blood smear microscopy. Also, of children with a negative blood smear result, as much as 80% received an anti-malarial. Ambiguous guidelines, health system's dysfunctions and nurses' own considerations were cited as predictors of the observed discrepancies.

A similar study in Malawi observed that 70.8% of children diagnosed with malaria were treated with an effective anti-malarial and the rest were subject to treatment error. Interestingly, this study revealed that neither in-service malaria training nor supervision was associated with treatment quality. Acute respiratory infections training however, was significantly associated with treatment error whereas high fever and chief complaint of fever were associated with fewer errors (AOR = 0.25, 95% CI = 0.10, 0.60 and AOR = 0.25, 95% CI = 0.13, 0.48, respectively). Consultations starting before 1 p.m. were also more likely to be inaccurate (AOR = 1.88, 95% CI = 1.07, 3.31) (Osterholt et al, 2006).

CHAPTER THREE

3. METHODS

3.1 Study Design

A cross sectional health facility survey extracting both qualitative and quantitative data from health facility records and observing patient-health worker consultations was conducted to assess health worker malaria case management. Data on lead health workers involved in malaria case management and their malaria case management practices were also obtained. Available data on logistics and equipment relevant to malaria case management were also collected to assess the health facilities in respect of their malaria case management. Data obtained was analysed using univariate and multivariate methods of analysis to assess malaria case management and prescription practices and determine the factors that influence them.

3.2 Study Area

3.2.1 Demography

The Kwahu South District in the Eastern Region of Ghana was studied. It is located in the North Western part of the Eastern Region between latitude 6° 30' N and 7° N and longitude 0° 30' W and 1° W. It is bounded to the north by Sekyere East district, to the west by Asante Akim South district, to the east by Kwahu West district and to the south by East Akim municipality and Fanteakwa district. The district has a population of 69,757 and covers a total land area of 1,462 km² giving a population density of 48 persons per km². The population is made up of 33, 094 males and 36,663 females giving a sex ratio of 1:1.1. The district population forms 2.6% of the total

regional population (Ghana Statistical Service, 2012b). Women in the reproductive age and children under five years constitute 23,767 and 19,806 respectively.

It is one of the 26 districts and municipalities in the Eastern Region. Administratively, the district is divided into six sub districts namely Asakraka, Bepong, Nkyenenkyene, Kwahu Amanfrom, Kwahu Praso and Mpraeso sub-districts.

3.2.2 Environmental Factors

The Kwahu South District lies within the west semi-equatorial region. It experiences two rainy seasons. The major rainy season starts from April and ends in July while the minor rainy season starts from September and ends in October. Annual rainfall ranges from 1580mm to 1780mm. The district lies within the semi-deciduous forest zone. Majority of the forest has been altered by human activities.

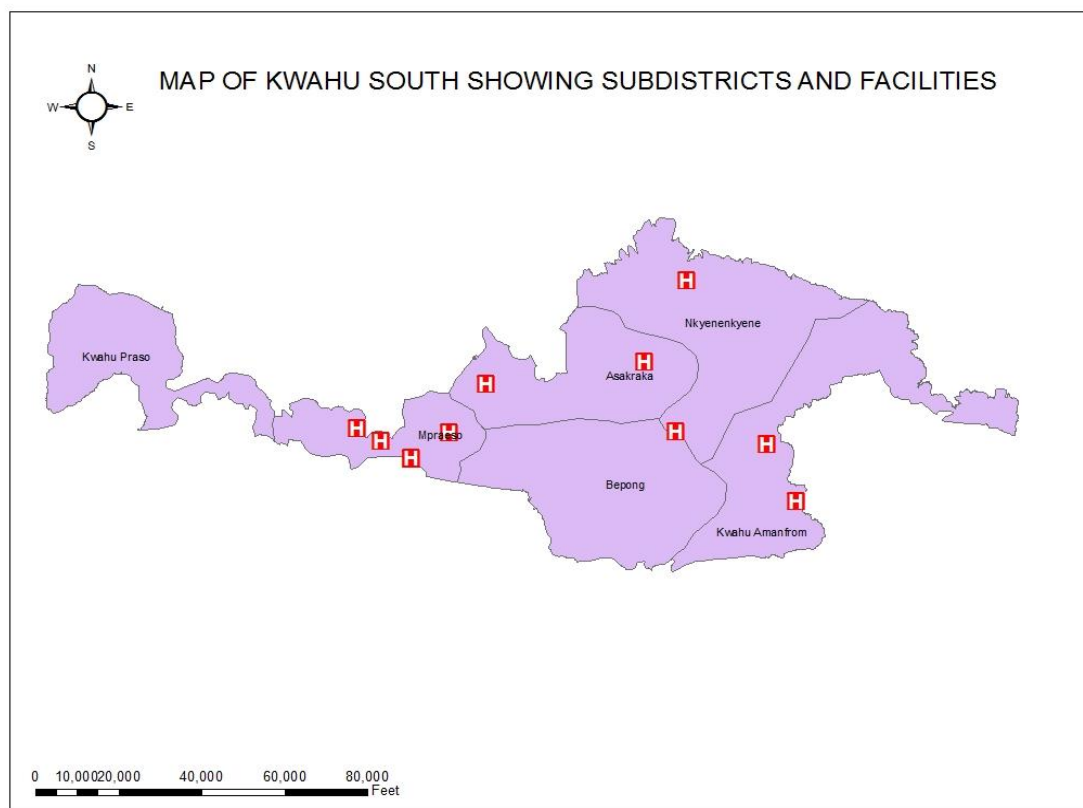
3.2.3 Health Services

The district has eight major health facilities made up of one district hospital, five health centres, one clinic and one private maternity home. In addition, there are nine functional Community-based Health and Planning Services (CHPS) zones, seven of which have designated compounds. The district hospital serves as the referral point for all the other health facilities. Health service in the district is provided by both private and public facilities and Non-Governmental Organisations whose activities are complemented by traditional medical practitioners. Pharmacy shops and licensed chemical sellers play vital roles in the health care delivery.

The levels of health service delivery are:

- Hospital
- Health centres / clinics
- Reproductive and Child Health centres
- Community clinics (CHPS compounds).

Malaria continues to top the list of top ten causes of OPD attendance in the district, contributing 34,085 (34.07%) and 29,847 (30.51%) cases in 2011 and 2012 respectively.



Source: Kwahu South District Health Administration

Figure 3. Map of Kwahu South District showing the main health facilities, 2013

3.3 Variables

The main dependent variable was malaria cases appropriately managed by health workers. The independent variables of interest were varied and included:

1. Health facility variables;

- Availability of anti-malarials
- Availability of guidelines and protocol for malaria treatment
- Availability of key equipment like thermometer, weighing scales, diagnostics
- Staff strength
- Availability of quality assurance activities

2. Health worker variables;

- Performance of assessment tasks (history, examination, laboratory request)
- Prescription practice (type and dosage of drugs, prescription according to test result, prescription according to guidelines)
- Demographics (age, sex)
- Pre-service training
- Length of service (how long health worker has been practicing)
- Exposure to in-service training
- Supervision of health worker
- Possession of guidelines and protocol
- Cadre of health worker (medical officer, nurse etc.)

3. Patient variables

- Age of patient
- Patient symptoms e.g. fever
- Level of education of patient
- Occupation of the patient
- Exposure to prior treatment
- Patient's demand for particular anti-malarials
- Possession of National Health Insurance

3.4 Sampling

3.4.1 Study Population

The study population included the health facilities, the lead health workers involved in outpatient malaria case-management and the health records of patients diagnosed with malaria in the selected sub-districts in the Kwahu South District.

3.4.2 Sample size

Three out of the existing six sub-districts were selected for the study. There were seven public health facilities and 17 chemical distribution outlets in the selected sub-districts and all were included in the study.

In the case of the health workers, all 10 lead health workers who were performing general outpatient consultation in the selected health facilities on the days of visit were included in the study. In addition, 17 shop attendants from the 17 chemical distribution outlets in the selected sub-districts were included.

A sample of 404 health facility records of patients diagnosed with malaria was selected for inclusion in the study. The sample size for the health facility records was calculated as:

The minimum number (n) of records included was determined by:

$$n = \frac{(Z^2 \times P \times (1 - P))}{(d^2)}$$

Where $Z = 1.96$ is the standard score for the confidence interval of 95%

P = proportion of patients managed correctly for malaria in the district

d = allowable error of 5%

Assuming 50% of malaria cases are appropriately managed, (prevalence figure of main outcome of interest)

$$n = \frac{(1.96^2 \times 0.5 \times 0.5)}{(0.05^2)}$$

$$= 384$$

Allowing for loss of information in 5% of the records,

$$n = (0.05 \times 384) + 384$$

$$= 403$$

3.4.3 Sampling method

The Kwahu South District was conveniently selected. At the sub-district level, fifty percent of all the sub-districts were randomly selected to be included in the study. These were Asakraka, Bepong and Mpraeso sub-districts. Each sub-district has at least one public health facility.

Health facilities

In each of the selected sub-districts, all categories of health facilities were included in the study. These included the district hospital, health centres, a clinic, CHPS compounds and private chemical distribution outlets. This is to ensure a fair representation of all facilities providing different levels of care and with different caseloads.

Health workers and patients

At each health facility, a primary sampling unit for the observation part of the study was a health worker-patient consultation. Health workers performing general outpatient consultation were eligible for inclusion. All eligible health workers were included. Any patient aged 2 months and above presenting for an initial visit with fever (by history or measured axillary temperature of ≥ 37.5 °C) to a health facility was eligible for inclusion in the study. The first seven sampling units that met the inclusion criteria were selected at each health facility. This was based on the assumption that the pattern in which patients arrived at a health facility was not associated with quality of care they received. The selection of seven consultations for observation was based on the Lots Quality Assurance Sampling (LQAS) technique,

which is based on the binomial probabilities. The LQAS assumes that health workers should deliver services using the correct technique at least 95 percent of the time. Using the binomial equation, at least six observations per health worker are needed to determine this skill level. We observed seven outpatient consultations per health worker.

In the case of children, if more than one child per caretaker presented, one was selected at random for inclusion. The other children were excluded from the study and the next patient who met the inclusion criteria was sampled. Patients less than two months old, seriously ill patients, patients attending the health facility for follow up, patients whose presenting complaints qualified them for specialised care and patients attending the health facility for chronic illnesses were excluded from the study. Patients who were coming for a follow-up on initial fever or malaria treatment were excluded to ensure the findings better represent initial malaria case management practice. Patients less than two months old were also excluded because fever in patients less than two months old was less likely to be due to malaria. All the lead health workers attending to the patients were included in the study, for observation of their consultations and interview.

Chemical shop attendants

We interviewed 14 attendants from 14 chemical distribution outlets in the selected sub-districts. Three of the shops were closed during the survey period. All the attendants at the chemical shops visited consented to be part of the study. In cases where there were more than one attendant in a shop, only one was selected at random

and interviewed.

Patients' health records

A total of 404 health records of patients diagnosed with malaria were selected from all the seven health facilities for review. This was allocated proportionately to the health facilities based on their malaria caseloads for the preceding year. The malaria caseload for the preceding year and number of health records apportioned to each health facility was used to determine the sampling interval “*i*” for the selection of the records. The total number of health records per each health facility was selected by systematic random sampling using the sampling interval “*i*”.

Table 1 shows the distribution of the patients' health records by health facilities.

Table 1. Number of patients' records reviewed by health facility, Kwahu South District, 2013

| Facility | Malaria case load (m) | Proportion of Malaria case load (m/T) | Calculated Sample size (m/T) x n | Allocated Sample size |
|-----------------|------------------------------|--|---|------------------------------|
| Asakraka | 4,601 | 0.15 | 62.12 | 62 |
| Bepong | 2,429 | 0.08 | 32.80 | 33 |
| Hospital | 18,697 | 0.63 | 252.45 | 252 |
| Ntomem | 409 | 0.01 | 5.52 | 6 |
| Obo | 1,390 | 0.05 | 18.77 | 19 |
| Obomeng | 2,044 | 0.07 | 27.60 | 28 |
| Twenedurase | 277 | 0.01 | 3.74 | 4 |
| Total | T = 29,847 | 1.00 | n =403 | 404 |

T = Total outpatient malaria case load for the year 2012

n = Calculated sample size

m = Malaria case load per facility for the year 2012.

3.5 Data collection technique and tools

Four methods were used in collecting data. These include:

1. Observation of consultations with a Patient Observation Checklist: A standardized checklist was used to capture the assessment tasks performed by the health worker through a non-participatory observation of the health worker-patient interaction.

2. Assessment of health facilities including chemical distribution outlets using a Health Facility Audit Questionnaire: General issues pertinent to malaria case management such as staffing, availability of standard guidelines, logistics and equipment as well as some service delivery practices was assessed. Practices of chemical distribution outlet attendants were also assessed. One questionnaire per facility was filled.

3. Interview of health workers using a Health Worker Interview Questionnaire: Health workers performing outpatient consultations and who were observed during the time of the survey were interviewed. The questionnaire assessed knowledge and management practices as well as training, supervision and work experience.

4. Health facility records review was done using a checklist: The health facility records of patients who had been managed for malaria in the past year were reviewed for information on documentation of assessment tasks, diagnoses, treatment and dosages of drugs.

3.5.1 Ethical clearance

Ethical approval was sought from the Ethical Review Committee of the Ghana Health Service. Permission was also sought from the Eastern Regional Health Directorate, Kwahu South District Health Directorate and the in-charges of the various health facilities included in the study. Informed consent was obtained from the health workers, patients and their caretakers and confidentiality assured before the study. They were fully informed about the purpose, procedures, risks and benefits of participating in the study. For participants who could not read, the consent form was read and explained to them in the presence of an impartial witness. Participants who agreed to be part of the study were required to sign or thumbprint the consent form as an indication of their willingness to participate. Assent was obtained from older children.

All the information obtained from this study was kept confidential and used for the purpose indicated for the study. The information was securely stored without the names of the participants, in a file, which was only accessible to the research team. Observation of consultation and extraction of data from patients' records were done only by trained health professionals including the principal investigator who have experience in the care and management of patients and their information. Only health workers and patients who agreed were observed.

There was no risk involved in participating in this study. The participants were however informed of possible minor discomforts in answering certain questions for which they may choose not to answer. Participants were informed that participation in the study was voluntary and they may withdraw from the study at any time without

attracting any penalty. Participants were not coerced into taking part in the study and there was no direct benefit or compensation for participation.

3.5.2 Training of interviewers

The field workers were trained a week prior to the commencement of the data collection. The training focused on ensuring that the field workers understood the objectives of the survey, were familiar with the survey tools and their interpretation, and were able to perform the survey tasks. Simulated practices were repeated to increase the agreement and consistency between field workers and the trainer.

3.5.3 Pre-testing and review of data collection tools

The data collection tools were pre-tested at Kibi Government Hospital and a private chemical shop both in the East Akim Municipality, which have similar settings as the facilities in the Kwahu South District. The tools were pre-tested in order to ensure they reflected the local conditions, and that the questions were clear and well understood by the respondents as well as making sure that the tools were well formatted. The necessary modifications were made based on the pre-test.

3.5.4 Data collection

We conducted the survey from the 18th of April to 17th of May 2013. All the seven public health facilities from the selected sub-districts were visited. However, one CHPS compound, Twenedurase CHPS compound, located in the Mpraeso sub-district was excluded from the observation part of the study on account of small caseload of less than one patient per day. This facility has temporarily stopped attending to patients on the National Health Insurance Scheme (NHIS) as a result of unresolved

administrative issues. The trained survey team visited the remaining six health facilities early in the mornings of selected days of the week. The team introduced its members to the health facility in-charges and sought permission for the commencement of the study. Verbal consent was sought from the in-charges of all the health facilities as well as the various heads of the departments involved in the study.

Patients arriving at the facility were recruited based on the inclusion criteria and their willingness to be part of the study. All the 10 health workers who performed outpatient consultations in the various health facilities were eligible for having their consultations observed. They were enrolled in the study for the observation process after seeking their informed consent.

Patients and caretakers who agreed to be part of the survey were recruited at the history table and given identification before they entered the consulting rooms. During the consultation process, an independent observer observed and recorded all the assessment tasks performed, the diagnoses and the medications prescribed without participating in the interaction between the health worker and the patient. In cases where the observer was unable to read directly from the record, the health worker was asked about the diagnoses and the medications prescribed. This process was repeated for the other six patients per health worker recruited into the study. After the observation, the health worker was interviewed either immediately or at the end of the entire consultation. Assessment of the health facility for facilities and logistics relevant to malaria case management was done with the Facility Audit Questionnaire. The respondents included the in-charges of the various facilities and other members of staff who could adequately provide information on key aspects of the facility and the

services provided.

We selected the patients' health records from the consulting room registers. The malaria caseload for the preceding year was obtained from the health facility record and used to determine the sampling interval "i" for the patients' health record to be reviewed. Simple random sampling was used to determine the first record to be selected and thereafter, each "i"th record was selected until the required number of records per facility was obtained. The selected records were identified using the record identification numbers extracted from the consulting room register. The record identification numbers were then used to trace and retrieve the records from the records department. Documented assessment tasks, diagnoses, medications and their dosages were extracted from the selected records.

At the chemical distribution outlets, the team introduced its members to the attendants and obtained permission to undertake the study in their facilities. One attendant per each shop was interviewed on availability of drugs, assessment tasks and treatment practices as well as training.

3.5.5 Quality control

Field workers with experience in the health sector or some health training were used in the data collection to ensure quality data collection. The field workers were trained and assessed to ensure they had the ability to accurately observe consultations or record study participants' actions and responses. During the data collection, the principal investigator supervised the field workers and data collected was randomly crosschecked from the participants for correctness. Double entry of data into Epi info

software version 3.5.3 was done by two independent data entry clerks. Discrepancies were resolved by referring to the original data collection tools. Data validation was ensured during the data entry process by using validation programs whilst creating the data entry template.

3.6 Data processing and analysis

3.6.1 Data processing

Two independent data entry clerks did double entry of the data into Epi info software version 3.5.3. Data cleaning and verification was done to ensure good quality data. For each variable on which analysis was done, the frequencies were run to identify the number of missing variables and incorrectly entered data. Analyses were done on variables for which data was entered. Missing data was excluded from the analyses when necessary. Where an input was to be corrected, the variables were listed with the “allow update” function enabled and the necessary corrections done.

3.6.2 Data analysis

We performed univariate analysis, bivariate analysis and developed a multivariate logistic regression model each for appropriate treatment of malaria as well as prescription of recommended AA, adjusting for independent variables considered as potential confounders. A probability level of 5% was used as statistically significant.

Descriptive Statistics: Descriptive data analysis was done using frequencies and cross tabulations. Univariate analysis of categorical variables was expressed in the form of frequencies, proportions and percentages. Appropriate measures of central tendency and dispersion were calculated.

Inferential Statistics: Bivariate analysis was done using unadjusted odds ratio and their corresponding 95% confidence interval to assess association between selected independent variables such as patient, health worker and health facility variables and appropriateness of malaria treatment. The unadjusted odds ratios with associated p-values were calculated for each predictor variable. Variables found significant ($p\text{-value} < 0.05$) were identified and used in a multivariate analysis.

In the multivariate analysis, logistic regression modeling (using adjusted odds ratio) was used to assess the strength of association between factors predictive of malaria being treated appropriately and appropriate malaria treatment. The outcome variable was whether a patient was managed appropriately (Yes/No). Explanatory variables were selected patient, health worker and facility variables that were significantly associated with appropriateness of malaria treatment in the bivariate model. Predictors independently associated with malaria being managed appropriately ($p\text{-value} < 0.05$) were maintained in the model.

We developed another logistic regression model to explore which explanatory variables were significantly associated with being prescribed the recommended first line AA. The outcome variable was whether a patient was prescribed the recommended first line AA (Yes/No). The explanatory variables that were significantly associated with being prescribed the recommended AA ($p\text{-value} < 0.05$) at bivariate analysis were used. Factors independently associated with being prescribed the recommended first line AA were then identified.

CHAPTER FOUR

4. RESULTS

4.1 Characteristics of study population

4.1.1 Health facility characteristics

Of the seven health facilities, one (14.3%) was a hospital, three (42.9%) health centres, one (14.3%) clinic and three (42.9%) CHPS compounds. Four (57.1%) of the health facilities were located in the Mpraeso sub-district. The Bepong and Asakraka sub-districts had two (28.6%) and one (14.3%) respectively. Only the Mpraeso sub-district had all the different categories of health facilities (Table 2).

Table 2. Categories of health facilities by sub-district, Kwahu South District, 2013

| Sub-district | Health Facility type | | | | Total |
|--------------|----------------------|---------------|--------|---------------|-------|
| | Hospital | Health Centre | Clinic | CHPS Compound | |
| Asakraka | 0 | 1 | 0 | 0 | 1 |
| Bepong | 0 | 1 | 0 | 1 | 2 |
| Mpraeso | 1 | 1 | 1 | 1 | 4 |
| Total | 1 | 3 | 1 | 2 | 7 |

From the health facility assessment, only three of the health facilities namely the Kwahu Government Hospital, Asakraka health centre and Ntomem CHPS compound demonstrated evidence of the existence of quality assurance systems in

place. None of the facilities recorded stock out of either AA or AL in the past six months. All the six facilities had supervisors visiting in the last six months. Both adult and paediatric weighing scales as well as standard treatment guidelines were present in all the six health facilities. Treatment charts were present in the consulting rooms of four health facilities (Table 3).

Table 3. Facility level indicators for malaria case management, Kwahu South District, 2013

| Indicator | Number of facilities | Percentage |
|--|-----------------------------|-------------------|
| Availability of weighing scales (Adults) | 6 | 100.0 |
| Availability of weighing scales (Paediatrics) | 6 | 100.0 |
| Availability of standard treatment guidelines | 6 | 100.0 |
| Availability of treatment charts in consulting rooms | 4 | 66.7 |
| Supervisory visit in last 6 months | 6 | 100.0 |
| Availability of functional quality assurance system | 3 | 50.0 |
| Stock out of anti-malarials in last 6 months | 0 | 0.0 |

All the 14 outlets had at least one type of ACT in stock. Only one (7.1%) of these did not have the “ACT with the green leaf” which is the subsidized ACT (called “co-paid”) provided through the Affordable Medicines Facility-malaria (AMFm) initiative (Table 4).

Table 4. Availability and stock out of anti-malarials at chemical distribution outlets, Kwahu South District, 2013

| Drug | Number (%) with drug | Number (%) with stock |
|-------------|----------------------|-----------------------|
| | available | out in last 6 months |
| AA | 12 (85.7) | 3 (21.4) |
| Artesunate | 0 (0.0) | 1 (7.1) |
| Amodiaquine | 2 (14.3) | 0 (0.0) |
| AL | 14 (100.0) | 3 (21.4) |
| SP | 9 (64.3) | 0 (0.0) |
| Alaxin | 11 (78.6) | 3 (21.4) |
| DP | 2 (14.3) | 0 (0.0) |
| Quinine | 1 (7.1) | 0 (0.0) |
| *Others | 8 (57.1) | 0 (0.0) |

*Other refers to “Masada malaria syrup”, n = 8; “malacure”, n = 2; “malaherb”, n=1

4.1.2 Health worker characteristics

None of the 10 health workers refused to participate in the study. All 10 were observed and interviewed. Two (20.0%) of the health workers were medical officers; three (30.0%) were medical assistants and the rest, various categories of nurses. Four (40.0%) were females. Two (20.0%) of the health workers did not have any formal training in malaria case management and of the eight who received formal training, none was trained in the last six months.

Out of the 14 attendants of the chemical distribution outlets, six (42.9%) were females and only 12 (85.7%) had been trained on malaria case management. However, of those who had ever been trained, only three (25.0%) were trained within the last six months. These comprised one (8.3%) from Asakraka sub-district and two (16.7%) from Mpraeso sub-district. Table 5 below summarises the characteristics of the attendants by sub-districts.

Table 5. Characteristics of chemical shop attendants by sub-district, Kwahu South District, 2013

| Characteristics of attendants | | Sub-district | | | Overall |
|-------------------------------|--------|--------------|-----------|------------|-----------|
| | | Asakraka | Bepong | Mpraeso | |
| | | n (%) | n (%) | n (%) | n (%) |
| Sex | Female | 2 (66.7) | 1 (100.0) | 3 (30.0) | 6 (42.9) |
| | Male | 1 (33.3) | 0 (0.0) | 7 (70.0) | 8 (57.1) |
| Trained | Ever | 2 (66.7) | 1 (100.0) | 9 (90.0) | 12 (85.7) |
| | Never | 1 (33.3) | 0 (0.0) | 1 (10.0) | 2 (14.3) |
| Total | | 3 (100.0) | 1 (100.0) | 10 (100.0) | 14 (100) |

Of the respondents from the chemical distribution outlets, 10 (71.4%) were licensed chemical sellers (LCS), three (14.3%) were nurses and one (7.1%) a pharmacy attendant. One (7.1%) of the respondents had no formal health training. He was a relative of the owner of the chemical shop who was unavailable at the time.

4.1.3 Patient characteristics

Out of the 70 clinical observations, 40 (57.1%) were females and 16 (22.9%) were below five years. The median age of the patients was 18 years (interquartile range; 5-33). Table 6 shows the age and sex distribution of the patients in the clinical observation by type of health facility.

Table 6. Distribution of patients in clinical observation sample by age, sex, and type of health facility, Kwahu South District, 2013

| Patient Characteristics | | Health Facility Type | | | | Overall |
|-------------------------|------------|----------------------|---------------|-----------|-----------|------------|
| | | Hospital | Health Centre | Clinic | CHPS | |
| | | n (%) | n (%) | n (%) | n (%) | n (%) |
| Sex | Female | 18 (51.4) | 16 (76.2) | 4 (51.7) | 2 (28.6) | 40 (57.1) |
| | Male | 17 (48.6) | 5 (23.8) | 3 (42.9) | 5 (71.4) | 30 (42.9) |
| Age | 0-4 years | 3 (8.6) | 7 (33.3) | 4 (57.1) | 2 (28.6) | 16 (22.9) |
| | 5-12 years | 7 (20.0) | 2 (9.5) | 0 (0.0) | 4 (57.1) | 13 (18.6) |
| | >12 years | 25 (71.4) | 12 (57.1) | 3 (42.9) | 1 (14.3) | 41 (58.6) |
| Total | | 35 (100.0) | 21 (100.0) | 7 (100.0) | 7 (100.0) | 70 (100.0) |

Most 287 (71.0%) of the records bore the ages of 12 years and above and majority 247 (61.1%) were those of females. The records for patients under five years old were 44 (12.8%). The median age of patients from the records review sample was 23 years (interquartile range; 12-38). There were eight (2.0%) records (seven from the health centre category and one from the clinic category) for which age of the patient was not provided (Table 7).

Table 7. Distribution of patients in records review sample by age, sex, and type of health facility, Kwahu South District, 2012

| Patient Characteristics | | Health Facility Type | | | | Overall |
|-------------------------|------------|----------------------|---------------|------------|------------|-------------|
| | | Hospital | Health Centre | Clinic | CHPS | |
| | | n (%) | n (%) | n (%) | n (%) | n (%) |
| Sex | Female | 156 (61.9) | 66 (57.9) | 18 (64.3) | 7 (70.0) | 247 (61.1) |
| | Male | 96 (38.1) | 48 (42.1) | 10 (35.7) | 3 (30.0) | 157 (38.9) |
| Age | 0-4 years | 21 (8.3) | 23 (20.2) | 0 (0.0) | 0 (0.0) | 44 (10.9) |
| | 5-12 years | 34 (13.5) | 20 (17.5) | 10 (35.7) | 1 (10.0) | 65 (16.1) |
| | >12 years | 197 (78.2) | 64 (56.1) | 17 (60.7) | 9 (90.0) | 287 (71.0) |
| | Missing | 0 (0.0) | 7 (6.1) | 1 (3.6) | 0 (0.0) | 8 (2.0) |
| Total | | 252 (100.0) | 114 (100.0) | 28 (100.0) | 10 (100.0) | 404 (100.0) |

Majority 147 (42.6%) of the records were those of students and pupils followed by those of traders 69 (20.0%). Children under five, considered pre-school children, were 44 (10.9%). There were 59 (14.6%) records in which the occupation was not recorded. These were excluded from this analysis in Figure 4.

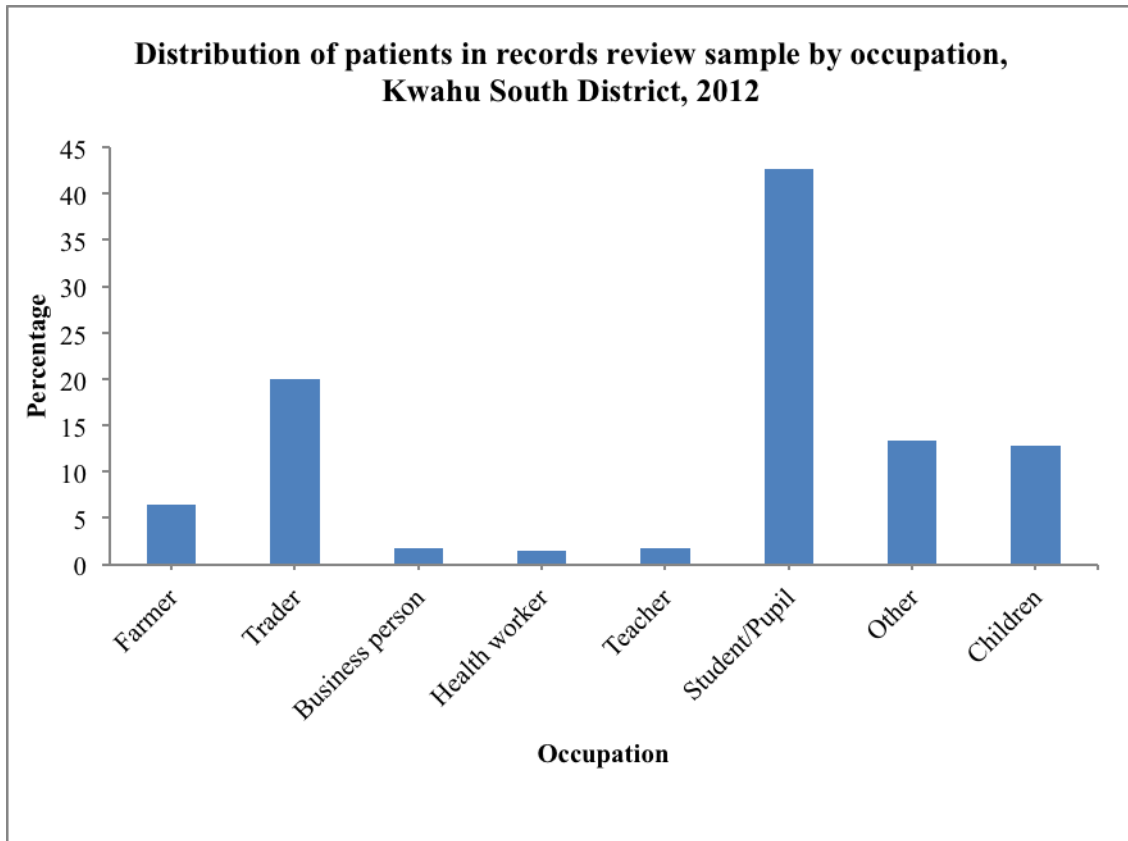


Figure 4. Distribution of patients in records review sample by occupation, Kwahu South District, 2012

4.2 Case management practices

4.2.1 Performance of assessment tasks

Most of the records especially from lower health facilities did not have comprehensive documentation of assessment tasks. However, from observation, almost all the health workers performed basic assessment tasks some of which were not recorded in the patients' health records. Only three (18.8%) of the patients under five years old were examined for other non-malarial causes of fever.

From the observation, all those who tested positive for malaria in each of the health facilities were appropriately treated with ACTs. Overall, as many as 63 (90.0%)

of the patients from the clinical observation sample were tested for malaria: 32 (50.8%) by RDT and 31 (49.2%) by blood film for malaria parasites. Of these, 33 (52.4%) were confirmed positive for malaria. Though all the confirmed cases were treated with ACTs, only 12 (36.4%) of them received AA (Figure 5). In all, 53 (75.7%) patients from the observation sample including all 33 test positive cases and 20 (66.7%) of the test negative cases were treated according to test results.

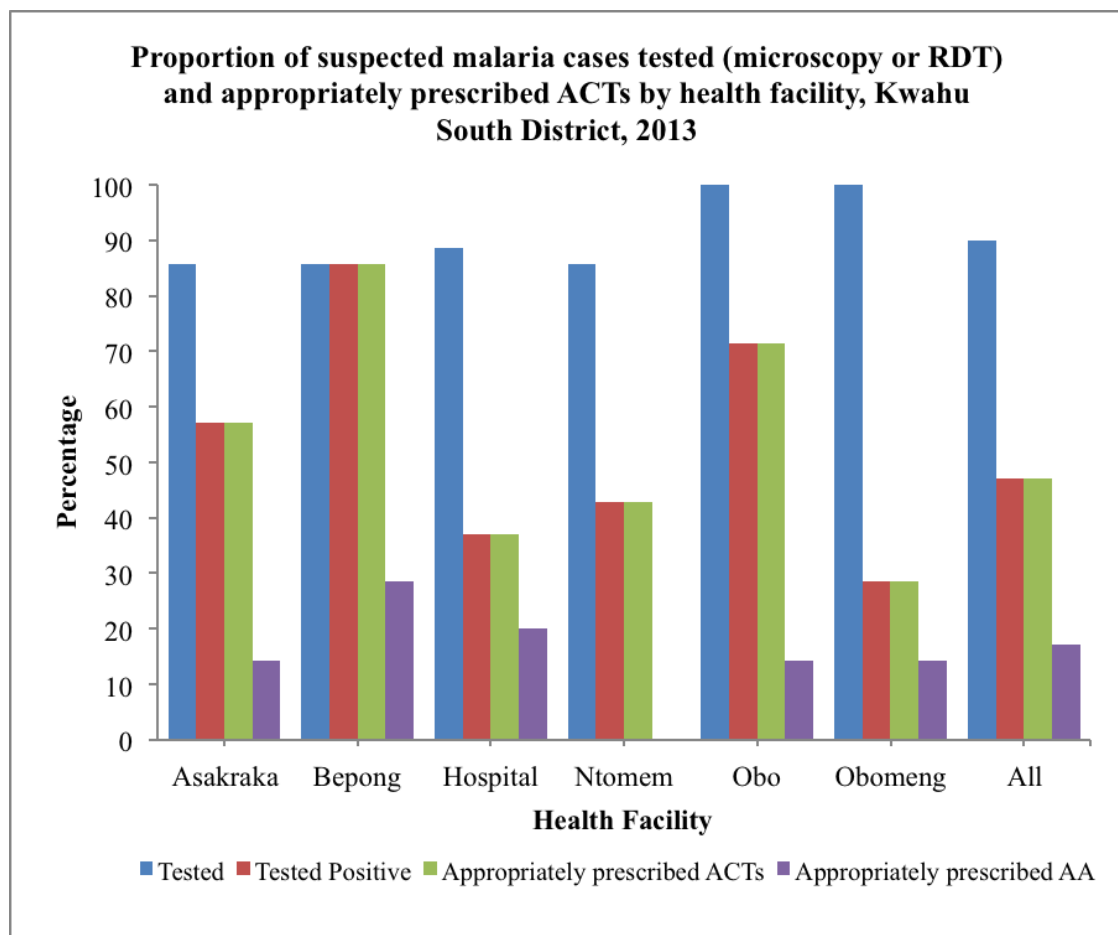


Figure 5. Proportion of suspected malaria cases tested (microscopy or RDT) and appropriately prescribed ACTs by health facility, Kwahu South District, 2013

From the records review sample, the history taken was inadequate in most instances. The duration of the symptoms were recorded in 279 (69.1%) of instances. Physical examination was recorded in only the records obtained from the hospital. At least one sign was recorded in 147 (36.4%) of the records. Out of the 44 children under five years, 14 (31.8%) of them had at least one physical sign recorded in their records.

The diagnostic laboratory tests that were done were RDT in the health centres, clinic and CHPS compounds as well as blood film for malaria parasites in the hospital. Laboratory test was requested for 206 (51.0%) patients. Presumptive diagnosis of malaria was done in the rest of the patients since every patient included in this sample was diagnosed and treated for malaria. Of those who had presumptive diagnosis of malaria, 20 (10.1%) were less than five years old. Disregard for negative test results was observed only in the hospital and the Twenedurase health facilities at 96 (55.2%) and one (25.0%) respectively. The majority 336 (83.2%) of the records that were reviewed were for patients with a single diagnosis of uncomplicated malaria. Very few 67 (16.6%) had malaria diagnosis with at least one additional diagnosis. Only one (0.2%) of the records did not have the diagnosis recorded.

Out of the 404 records reviewed, 206 (51.0%) had diagnostic tests recorded and 105 (51.0%) of these were recorded to have tested positive. Appropriate prescription of ACTs occurred in 101 (96.2%) of the confirmed cases, with compliance with AA prescription being 57.4%. Except for four (5.3%) confirmed malaria patients and one test negative patient from the hospital who were given Quinine as a result of malaria in first trimester pregnancy, all the patients who tested positive for malaria in the other facilities appropriately received ACTs (Figure 6). In all, 105 (26.0%) patients

from the records review sample including all 105 confirmed malaria patients and none of the test negative patients were treated according to test results.

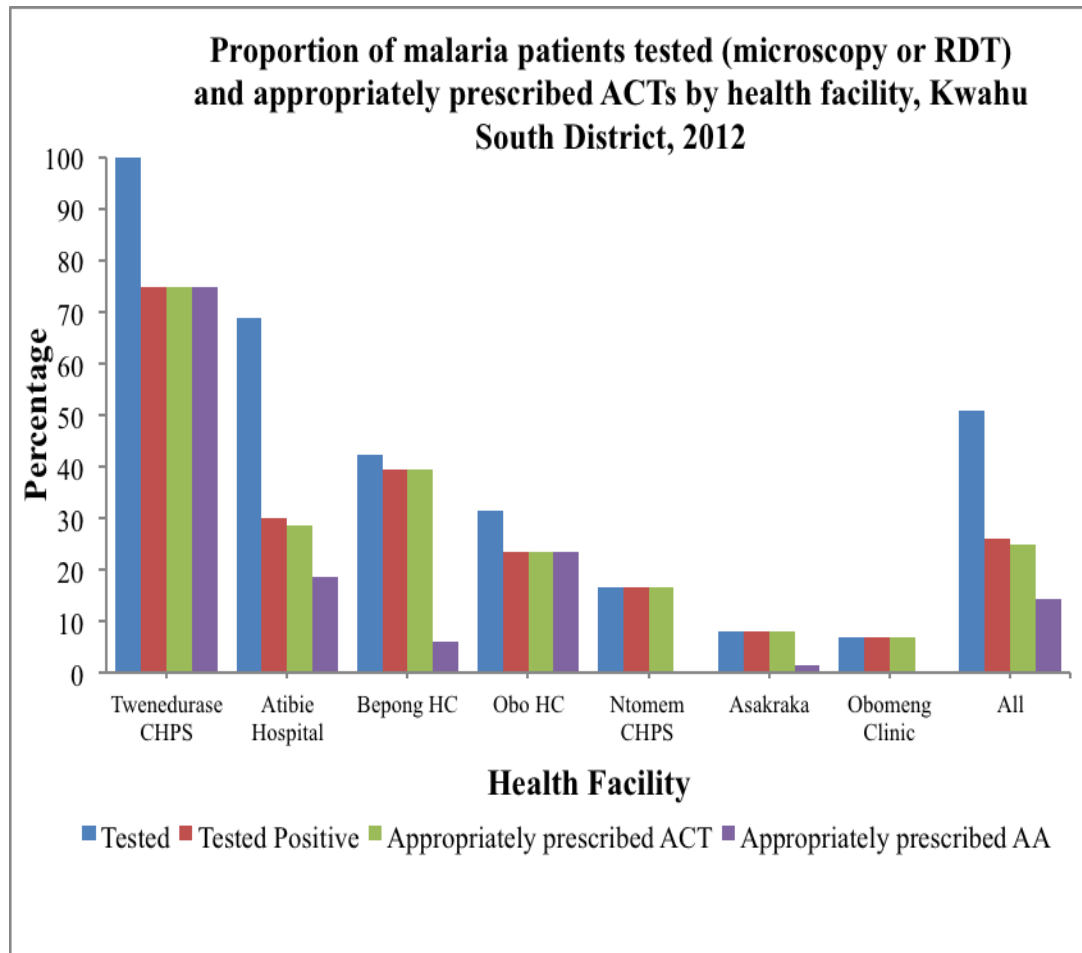


Figure 6. Proportion of malaria patients tested (microscopy or RDT) and appropriately prescribed ACTs by health facility, Kwahu South District, 2012

All the respondents from the chemical distribution outlets diagnosed malaria in their clients mostly using the clinical symptoms. Only two shops performed laboratory tests. One facility, which operated as a diagnostic centre performed blood film examination for malaria parasites and another shop also performed RDT.

Counseling was provided for some of the patients observed but this task could not be assessed for samples included in the records review. There was no documentation of counseling messages in any of the records reviewed.

Table 8 summarises the proportion of patients observed to have been provided with each of the different categories of counseling instructions by their respective health workers. The analysis included all the suspected malaria cases observed irrespective of their final diagnosis. All the observed patients had either a recent history of fever or measured fever and received at least one medication and were therefore included in the sample. The dosage regimen of the medications supplied was the most frequently provided counseling instruction observed in 24 (34.3%) cases. Telling patients or their caregivers the diagnoses was the next most frequently provided to 15 (21.4%) patients. Counseling on use of ITN, facility re-engagement instructions, instructions on home management of fever, and dietary advice were provided in 14 (20.0%), six (8.6%), six (8.6%) and five (7.1%) instances respectively.

Table 8. Observed provision of counseling to suspected malaria patients by health workers, Kwahu South District, 2013

| Counseling Instruction | N | Provided (%) | (95% CI) |
|----------------------------------|----|--------------|--------------|
| Tell diagnosis | 70 | 21.4 | (12.5, 32.9) |
| Explain home management of fever | 70 | 8.6 | (3.2, 17.7) |
| Give dietary instructions | 70 | 7.1 | (2.4, 15.9) |
| ITN use | 70 | 20.0 | (11.4, 31.3) |
| Health facility re-engagement | 70 | 8.6 | (3.2, 17.7) |
| Dosage/ regimen of medications | 70 | 34.3 | (23.3, 46.6) |

Of the 10 health workers, nine (90%) said they routinely counsel their patients with malaria. However, from the observation, only 45 (64.3%) had at least one counseling message (Figure 7).

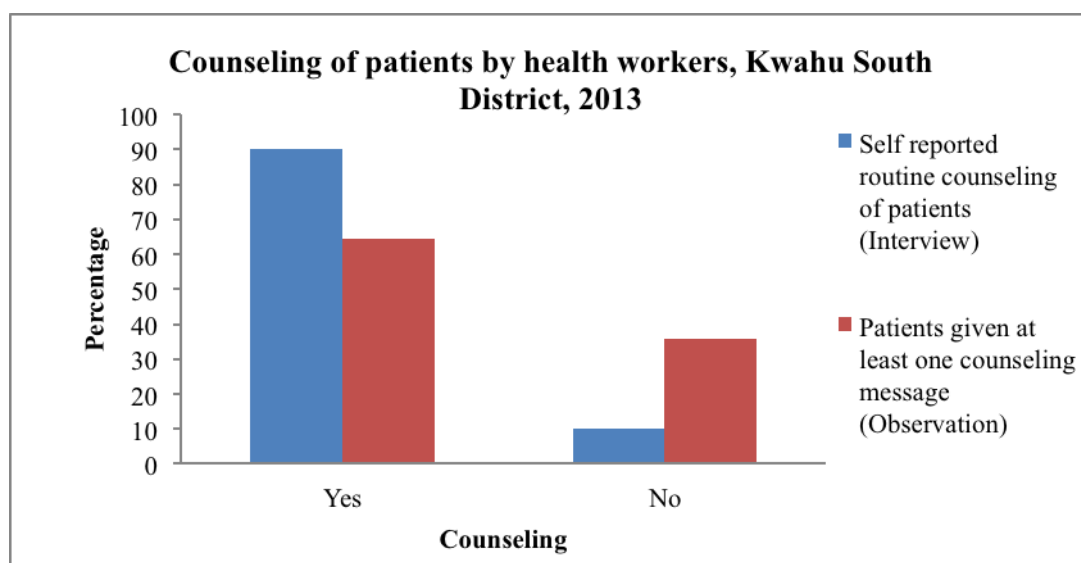


Figure 7. Counseling of patients by health workers, Kwahu South District, 2013

Twelve of the respondents from the chemical distribution outlets said they routinely counseled their clients with malaria. All the 12 of them who counseled their clients mentioned prevention strategies, six (50.0%) mentioned dosage and regimen of drugs, one (8.3%) mentioned the diagnosis as issues they counseled their clients on. None mentioned follow up.

4.3 Health worker prescription practices

Among the observation sample, only two (2.9%) of the suspected malaria patients were diagnosed presumptively and treated for malaria. Of 30 patients who tested negative for malaria, 10 (33.3%) were treated for malaria. The disregard for the negative test result was more frequent in the hospital than the other two facilities: Obomeng clinic and Asakraka health centre which recorded one each. All 33 patients who tested positive for malaria were given anti-malarials.

Overall, 449 (94.7%) patients were given anti-malarials including all the 404 patients from the records review sample and 45 (64.3%) from the observation sample. Of these, only six (1.3%) did not receive ACTs. Majority 33 (73.3%) of the 45 patients from the observation sample who were treated with ACTs, received AL. The remaining 12 (26.7%) received AA. From the records reviewed, AL was the most prescribed anti-malarial for 266 (65.8%) patients with malaria. AA was prescribed for 132 (32.7%) patients whilst Quinine was prescribed for five (1.2%) patients who had malaria in their first trimester pregnancies (Table 9). Only one (0.2%) patient was given artesunate monotherapy in the form of suppository. In all, 398 (98.5%) patients from the records review sample were treated with ACTs with only 132 (33.2%) receiving AA.

Of the 206 patients for whom laboratory test was requested, 97 (47.1%) tested negative for malaria but were still diagnosed as malaria and treated with anti-malarials. In four (1.9%) of the records of those tested, the test result was not recorded.

Table 9. Health workers' compliance with ACT use, by data collection method, Kwahu South District, 2012, 2013

| Data collection method | Number given recommended anti-malarials | | |
|--------------------------|---|------------|-------------|
| | AA (%) | AL (%) | Quinine (%) |
| Observation (n = 43)* | 12 (26.7) | 31 (73.3) | 0 (0.0) |
| Records review (n = 404) | 132 (32.7) | 266 (65.8) | 5 (1.2) |
| Total (n = 447) | 144 (32.2) | 297 (66.4) | 5 (1.1) |

* Only 45 out of the 70 suspected malaria patients were given anti-malarials

Each patient in both the records review and observation samples was given at least two drugs. As many as 173 (42.8%) patients from the records review sample, received prescriptions covering more than four drugs. For the observation sample, only 12 (17.1%) received more than four drugs. Four drugs were prescribed for 101 (25.0%) and 22 (31.4%) of the patients in the records review and observation samples respectively (Figure 8).

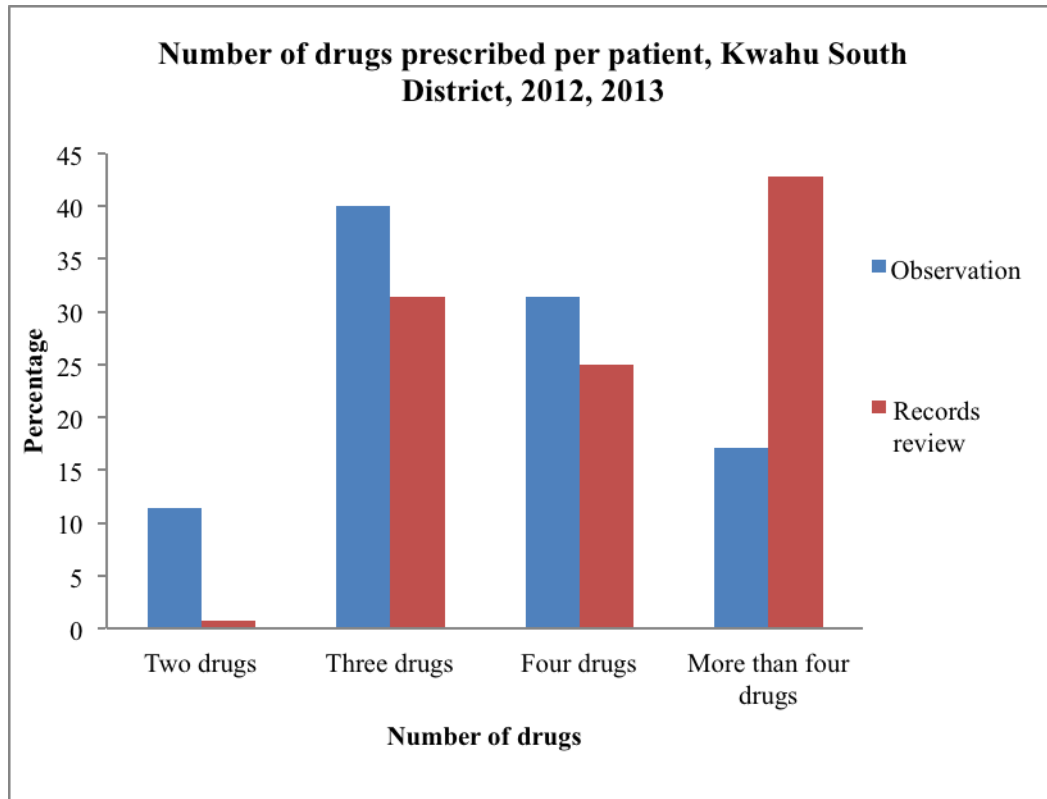


Figure 8. Number of drugs prescribed per patient in the records review sample, Kwahu South District, 2012

The average number of medications given per patient in the observation sample was 3.6 (standard deviation ± 1.1). Table 10 summarises the number of drugs per patient in the records review sample by health facility.

Table 10. Number of drugs per patient in records review sample, by health facility, Kwahu South District, 2012

| Facility | Number of drugs per patient | | | |
|-------------|-----------------------------|----------------|---------------|-------------------------|
| | Two n (%) | Three n (%) | Four n (%) | More than four n (%) |
| Asakraka | 0 (0.0) | 2 (1.6) | 25(24.7) | 35 (20.2) |
| Bepong | 0 (0.0) | 7 (5.5) | 15 (14.9) | 11 (6.4) |
| Hospital | 2 (66.7) | 93 (73.2) | 51 (50.5) | 106 (61.3) |
| Ntomem | 1 (33.3) | 1 (0.8) | 2 (2.0) | 2 (1.2) |
| Obo | 0 (0.0) | 2 (1.6) | 6 (5.9) | 11 (6.3) |
| Obomeng | 0 (0.0) | 20 (15.7) | 1 (1.0) | 7 (4.0) |
| Twenedurase | 0 (0.0) | 2 (1.6) | 1 (1.0) | 1 (0.6) |

Appropriate decision to prescribe anti-malarials (those who were both tested and treated according to test results) occurred in 53 (75.7%) in the observation sample and 105 (26.0%) in the records review sample. Overall, 158 (33.3%) of patients met this criterion.

Frequently prescribed anti-malarials by chemical shop attendants to their clients for treating uncomplicated malaria were AL, AA, Alaxin and SP. Majority, 13 (92.9%) of the chemical shop attendants said they prescribed AL followed by 10 (71.4%) who mentioned AA. As many as five (35.7%) mentioned Alaxin and SP (Figure 9).

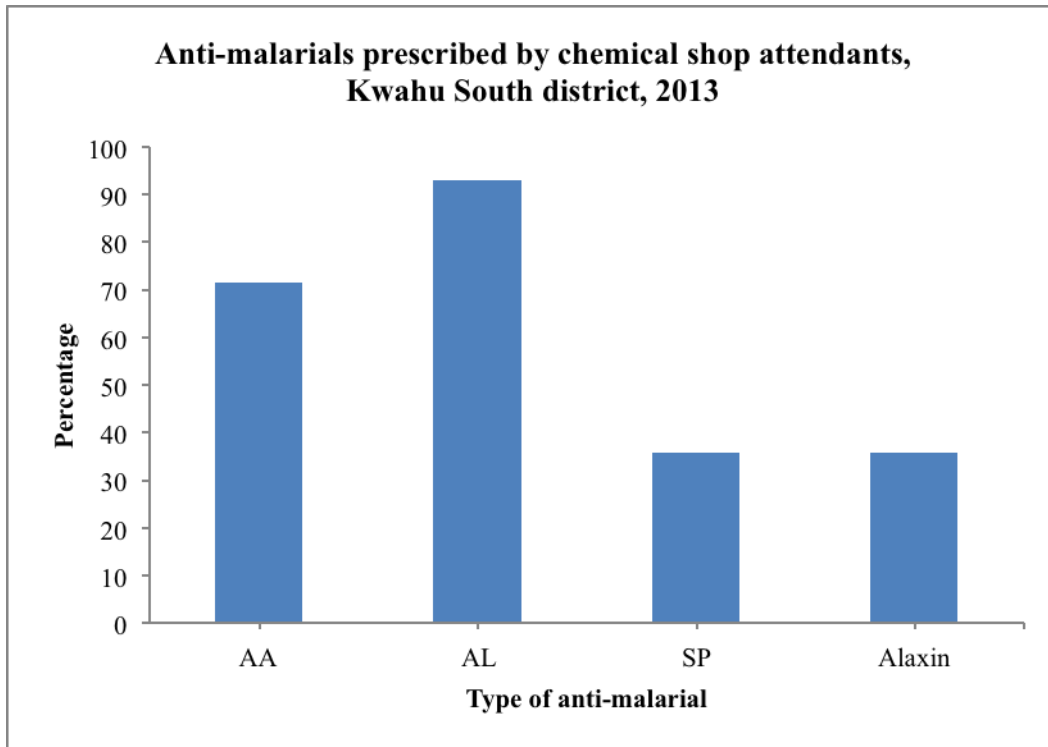


Figure 9. Anti-malarials prescribed by chemical shop attendants, Kwahu South District, 2013

Patients' preference dominated as the reason for prescribing other anti-malarials other than the recommended first line AA combination. This was mentioned by 11 (78.6%) of the attendants followed by attendants' personal choice and fear of adverse reaction, mentioned by seven (50.0%) and five (35.7%) attendants respectively. Stock out of AA was also mentioned by five (35.7%) of the attendants. Though all but one of the chemical supply outlets had the AMFm initiative's highly subsidized ACT, two (14.3%) mentioned cost as a reason for prescribing other anti-malarials apart from AA (Figure 10).

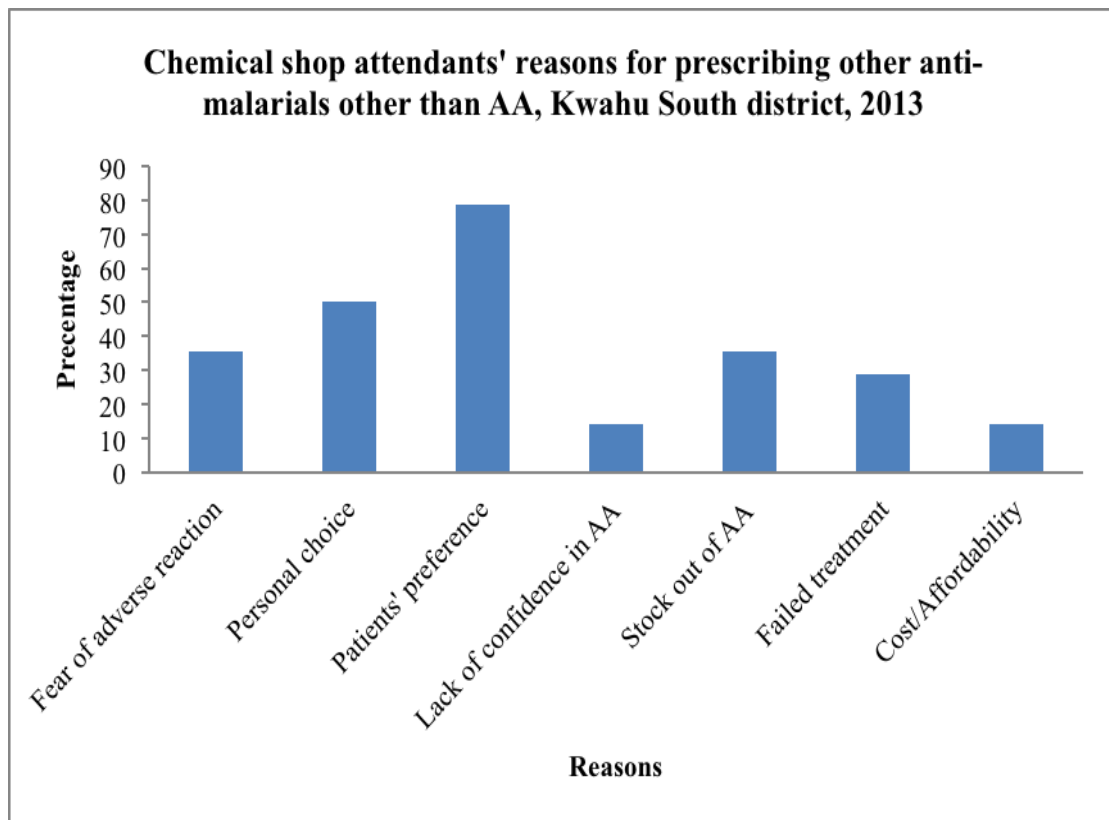


Figure 10. Chemical shop attendants' reasons for prescribing other anti-malarials other than AA, Kwahu South District, 2013

4.4 Factors associated with appropriate management and prescription practices

As shown in Table 11, the factors significantly associated with appropriate treatment at bivariate analysis were: presenting complaints of fever (OR = 1.9, 95% CI = 1.25, 3.03), measured temperature of 37.5 °C or more (OR = 1.8, 95% CI = 1.11, 2.92) and being managed at a hospital compared to other facilities (OR = 8.7, 95% CI = 5.41, 14.12). These factors were positively associated with being managed appropriately.

Bivariate analysis also showed positive association between being managed appropriately and factors such as age of patient less than five years (OR = 1.1, 95% CI = 0.57, 2.01), age greater than 12 years (OR = 1.2, 95% CI = 0.77, 1.87) and possession of active NHIS card (OR = 7.2, 95% CI = 0.88, 59.22). On the other hand, the odds of being managed appropriately were lower in male patients compared to female patients (OR = 0.7, 95% CI = 0.47, 1.05) and in patients having additional diagnosis to malaria (OR = 0.8, 95% CI = 0.55, 1.26). All these differences, however, were statistically insignificant. Age of patient was categorized at both less than five years and 12 years or less. This is because children less than five years bear the brunt of malaria and are important benchmark in public health importance of the disease whilst the age of 12 is usually used as cut-off for paediatric and adult patients.

The factors retained in the logistic regression model as independent predictors of appropriateness of malaria treatment were: measured temperature of 37.5 °C or more (AOR = 2.7, 95% CI = 1.48, 4.85) and being managed at a hospital (AOR = 9.2, 95% CI = 5.29, 15.95).

Table 11. Factors associated with appropriate prescription practice in malaria case management, Kwahu South District, 2012

| Factor | N (%) | Unadjusted | P-value | Adjusted | P-value |
|---|-------------------|-------------------------|-------------------|-------------------------|-------------------|
| | Conforming | OR (95%CI) | | OR (95%CI) | |
| Sex | | | | | |
| Males (n=157) | 70(44.6) | 0.7 (0.47-1.05) | 0.08 | | |
| Females (n= 247) | 132(53.4) | | | | |
| Age | | | | | |
| ≤ 12years (n= 109) | 59(54.1) | 1.2 (0.77-1.87) | 0.41 | | |
| >12 years (n= 287) | 142(49.5) | | | | |
| <5 years (n= 44) | 23(52.3) | 1.1 (0.57-2.01) | 0.83 | | |
| ≥ 5 years (n=352) | 178(50.6) | | | | |
| Malaria diagnosis | | | | | |
| Malaria + additional diagnosis (n= 143) | 67 (46.9) | 0.8 (0.55-1.26) | 0.39 | | |
| Malaria diagnosis alone (n=259) | 133 (51.4) | | | | |
| Possession of NHIS card | | | | | |
| Yes (n=392) | 199(50.8) | 7.2 (0.88-59.22) | 0.07* | | |
| No (n=8) | 1(12.5) | | | | |
| History of fever | | | | | |
| Yes (n= 298) | 158(54.7) | 1.9 (1.25-3.03) | 0.003 | 1.4 (0.84-2.42) | 0.19 |
| No (n= 115) | 44(38.3) | | | | |
| Measured fever | | | | | |
| ≥ 37.5°C (n= 92) | 58 (63.0) | 1.8 (1.11-2.92) | 0.02 | 2.7 (1.48-4.85) | 0.001 |
| <37.5°C (n=271) | 132 (48.7) | | | | |
| Facility type | | | | | |
| Hospital | | | | | |
| Yes (n= 252) | 172(68.3) | 8.7 (5.41-14.12) | < 0.001 | 9.2 (5.29-15.95) | < 0.001 |
| No (n= 152) | 30(19.7) | | | | |

* P- value was determined by Fisher's exact test, as one of the expected cells was less than 5.

In the bivariate analysis (Table 12), age greater than 12 years (OR = 1.9, 95% CI = 1.18, 2.94), history of fever (OR = 2.0, 95% CI = 1.20, 3.26), measured temperature of 37.5 °C or more (OR = 2.8, 95% CI = 1.73, 4.59), having a positive diagnostic test (OR = 1.9, 95% CI = 1.09,3.36) and being managed at a hospital (OR = 2.3, 95% CI = 1.47, 3.70) were positively associated with being prescribed AA at statistically significant levels. This significant association persisted for only measured temperature of ≥ 37.5 °C in the multivariate logistic regression model (AOR = 3.2, 95% CI = 1.58, 6.51).

Table 12. Factors associated with compliance with AA prescription for uncomplicated malaria, Kwahu South District, 2012

| Factor | N (%) | Unadjusted | P-value | Adjusted | P-value |
|--|-------------------|------------------------|-------------------|------------------------|----------------|
| | Conforming | OR (95%CI) | | OR (95%CI) | |
| Sex | | | | | |
| Males (n = 157) | 52 (33.1) | 1.0 (0.68-1.58) | 0.88 | | |
| Females (n = 247) | 80 (32.4) | | | | |
| Age | | | | | |
| ≤ 12years (n = 109) | 47 (43.1) | 1.9 (1.18-2.94) | 0.01 | 1.6 (0.76-3.33) | 0.22 |
| > 12 years (n = 287) | 83 (28.9) | | | | |
| < 5 years (n = 44) | 13 (29.5) | 0.8 (0.42-1.67) | 0.62 | | |
| ≥ 5 years (n =352) | 117 (33.2) | | | | |
| Malaria diagnosis | | | | | |
| Malaria + additional diagnosis (n = 143) | 43 (30.1) | 0.8 (0.53-1.28) | 0.38 | | |
| Malaria diagnosis alone (n = 259) | 89 (34.4) | | | | |
| Possession of NHIS card | | | | | |
| Yes (n = 392) | 130 (33.2) | 3.5 (0.42-28.52) | 0.25 | | |
| No (n = 8) | 1 (12.5) | | | | |
| History of fever | | | | | |
| Yes (n = 298) | 106 (36.7) | 2.0 (1.20-3.26) | 0.01 | 1.2 (0.52-2.58) | 0.72 |
| No (n = 115) | 26 (22.6) | | | | |
| Measured fever | | | | | |
| ≥ 37.5°C (n = 92) | 49 (53.3) | 2.8 (1.73-4.59) | < 0.001 | 3.2 (1.58-6.51) | 0.001 |
| < 37.5°C (n = 271) | 78 (28.8) | | | | |
| Positive diagnostic test | | | | | |
| Yes (n = 105) | 58 (55.2) | 1.9 (1.09-3.36) | 0.02 | 1.7 (0.85-3.35) | 0.14 |
| No (n = 97) | 38 (39.2) | | | | |
| Facility type | | | | | |
| Hospital | | | | | |
| Yes (n = 252) | 99 (39.3) | 2.3 (1.47-3.70) | < 0.001 | 1.7 (0.61-4.58) | 0.31 |
| No (n = 152) | 33 (21.7) | | | | |

CHAPTER FIVE

5. DISCUSSION

From the results, all the health facilities visited had supervisory visits within the last six months indicating strong support from the District Health Management Team. Only three of the health facilities however demonstrated evidence of functional quality assurance systems. Also, all the health workers who had ever been trained on malaria case management were last trained more than six months prior to the study. These are likely to affect the performance of the health facilities in terms of service delivery.

Lack of complete assessment of children under five was another prominent feature. This occurred in 81.2% of patients in the observation sample and 68.2% of all patients in the records review sample. This finding is comparable to findings in Benin by Rowe et al (2001) where they found incomplete assessment of sick children by health workers to be a major deficiency. This finding means that there were possibilities of missing other conditions that may mimic malaria some of which may be potentially fatal.

The health workers report of the practice of counseling all their patients with malaria was at variance with what was observed. Though all but one of those interviewed said they routinely offered counseling to their patients, as much as 33.9% of the patients left the facility without any counseling message. The practice of not counseling patients is therefore what is likely to be norm. It deprives patients of complete management services and may lead to general lack of knowledge on their

diagnoses, non-adherence to treatment schedules, partial treatment and increment in health facility attendance.

The results also show that although almost all the prescribers were conforming to the anti-malarial policy of using ACT in the treatment of uncomplicated malaria, most of the treatment deviated from the algorithm of appropriate management of malaria. Presumptive diagnosis and treatment of patients, as well as prescribing anti-malarials for patients who tested negative for malaria were quite common. This observation was more pronounced in the records reviewed. Compliance of health workers to the guidelines of malaria management was higher during the direct observation. This is most probably as a result of Hawthorne effect where the health workers were likely to be more careful than usual and therefore performed to impress the observers. This may lead to an overestimation of quality of case management. Patient-level indicators of case management quality were based on seven observations per each of the 10 health workers. These indicators therefore reflected the practice of 10 health workers, unlike the records review where the indicators could not be linked with the number of health workers.

Apart from the prescription of Quinine to five pregnant women in their first trimester, the only exception to the compliance with ACT was one record where a patient was treated with artesunate monotherapy in the form of suppository contrary to guidelines. This was far less than that found in other studies in Ghana where 33% of patients were prescribed artesunate monotherapy and in India where artesunate monotherapy was prescribed for 14.8% of patients despite recommendation for ACT

use (Dodoo et al, 2009; Mishra et al, 2011). In the latter study, 18.5% and 6.9% of prescriptions in private and public health facilities were artesunate monotherapy.

The proportion of ACT prescribed was higher than that found in South East Nigeria by Meremikwu et al (2007) where less than half of the prescriptions from government hospitals and only 16.7% of prescriptions from private hospitals were ACT. In terms of the recommended first line treatment of uncomplicated malaria, only 4.6% consisted of the recommended AL. These differences could be explained by the fact that the change of policy to ACT use was relatively new in Nigeria at the time of the study and therefore prescribers had not fully adapted to it.

The use of AL dominated in both the observation and the records review contrary to recommended first line AA. This corresponds to findings in other studies where health workers used other anti-malarials other than the recommended first line drug combination. However, it contrasts with 90.8% of conformity to prevailing first line drugs as observed by Dodoo et al (2009) in Ghana. The non-compliance to AA as first line in this study could be due to the earlier adverse reactions that accompanied its use in the initial stages of its introduction.

In the case of chemical shops, it seems likely that the reason for most patients opting for AL instead of AA was because of their perceived favourable experience with AL in terms of fewer side effects and rapidity of symptoms resolution. It is also possible that the prescribing practices of health workers in the health facilities might have had an influence on the clients' choice of AL. Most clients would most probably like to use drugs they had personally used with successful outcome or that had been

recommended to them. Since most of the prescriptions emanating from the health facilities are those of AL, the patients are more likely to be familiar and comfortable with its usage rather than any other anti-malarials.

Universal utilization of diagnostic testing in the form of RDT or blood film for malaria parasites was very high (90.0%) during the observation. This was very different from the records review where 51% were tested. The difference could be as a result of lack of proper documentation of tasks by the health workers particularly at the lower level facilities where this discrepancy was greater. It could also be due to the fact that, health workers are now changing to conform to universal testing of suspected malaria cases, as the records review was for 2012 whilst the observation was done in 2013. Other studies found lower rates of testing of suspected cases (Meremikwu et al, 2007; Pulford et al, 2012; Rowe et al, 2009;). Testing is very critical to minimizing over diagnosis, over treatment and missing of other potentially serious diseases with their resultant consequences. The level of disregard of negative test results was 33.3% from the observation sample. This is lower than the 82% and 79.3% observed in Papua New Guinea and Kenya respectively (Pulford et al, 2012; Zurovac et al, 2006). The level was however 100% from the records reviewed as all the samples selected were those treated for malaria.

In the bivariate analyses, fever (either by history or by measured axillary temperature of ≥ 37.5 °C) was positively associated with both appropriate treatment of malaria as well as compliance with AA prescription at statistically significant levels. This means that, compared to those who do not have fever, patients with fever were more likely to have been treated appropriately and also given AA. This association

remained significant for measured axillary temperature ≥ 37.5 °C in both models, but not history of fever, after potential confounding factors have been taken into account. This underscores the importance of measuring temperature of patients at the clinics as those whose temperature may not have been measured may have missed being managed appropriately. It seems that health workers had high index of suspicion for malaria when a patient's temperature was 37.5 °C or more. Such patients would therefore be treated more meticulously and in conformity to guidelines. History of fever being a predictor of appropriate case management at bivariate analysis underscores the need for prescribers to ask about fever and not rely on chief complaints alone when managing malaria cases. This is comparable to findings from studies by Zurovac et al (2004) in Kenya and by Zurovac, Tibenderana et al (2008a) in Uganda where chief complaint of fever was associated with treatment quality. It is also consistent with findings by Zurovac et al (2008) in Kenya where history of fever and high temperature were associated with better prescribing practices. The odds of being given appropriate treatment of malaria and receiving AA prescription were significantly higher among those who were treated in the hospital than those treated in the lower health facilities. This finding is quite alarming as it suggests that lower health facilities, which are expected to be the primary port of call to most of the malaria cases, are deficient in malaria case management capacity. This could probably be explained by the fact that the prescribers at the hospital are mostly medical doctors and medical assistants who are formally trained to manage malaria cases unlike other cadres of staff at the lower facilities. Some of these personnel perform outpatient consultations because of shortage of staff and not as a primary function.

Using the facility type as a proxy for cadre of health staff, higher health worker cadres are more likely to be at the hospital facility than the lower centres. This means the higher health worker cadres are more likely to manage appropriately than lower health worker cadres. The exact explanation for this is unclear but may be attributed to the differences in the level of training and experience between the higher and lower cadres of health workers. Poor documentation of tasks at the lower health facilities observed in this study may also be a contributing factor. Since these results were based on the documented tasks in the records, facilities that are averse to documentation may be reflected in poor light with regards to malaria case management. This finding however, is in agreement with other studies (Ucakacon, 2011; Zurovac, Tibenderana et al, 2008b) but contrast with findings from a study by Zurovac et al (2004) in Kenya where lower staff like nursing aides adhered much more closely to treatment guidelines than nurses and clinical officers.

Age less than five years as well as being a paediatric patient (less than or equal to 12 years, was not associated with appropriate treatment of malaria. This finding contrasted with findings from Ghana and Kenya where age was a predictor of compliance with treatment guidelines (Dodoo et al, 2009; Zurovac et al, 2004). When compared to compliance with AA for malaria treatment however, age greater than 12 years was positively associated at bivariate analysis. However there was no significant association with compliance with AA prescription when other confounding factors were controlled for. This finding of age not being an independent determinant of appropriate treatment seems rather disturbing as it suggests that patients are managed in the same way irrespective of their ages. The critical age group of under-five years in

whom the effects of malaria are amplified are not being given the extra attention they require in terms of case management.

Having a positive diagnostic test was positively associated with compliance with AA prescription in only the bivariate analysis but not when confounding factors have been controlled for. This variable was not used in the logistic regression model for appropriate treatment because it was included in its definition. Having an additional diagnosis to malaria was not significantly associated with appropriate treatment malaria. This means that presenting with multiple pathologies was not a barrier to receiving appropriate treatment.

Though most of the chemical shop attendants had been trained, as many as 78.6% felt they needed further training. This is not surprising since as many as 35.7% of them still used Alaxin alone and SP in the treatment of malaria. A probable explanation to this is either the training messages may not have translated into practice or the skills acquired during these trainings could have been lost over time. The latter explanation can be supported by the fact that only a quarter of those who had ever been trained were trained within six months prior to the study. Refresher training is therefore critical so as to optimize malaria case management.

Limitations of the study

- An important limitation of this study was the likelihood of the Hawthorne effect. The presence of the study observers during the consultation had the potential of affecting the performance of the health workers. They may perform better than they usually would do if they

intend to impress the observers. On the other hand, their performance may be worse than usual if they felt nervous by the presence of the observers.

- By collecting self-reported data from the health workers through interviews, they may report what is desirable rather than what is really practiced. However, this has been catered for by triangulation of data using different approaches and data sources.

CHAPTER SIX

6. CONCLUSION AND RECOMMENDATIONS

Malaria case management and prescription practices by health workers in the Kwahu South District were suboptimal. Lack of assessment of children for non-malarial causes of fever, non-compliance with universal utilization of diagnostic testing and inappropriate decision to prescribe anti-malarials as well as minimal counseling of patients by health workers featured prominently as gaps in case management. Use of ACTs however, was the norm in accordance with national treatment guidelines but use of AA as the recommended first line drug was low in favour of AL. Chemical shop attendants, though trained still used Alaxin alone and SP in treatment of uncomplicated malaria. Also, use of AL was a lot more than AA among this group. Refresher training of health workers on malaria case management was virtually non-existence within the last six months. Evidences of functional quality assurance systems were found in only half of the health facilities. Significant predictors of appropriate treatment of malaria were measured temperature of ≥ 37.5 °C and being managed at the hospital (AOR = 2.7, 95% CI = 1.48, 4.85) and (AOR = 9.2, 95% CI = 5.29, 15.95) respectively. Measured fever was also an independent predictor of compliance with AA prescription (AOR = 3.2, 95% CI = 1.58, 6.51).

Recommendations

Based on the findings from the study, the following recommendations are being made for consideration:

The District Health Management Team

1. Given the prevailing situation where health workers who had ever been trained on malaria case management had their last training more than six months ago, regular refresher training should be organized to ensure that health workers are constantly abreast with case management skills. The training should emphasize universal diagnostic testing, appropriate decision to prescribe anti-malarials as well as use of AA as first line treatment of uncomplicated malaria. Chemical shop distributors should have specific training on compliance with recommended guidelines of malaria case management.

Health Facility Management

1. Ensure that functional quality assurance systems comprising quality assurance team and action plans are in existence and being implemented.
2. Encourage all health workers particularly those at the lower level facilities to document assessment tasks performed for reference and continuity of care.
3. Encourage health workers particularly those managing children to perform full assessment of children who have suspected malaria so as to rule out other potentially serious diseases.
4. Support health workers to cultivate the habit of counseling their patients so as to give them insight into their conditions and enhance their adherence to treatment schedules.

Future Researchers

1. Since practices of health workers are likely to change over time, regular follow up study using this study as a baseline is recommended. Also, future studies may include a lot more facilities so as to get a full picture of the district or regional situation in terms of malaria case management.

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APPENDICES

APPENDIX 1: INFORMATION SHEET/ CONSENT FOR PARTICIPANTS

MALARIA CASE MANAGEMENT AND PRESCRIPTION PRACTICES BY
HEALTH WORKERS IN THE KWAHU SOUTH DISTRICT, EASTERN REGION

Principal Investigator: Donne Kofi Ameme

Address: School of Public Health, University of Ghana, Legon

Tel: 0208233513 E-mail: amemedonne@yahoo.com

General Information:

The purpose of this study is to assess how health workers in the Kwahu South District manage malaria cases and what factors inform their case management practices. The study will involve health workers and patients in selected health facilities in the district. It is expected that the results will be used in planning health care delivery in the district. As part of this study, you have been selected to help in obtaining information for this study. If you agree to be part of this research, it will involve either one or both of the following:

- Answering some questions that will be posed to you by a member of the research team.
- Allowing a member of the research team to observe a few of the consultation processes.

The expected duration of each process will be about 20 to 30 minutes.

Possible Risks and Discomforts

The research will not pose any risks to you. You may however experience some minor discomfort when being observed or in answering certain questions. You may refuse to be observed or refuse to answer any question if you feel uncomfortable about it.

Possible Benefits

You may not benefit directly from this study but the findings would benefit the District Health Management Team and the Ghana Health Service in planning health delivery services. Your participation may therefore be helping in improving malaria case management in the district.

Confidentiality

All the information obtained from this study will be confidential and used for the purpose indicated for the study. The information will be securely stored without your name, in a file which will be only be accessible to the research team. A number linked to a particular name will be kept confidential. The results of this study will be disseminated in such a way that no information will be linked to your identity.

Compensation

Participation in this study is purely voluntary. There is no monetary compensation available to you for accepting to be part of this study.

Choice of Participation

You do not have to participate in this study if you do not wish to. Your refusal to participate will not attract any penalty. If you agree to participate, you can withdraw consent and discontinue participation at any time. This will not affect you in any way.

Contact Numbers

If you have any questions, you may ask them now. You may also contact the following people if you have any challenges relating to your participation in the study:

Prof. Edwin Afari

Donne Kofi Ameme

Tel: 020 8131828

Tel: 020 8233513

E-mail: afariea@yahoo.co.uk

E-mail: amemedonne@yahoo.com

PARTICIPANT AGREEMENT

I have read the written information (or have had the information read and adequately explained to me) for the study “MALARIA CASE MANAGEMENT AND PRESCRIPTION PRACTICES BY HEALTH WORKERS IN THE KWAHU SOUTH DISTRICT, EASTERN REGION.” I have been given ample opportunity to have any questions I may have, answered to my satisfaction. I have also been given time and opportunity to consider taking part in this study. I therefore agree to participate in this study.

.....
Signature or Thumbprint of Participant

.....
Date

If a participant cannot read the document, then a Witness is needed:

I was present during the reading and explanation of the consent document to the participant. All questions from the participant were duly answered and the participant agreed to participate in the study.

.....
Signature of Witness

.....
Date

I certify that the purpose and nature of the research, the potential benefits and possible discomforts associated with participating in this research have been explained to the participant who has agreed to voluntarily participate.

.....
Signature of Person Who Obtained Consent

.....
Date

APPENDIX 2: DATA COLLECTION TOOLS

Form A. Health worker Interview Questionnaire - Kwahu South District

| | |
|---|---|
| Instructions: Interview the lead health worker at the facility; who provides curative care services for malaria | |
| INTERVIEWER: INTRODUCE YOURSELF TO THE HEALTH WORKER / CONSENT | |
| <p>I am a student of the University of Ghana School of Public Health. As part of my MPhil dissertation, I am collecting data on Out Patient management of malaria in the district. The information generated will be useful to you, your facility, the DHMT in planning your health service delivery.</p> <p>All information collected from this survey will be confidential. I am asking for your assistance to ensure accurate information is collected. However, participation in answering questions from this survey is voluntary. You may refuse to answer any question or all the questions.</p> | |
| 100 | SIGNATURE OF INTERVIEWER INDICATES PARTICIPANT'S AGREEMENT TO PARTICIPATE AND THAT THE TIME IS CONVENIENT |

| FACILITY IDENTIFICATION | |
|--|---|
| Name of Region: EASTERN Name of District: KWAHU SOUTH Name of facility: Type of Health Facility: (1=Hospital; 2=Health Centre; 3=CHPS; 4= Clinic; 5= Maternity Home 6= Other.....) Operating Authority: 1= Government; 2=Quasi Government; 3= Non-Governmental Organization; 4=Mission/Religious; 5= Private for profit 6=Other.....) | REGION CODE <input style="width: 40px; height: 25px;" type="text"/> DISTRICT CODE <input style="width: 40px; height: 25px;" type="text"/> <input style="width: 40px; height: 25px;" type="text"/> FACILITY CODE <input style="width: 40px; height: 25px;" type="text"/> FACILITY TYPE <input style="width: 40px; height: 25px;" type="text"/> OPERATING AUTHORITY <input style="width: 40px; height: 25px;" type="text"/> |

| | |
|-----------------------------------|---------------------------------------|
| Date: DAY / MONTH / YEAR | INTERVIEWER CODE <input type="text"/> |
| Name of Interviewer..... | |

| Health worker Information | |
|--|--|
| Health worker category: (1=Doctor; 2=Medical Assistance; 3=Nurse; 4=Midwife, 5=Community Health Officer; 6=Other Specify.....) Sex of Health worker; (1=Male; 2=Female) Health worker Code (Start numbering the interviews at each facility from one and continue till you have interviewed all the lead health workers who treat for malaria in the facility) | HEALTH WORKER CATEGORY <input type="text"/> SEX OF HEALTH WORKER <input type="text"/> HEALTH WORKER CODE <input type="text"/> <input type="text"/> |

| NO. | QUESTIONS | CLASSIFICATION CODE | GO TO |
|---|---|--|-------|
| Provider Training and Experience | | | |
| 101 | Do you personally provide care for patients with malaria? | YES.....1 NO.....2 | → END |
| 102 | In what year did you start working in this facility? | YEAR <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> | |
| 103 | What is your current technical qualification? | Medical Officer.....1 Medical Assistant.....2 Nurse.....3 Midwife.....4 Community Health Nurse.....5 Other.....99 | |
| 104 | What year did you graduate with this qualification? | YEAR <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> | |

| NOW I WOULD LIKE TO ASK YOU SOME QUESTIONS ABOUT THE SERVICES YOU PROVIDE HERE IN RELATION TO MALARIA | | | |
|--|--|------------------|----------------------|
| NO | QUESTION | MENTIONED | NOT MENTIONED |
| 105 | What drugs do you usually prescribe for treating uncomplicated malaria? DO NOT READ, DO NOT PROMPT-ASK ANY OTHERS | | |
| A | Artesunate-Amodiaquine | 1 | 2 |
| B | Artesunate only | 1 | 2 |
| C | Amodiaquine only | 1 | 2 |
| D | SP | 1 | 2 |
| E | Artesunate + SP | 1 | 2 |
| F | Artemether/ Lumefantrine or Lonart or Coartem | 1 | 2 |
| G | Alaxin | 1 | 2 |
| H | Quinine | 1 | 2 |
| I | Other, Specify..... | 1 | 2 |

| NO | QUESTION | CLASSIFICATION CODE | GO TO |
|-----------|---|--|---------------------|
| 106 | How often do you prescribe Artesunate-Amodiaquine for the treatment of malaria? | ALWAYS.....1 OFTEN/SOMETIMES.....2 RARELY.....3 NEVER.....4 | 1 OR 2 → 108 |
| 107 | Why will you sometimes prescribe other antimalarials/combinations? CIRCLE ALL APPLICABLE | Fear of adverse reaction.....1 Personal choice.....2 Patient's preference.....3 Stock out of drug.....4 Lack of confidence in drug...5 Other, Specify..... | |

| NO | QUESTION | CLASSIFICATION CODE | |
|-----------|--|----------------------------|-----------|
| 108 | Do you routinely order laboratory test for patients with fever/ suspected malaria? | YES | NO |
| | If yes what laboratory tests do you routinely ask for? | 1 → 108A | 2 109 → |
| | A..Blood film for malaria parasites | 1 | 2 |
| | B. RDT | 1 | 2 |
| | C. Haemoglobin | 1 | 2 |
| | D. Other, Specify..... | 1 | 2 |

| NO | QUESTION | CLASSIFICATION CODE |
|-----|--|--|
| 109 | What factors do you consider before requesting laboratory test for malaria parasites? | Severity of the disease.....1 Age of the patient.....2 Patient's preference.....3 Possession of NHIS.....4 Patient's educational status.....5 Patient's occupation.....6 Other, Specify.....7 |
| 110 | What factors do you consider before prescribing antimalarials for the treatment of malaria? | Severity of the disease.....1 Laboratory confirmed disease....2 Age of the patient.....3 Patient's preference.....4 Possession of NHIS.....5 Availability of drug at facility....6 Patient's educational status.....7 Patient's occupation.....8 Other, Specify.....9 |
| 111 | Do you prescribe/give injection Artemether to patients on OPD basis? A. If yes, how often do you do that? | YES.....1 NO.....2 ALWAYS.....1 OFTEN/SOMETIMES.....2 RARELY.....3 NEVER.....4 |
| 112 | Do you prescribe/ give any other injection to malaria patients on OPD basis? A. If yes, Specify | YES.....1 NO.....2 |

| NO | QUESTION | CLASSIFICATION CODE | |
|-----|---|-----------------------|---------------|
| | | MENTIONED | NOT MENTIONED |
| 113 | What factors influence the dosage of the drugs you prescribe? (DON'T PROBE, TICK AS MENTIONED) | | |
| | A. Age of patient | 1 | 2 |
| | A. Weight of the patient | 1 | 2 |
| | B. Standard Treatment Guidelines | 1 | 2 |
| | C. Cost of drug | 1 | 2 |
| | D. Side effects of treatment | 1 | 2 |
| | E. NHIS | 1 | 2 |
| | F. Other, Specify..... | 1 | 2 |
| 114 | Do you routinely write down your diagnosis? | YES.....1 NO.....2 | |

| | | | | | | | | |
|---|--|--|----------------------|------------|--|--|--|--|
| 115 | Do you routinely ask the patient to come for follow-up visit? | YES.....1 NO.....2 | | | | | | |
| 116 | Do you routinely counsel your patients? | YES.....1 NO.....2 | | | | | | |
| 117 | If you counsel your patients, what do you counsel them on? (DON'T PROBE, TICK AS MENTIONED) | MENTIONED | NOT MENTIONED | | | | | |
| 118 | A. How to correctly take drugs | 1 | 2 | | | | | |
| | B. The disease | 1 | 2 | | | | | |
| | C. The prevention of the disease | 1 | 2 | | | | | |
| | D. The need for follow-up | 1 | 2 | | | | | |
| | E. Other, Specify..... | 1 | 1 | | | | | |
| Now I would like to ask a few questions about training and standards and guidelines in this facility | | | | | | | | |
| NO | QUESTION | CLASSIFICATION CODE | | | | | | |
| 119 | Do you have a copy of the following? (Ask to see a copy) | Yes seen or reported to have | No | Don't Know | | | | |
| A | National Malaria Drug policy | 1 | 2 | 8 | | | | |
| B | Standard Treatment Guidelines | 1 | 2 | 8 | | | | |
| C | Malaria Treatment Guidelines | 1 | 2 | 8 | | | | |
| D | Malaria Counseling Card | 1 | 2 | 8 | | | | |
| 120 | Have you received any training/refresher or follow up on malaria case management? If Yes: In what year did you receive the last training? | YES.....1 NO.....2 <table border="1" style="width: 100%; height: 20px;"> <tr> <td style="width: 25%;"></td> <td style="width: 25%;"></td> <td style="width: 25%;"></td> <td style="width: 25%;"></td> </tr> </table> | | | | | | |
| | | | | | | | | |
| 121 | Do you feel you need additional training in order to be able to manage malaria better? | YES.....1 NO.....2 | | | | | | |

Thank you very much for allowing us to sit in your consultation today and thank you also for helping us complete this interview. It is our hope that the results will lead to more malaria programming that will involve you.

INTERVIEWERS COMMENTS:

Form B. Patient Observation Form - Kwahu South District

| | |
|--|---|
| Instructions: Recruit patients from the history table and observe their consultation with the lead health worker/ prescriber | |
| INTERVIEWER: INTRODUCE YOURSELF TO THE PATIENT AND THEN THE LEAD HEALTH WORKER /CONSENT | |
| I am a student of the University of Ghana School of Public Health. As part of my MPhil dissertation, I am collecting data on Out Patient management of malaria in the district. The information generated will be useful to the facility and the DHMT in planning health service delivery. This aspect of the study will involve observation of the consultation process. All information collected from this survey will be confidential. I am asking for your assistance to ensure accurate information is collected. However, participation in this survey is voluntary. You may withdraw from the survey at any time without losing your rights as a client of this facility or as a member of this district. | |
| 100 | SIGNATURE OF INTERVIEWER INDICATES PARTICIPANT'S AGREEMENT TO PARTICIPATE AND THAT THE TIME IS CONVENIENT |

| FACILITY IDENTIFICATION | |
|--|---|
| Name of Region: EASTERN | FACILITY CODE <input type="text"/> |
| Name of District: KWAHU SOUTH | HEALTH WORKER TYPE <input type="text"/> |
| Name of facility..... | HEALTH WORKER SEX <input type="text"/> |
| Name of Observer..... | FACILITY TYPE <input type="text"/> |
| Date..... | OPERATING AUTHORITY <input type="text"/> |
| Type of health worker observed: Doctor= 1, MA= 2, Nurse= 3, Midwife= 4, Other= 5: Specify..... | HEALTH WORKER NUMBER <input type="text"/> |
| Sex of health worker: Male= 1, Female = 2 Type of health facility: District hospital= 1, Other hospital=2, Polyclinic=3, Health centre= 4, Clinic= 5, CHPS= 6, Other, Specify..... | (For first health worker observed in a consultation room, write 1. If the health worker in THAT consultation room changes write 2, 3 etc) |
| Operating Authority: Government=1, Mission /Religious= 2, Private for Profit= 3, Quasi- government= 4, Other, Specify..... | |

| NO | QUESTION | CLASSIFICATION CODE | |
|-----|--|--|-------------------------------------|
| 200 | How old is the patient? A. WRITE AGE IN FULL YEARS..... B. IF PATIENT IS LESS THAN 5 YEARS, WRITE AGE IN MONTHS..... | Under 5 years 1 → 200B | Over 5 years 2 → 200A |
| 201 | Sex of patient | Male =1 | Female = 2 |
| 202 | Does the patient possess a valid NHIS card? | Yes 1 | No 2 |
| 203 | Occupation of patient | Farmer.....1 Trader.....2 Businessman/woman.....3 Health worker.....4 Teacher.....5 Student/Pupil.....6 Other, Specify.....7 | |

| NO. | What reason(s) does patient/ caregiver provide for coming to the facility? | YES | NO |
|-----------------------------------|---|---------------------|-----------|
| 204 | A..Fever/Hot body | 1 | 2 |
| | B. Headache | 1 | 2 |
| | C. Body pains | 1 | 2 |
| | D. Vomiting | 1 | 2 |
| | E. Chills | 1 | 2 |
| | F. Poor feeding | 1 | 2 |
| | G..Convulsion | 1 | 2 |
| | H. Other, Specify..... | 1 | 2 |
| NO | QUESTION | CLASSIFICATION CODE | |
| 205 | Does the health worker ask the patient/caregiver about any of the following symptoms since the beginning of the illness? | YES | NO |
| | A..Duration of symptoms | 1 | 2 |
| | B. Unable to eat and drink | 1 | 2 |
| | C. Vomiting everything | 1 | 2 |
| | D. Convulsion | 1 | 2 |
| | E. Headache | 1 | 2 |
| | F. Cough/Difficulty in breathing | 1 | 2 |
| | G. Chills | 1 | 2 |
| | H. Dark urine | 1 | 2 |
| | I. Joint pains | 1 | 2 |
| J. Difficult or painful urination | 1 | 2 | |

| | | | |
|--|--|---|---|
| | K. Little or no urination in the past 24 hours | 1 | 2 |
| | L. Diarrhoea / Abdominal pain | 1 | 2 |
| | M. Bloody stools | 1 | 2 |
| | N. Ear pain | 1 | 2 |
| | O. Abnormal bleeding | 1 | 2 |
| | P. Other..... | 1 | 2 |

| Communication/ Counseling | | | |
|----------------------------------|---|---|-----------------------|
| NO | QUESTION | CLASSIFICATION CODE | |
| 206 | Does the health worker provide any of the following advice when counseling the patient/caregiver? | YES | NO |
| | Tell the caregiver/patient what illness (es) child/patient has | 1 | 2 |
| | Management of fever by sponging and/ giving paracetamol | 1 | 2 |
| | Give extra fluid to the patient during the illness | 1 | 2 |
| | Continue feeding the child/ eating as a patient during this sickness and after | 1 | 2 |
| | Talk to the caregiver patient about ITN use | 1 | 2 |
| | Describe signs and symptoms in the child/ patient for which the caregiver/child should return to the facility | 1 | 2 |
| | If medicines are prescribed, does the prescriber describe how to take each medicine completely? | 1 | 2 |
| | If medicines are prescribed, does the health worker ensure patient takes the first dose at the facility(administers himself or tells pharmacy to administer the medicine) | 1 | 2 |
| Laboratory | | | |
| NO | QUESTION | CLASSIFICATION CODE | |
| 207 | Does the health worker order laboratory tests? | YES 1 | NO 2 |
| 208 | What laboratory tests were ordered? | Full blood count.....1 Hb.....2 BF for mps.....3 RDT.....4 Others, Specify..... | |
| 209 | What was the Haemoglobin (Hb) result? | < 8 g/dl.....1 ≥8g/dl.....2 Result not available on same day.....3 Patient did not return with result.....4 Test not done.....5 | |

| | | |
|--|--|---|
| 210 | What was the parasitaemia result? | +.....1 ++.....2 +++.....3 ++++.....4 Result not available on same day.....5 Patient did not return with result.....6 Test not done.....7 |
| AFTER THE CONSULTATION, REVIEW PATIENT'S CARD WITH THE HEALTH WORKER- Ask about the patient's diagnosis | | |
| NO | QUESTION | CLASSIFICATION CODE |
| 211 | What diagnosis did the health worker provide? | Malaria (Uncomplicated).....1 Severe malaria.....2 Other, Specify..... |
| 212 | What other diagnosis did the health worker make? | Enteric fever.....1 URTI.....2 Pneumonia.....3 Otitis media.....4 Anaemia.....5 Others, Specify..... No additional diagnosis.....9 |

| NO | What oral/suppository medications were prescribed? | Yes | No | Prescription |
|-----|--|-----|----|--|
| 213 | A..Artesunate + Amodiaquine antimalarial tablets | 1 | 2 | Formulation..... Amount each time..... Number of times per day..... Total days..... |
| | B. Artesunate + Amodiaquine antimalarial syrup | 1 | 2 | Formulation..... Amount each time..... Number of times per day..... Total days..... |
| | C. Artemether + Lumefantrine antimalarial tablets | 1 | 2 | Formulation..... Amount each time..... Number of times per day..... Total days..... |
| | D. Artemether + Lumefantrine antimalarial Syrup | 1 | 2 | Formulation..... Amount each time..... Number of times per day..... Total days..... |
| | E. Other antimalarial tablet/syrup..... | 1 | 2 | Formulation..... Amount each time..... Number of times per day..... Total days..... |

| | | | | |
|-----|--|------------|-----------|--|
| | F. Antibiotic tablet/syrup..... | 1 | 2 | Formulation..... Amount each time..... Number of times per day..... Total days..... |
| | G. Antibiotic tablet/syrup..... | 1 | 2 | Formulation..... Amount each time..... Number of times per day..... Total days..... |
| | H. Paracetamol | 1 | 2 | |
| | I. Iron tablets/syrup | 1 | 2 | |
| 213 | What other medications were prescribed? | Yes | No | Prescription |
| | J. Multivitamin | 1 | 2 | |
| | K. ORS | 1 | 2 | |
| | L. Injection(s)..... | 1 | 2 | Amount each time..... Number of times per day..... Total days..... |
| | M. Other..... | 1 | 2 | |

OBSERVER'S COMMENT:

Form C. Patient's Record Review Checklist - Kwahu South District

| Consent/ General Information | |
|---|---|
| <p>FOR OUTPATIENT RECORDS: FIND THE MANAGER OR THE MOST SENIOR HEALTH WORKER RESPONSIBLE FOR OUTPATIENT SERVICES WHO IS PRESENT AT THE FACILITY. Introduce yourself and read the following.</p> <p>I am a student of the University of Ghana School of Public Health. As part of my MPhil dissertation, I am collecting data on how uncomplicated malaria is managed at health facility level in the district. The information generated will be useful to you, your facility, the DHMT in planning your health service delivery. This part of the study will review records of patients managed as uncomplicated malaria.</p> <p>All information collected from this survey will be confidential and using records for this survey will be voluntary. You can refuse to let me use any record. No names of patients will be collected in this study. I am asking for your assistance to ensure accurate information is collected. Should there be any person who is most appropriate in providing me any other information; I would appreciate your introducing me to that person.</p> <p>Do you have any questions for me? Can we begin now?</p> | |
| 300 | SIGNATURE OF INTERVIEWER INDICATES PARTICIPANT'S AGREEMENT TO PARTICIPATE AND THAT THE TIME IS CONVENIENT |

| FACILITY IDENTIFICATION | |
|--|--|
| <p>Name of Region: EASTERN</p> <p>Name of District: KWAHU SOUTH</p> <p>Name of Facility:.....</p> <p>Type of Health Facility: (1=Hospital; 2=Health Centre; 3=CHPS; 4= Clinic; 5= Maternity Home 6= Other.....)</p> <p>Operating Authority: 1= Government; 2=Quasi Government; 3= Non-governmental organization; 4 =Mission/Religious; 5= Private for profit 6=Other.....)</p> | <p>REGION CODE <input type="text"/></p> <p>DISTRICT CODE <input type="text"/></p> <p>FACILITY CODE <input type="text"/></p> <p>FACILITY TYPE <input type="text"/></p> <p>OPERATING AUTHORITY <input type="text"/></p> <p>INTERVIEWER CODE <input type="text"/></p> |

| | | | | |
|---|----------------------|---------|----------------------|----------------------|
| Record Identification/ Folder number | <input type="text"/> | ID Code | <input type="text"/> | <input type="text"/> |
| Date of Consultation DAY/ MONTH/ YEAR | | | | |

| NO | QUESTION | CLASSIFICATION CODE | |
|-----|---|--|----------|
| 301 | What is the age of the patient? | (Years) Missing.....99 | |
| 302 | What is the sex of the patient? | Male1 Female.....2 Missing.....99 | |
| 303 | What is the weight of the patient? | Missing.....99 | |
| 304 | What is the temperature of the patient? | Missing.....99 | |
| 305 | Does the patient an active NHIS card? | Yes.....1 | No.....2 |
| 306 | What is the occupation of the patient? | Farmer.....1 Trader.....2 Businessman/woman.....3 Health worker.....4 Teacher.....5 Student/Pupil.....6 Other, Specify.....7 | |
| 307 | What is the educational level of the patient? | Primary.....1 Secondary/JSS.....2 Tertiary.....3 None.....4 Missing.....99 | |

| 308 | Does the record note the following symptoms? | YES | NO |
|-----|--|-----|----|
| | A..Fever | 1 | 2 |
| | B. Chills | 1 | 2 |
| | C. Headache | 1 | 2 |
| | D. General malaise/ Body pains | 1 | 2 |
| | E. Vomiting/Abdominal pain/Diarrhoea | 1 | 2 |
| | F. Startling attacks | 1 | 2 |
| | G. Anorexia/Poor feeding | 1 | 2 |
| | Others, Specify..... | 1 | 2 |

| | | | |
|-----|--|------------|-------------|
| 309 | Does the record show the duration of symptoms? | 1 | 2 |
| 310 | What is the duration of fever? (If 309 = 2 OR Not stated) | ≤ 48hrs =1 | > 48hrs = 2 |
| | | N/A = 3 | |
| 311 | Does the record note the following signs? | 1 | 2 |
| | A..Warm to touch/Febrile | 1 | 2 |
| | B. Pallor | 1 | 2 |
| | C. Hydration | 1 | 2 |
| | D. Jaundice | 1 | 2 |
| | E. Chest Findings | 1 | 2 |
| | F. Ear Examination Findings | 1 | 2 |
| | G. Throat Examination Findings | 1 | 2 |
| | E. Other, Specify..... | 1 | 2 |

| | | | | |
|-----|--|------------|-----------|--|
| 312 | Does the record have the following laboratory investigations? | YES | NO | Result |
| | A..Blood film for malaria parasites | 1 | 2 | |
| | B. Haemoglobin (Hb) | 1 | 2 | |
| | C. RDT | 1 | 2 | |
| | D. Full Blood Count (FBC) | 1 | 2 | Hb |
| | E. Others, Specify..... | 1 | 2 | |
| 313 | Does the record have any of the following drug treatment? | Yes | No | Prescription |
| | A..Artesunate + Amodiaquine antimalarial | 1 | 2 | Formulation..... Amount each time..... Number of times per day..... Total days..... |
| | C. Artemeter + Lumefantrine antimalarial | 1 | 2 | Formulation..... Amount each time..... Number of times per day..... Total days..... |
| | E. Other antimalarial tablet/syrup..... | 1 | 2 | Formulation..... Amount each time..... Number of times per day..... Total days..... |
| | F..Amoxicillin/Co-amoxiclav Tablet/syrup | 1 | 2 | Formulation..... Amount each time..... Number of times per day..... Total days..... |
| | G. Other antibiotic..... | 1 | 2 | Formulation..... Amount each time..... Number of times per day..... Total days..... |

| | Does the record have any of the following drug treatment? | Yes | No | Prescription |
|-----|--|------------|-----------|---|
| | H..Injection..... | 1 | 2 | Amount each time..... Number of times per day..... Total days..... |
| | I..Analgesics: Paracetamol, Brufen, Diclofenac | 1 | 2 | |
| | J..Iron tablets/syrup | 1 | 2 | |
| | K..Multivitamins | 1 | 2 | |
| | L..Other, Specify..... | 1 | 2 | |
| 314 | Total Number of drugs prescribed | | | One.....1 Two.....2 Three.....3 Four.....4 More than Four.....5 |
| 315 | What was the diagnosis? | | | Malaria.....1 Uncomplicated/Simple malaria.....2 Severe malaria.....3 Malaria + URTI.....4 Malaria + Pneumonia.....5 Malaria + Other, Specify.....6 Typhoid fever.....7 Missing.....99 |

REVIEWER'S COMMENTS:

Form D.1 Facility Audit Checklist – Kwahu South District

| FACILITY IDENTIFICATION | |
|--|--|
| Name of Region: EASTERN Name of District: KWAHU SOUTH Name of Facility:..... Type of Health Facility: (1=Hospital; 2=Health Centre; 3=CHPS; 4= Clinic; 5= Maternity Home 6= Other.....) Operating Authority: 1= Government; 2=Quasi Government; 3= Non-governmental organization; 4 =Mission/Religious; 5= Private for profit 6=Other.....) | REGION CODE <input type="text"/> DISTRICT CODE <input type="text"/> FACILITY CODE <input type="text"/> FACILITY TYPE <input type="text"/> |
| Date: DAY / MONTH / YEAR Name of Interviewer..... | OPERATING AUTHORITY <input type="text"/> INTERVIEWER CODE <input type="text"/> |

Consent/ General Information

I am a student of the University of Ghana School of Public Health. As part of my MPhil dissertation, I am collecting data on how uncomplicated malaria is managed at health facility level in the district. The information generated will be useful to you, your facility, the DHMT in planning your health service delivery. This part of the study will review general management at the facility including outpatient and pharmacy practices in relation to malaria case management.

All information collected from this survey will be confidential and answering the questions is voluntary. You can refuse to answer any question. No identifying information of respondents will be collected in this study. I am asking for your assistance to ensure accurate information is collected. Should there be any person who is most appropriate in providing me any other information; I would appreciate your introducing me to that person

.Do you have any questions for me? Can we begin now?

400

SIGNATURE OF INTERVIEWER INDICATES PARTICIPANT'S AGREEMENT TO PARTICIPATE AND THAT THE TIME IS CONVENIENT

| NO | QUESTION | CLASSIFICATION CODE | GO TO |
|--|--|---|-------|
| 401 | Is there a trained health worker present at the facility at all times (24 hours a day)? | Yes.....1 No.....2 Don't Know.....8 | |
| 402 | Is there a trained health worker available on call at all times after normal working hours? IF YES ASK TO SEE A CURRENT DUTY ROSTER. | Yes.....1 No.....2 Don't Know.....8 | |
| <p>Now I have some questions about the staff. I would like to know the highest technical classification and the number of staff who are routinely assigned for services. This may include staff who provide both inpatient and outpatient services but NOT staff who provide purely administrative services.</p> <p>COUNT STAFF IN ONE CATEGORY. DO NOT INCLUDE STAFF IN TRAINING</p> | | | |
| 403 | QUALIFICATION | TOTAL NUMBER | |
| A | Medical Doctors(INCLUDE DOCTORS WITH SPECIALTY TRAINING) | <input type="text"/> <input type="text"/> | |
| B | Medical/Physician Assistants | <input type="text"/> <input type="text"/> | |
| C | Public Health Nurse | <input type="text"/> <input type="text"/> | |
| D | Midwife | <input type="text"/> <input type="text"/> | |
| E | Registered Staff Nurse | <input type="text"/> <input type="text"/> | |
| F | Health Assistant Clinical Nurse | <input type="text"/> <input type="text"/> | |
| G | Disease Control Officer | <input type="text"/> <input type="text"/> | |
| H | Community Health Nurse | <input type="text"/> <input type="text"/> | |
| I | Pharmacist | <input type="text"/> <input type="text"/> | |

| 403 | QUALIFICATION | TOTAL NUMBER | |
|-----|--|----------------------|--|
| J | Dispensing Technician/ Technologist | <input type="text"/> | |
| K | Dispensing Assistant | <input type="text"/> | |
| L | Laboratory Technicians/Technologist | <input type="text"/> | |
| M | Health Extension Worker | <input type="text"/> | |
| N | Ward Assistant/ Ward Orderly | <input type="text"/> | |
| O | Labourers/Casual Workers | <input type="text"/> | |
| P | Biostatistician/ Biostatistician Assistant/ Medical Record Assistant | <input type="text"/> | |
| Q | Security men/women | <input type="text"/> | |
| R | Other, Specify..... | <input type="text"/> | |

| NO | QUESTION | CLASSIFICATION CODE | GO TO |
|-----|---|---|---------------|
| 404 | Does this facility have formal meetings to review management/administrative issues? | Yes.....1 No.....2 Don't Know.....8 | 2 OR 8 407 |
| 405 | How often are formal meetings held to review management/administrative issues | Bi-monthly.....1 Monthly.....2 Bi- annually.....3 Annually.....4 Other, Specify.....5 | |
| 406 | Is an official record of meetings maintained? IF YES, ASK TO SEE SOME DOCUMENTATION (MINUTES AND NOTES) FROM THE MOST RECENT MEETINGS | Yes, Document seen.....1 Yes, Document not seen...2 No documentation maintained.....3 | |

| NO | QUESTION | CLASSIFICATION CODE | GO TO | |
|-----|--|--|----------------------|-----------------------|
| 407 | A).Does the facility have any system for determining client opinion about the facility services rendered? B) IF YES, CIRCLE ALL THAT APPLY | Yes.....1 No.....2 Don't Know.....8 Suggestion box.....1 Client Survey Form...2 Client Interview.....3 Community Durbar...4 Public Forum.....5 Other, Specify.....6 | 2 OR 8 → 409 | |
| 408 | In the past 6 months, have any changes been made as a result of client opinion? | Yes.....1 Specify..... No.....2 Don't Know.....8 | | |
| 409 | Does this facility have Quality Assurance Team? | Yes.....1 No.....2 Don't Know.....8 | 2 OR 8 → 411 | |
| 410 | Does the team have a Quality Assurance Action Plan? If yes, ask to see plan or evidence of recent activity | Yes, Plan seen.....1 Yes, No plan seen....2 No.....3 | | |
| 411 | Are any of the following methods of Quality Assurance used? IF YES, ASK TO SEE SOME DOCUMENTATION (MINUTES/ REPORTS ETC.) | | | |
| | METHOD Don't Probe. Tick as mentioned. | Mentioned | Not mentioned | No Record Seen |
| A | Supervisory checklist for health system components(e.g. service specific equipments, drugs, supplies and records) | 1 | 2 | 8 |
| B | Supervisory checklist for health service provision(e.g. Observation Checklist) | 1 | 2 | 8 |
| C | Mortality meeting | 1 | 2 | 8 |
| D | Periodic audit of medical records or service registers | 1 | 2 | 8 |
| E | Quality Assurance or Client Oriented Provider Efficient (COPE) committee/ team. | 1 | 2 | 8 |
| F | Regional/ District Health Management Teams visits' feedback | 1 | 2 | 8 |
| G | Clinical Conferences/ Meetings | 1 | 2 | 8 |
| H | Other, Specify..... | 1 | 2 | 8 |

| NO | QUESTION | CLASSIFICATION CODE | | |
|-----|--|--|-----------|-------------------|
| 412 | When was the last time a supervisor from outside the facility came for a supervisory visit? | Within prior month.....1 More than 6 months ago...2 Never3 | | |
| 413 | Within the last visit of a supervisor from outside the facility, did the supervisor perform any of the following activities? | Yes | No | Don't Know |
| A | Check some registers or service related books? | 1 | 2 | 8 |
| B | Discuss problems? | 1 | 2 | 8 |
| C | Discuss policy/administrative issues? | 1 | 2 | 8 |
| D | Discuss technical protocols practices or service delivery technical issues? | 1 | 2 | 8 |
| E | Hold an official meeting? | 1 | 2 | 8 |
| F | Observe individual staff providing services? | 1 | 2 | 8 |
| G | Do any other thing? Specify..... | 1 | 2 | 8 |
| 414 | Is there a printed referral form which is sent with referrals from this facility? IF YES, ASK TO SEE FORM. | Yes, Form seen.....1 Yes, Form not seen.....2 No Form.....3 Don't Know.....8 | | |
| 415 | Does this facility have electricity? | Yes.....1 No.....2 Don't Know.....8 | | |
| 416 | Is there a constant back-up for electricity supply? | Yes.....1 No.....2 Don't Know.....8 | | |
| 417 | How is water made available for use in the examination/consultation area TODAY? | Piped.....1 Bucket/Basin.....2 Veronica bucket.....3 No water in service delivery areas...4 | | |

| NO | QUESTION | CLASSIFICATION CODE | GO TO |
|-----|---|---|-------|
| 418 | Is there a waiting area for clients where they are protected from sun and rain? | Yes.....1 No.....2 Don't Know.....8 | |
| 419 | Is there a toilet (latrine) in functioning condition for client use? | Yes.....1 No.....2 Don't Know.....8 | |
| 420 | Does this facility have a working phone, cell phone or short-wave radio? | Yes.....1 No.....2 Don't Know.....8 | |

| | | | | | | | |
|-----|--|--|----------------------|-----------------------|--|--|---------------------|
| 421 | ASSESS THE GENERAL CLEANLINESS OF THE FACILITY. -A facility is clean if the floors are swept; counters/tables are wiped and free from obvious dirt or waste -A facility is not clean if there is obvious dirt/ waste/broken objects on floors or counter | FACILITY CLEAN.....1 FACILITY NOT CLEAN..2 | | | | | |
| 422 | Does this facility have copies of the following? IF YES, ASK TO SEE A COPY | Reported Available | Not Available | Not Determined | | | |
| A | New Standard Treatment Guidelines | 1 | 2 | 8 | | | |
| B | New Anti malarial Drug Policy | 1 | 2 | 8 | | | |
| C | Treatment Protocol in consulting rooms | 1 | 2 | 8 | | | |
| D | IPT Manual | 1 | 2 | 8 | | | |
| 423 | How many staff have been trained on malaria case management, within the last 6 months? | <table border="1" style="display: inline-table; vertical-align: middle;"> <tr> <td style="width: 30px; height: 20px;"></td> <td style="width: 30px; height: 20px;"></td> <td style="width: 30px; height: 20px;"></td> </tr> </table> | | | | | Don't Know 8 |
| | | | | | | | |

INTERVIEWER'S COMMENTS:

Form D.2 Facility Audit Checklist (Pharmacy/Chemical supply outlets)

| | |
|---|---|
| FIND THE MANAGER OR MOST SENIOR PERSON MANAGING THE PHARMACY. INTRODUCE YOURSELF AND READ THE FOLLOWING: | |
| I am a student of the University of Ghana School of Public Health. As part of my MPhil dissertation, I am collecting data on how uncomplicated malaria is managed at health facility level in the district. The information generated will be useful to you, your facility and the DHMT in planning your health service delivery. This part of the study will review pharmacy practices in relation to malaria case management. All information collected from this survey will be confidential and answering the questions is voluntary. You can refuse to answer any question. No identifying information of respondents will be collected in this study. I am asking for your assistance to ensure accurate information is collected. Should there be any person who is most appropriate in providing me any other information; I would appreciate your introducing me to that person Do you have any questions for me? Can we begin now? | |
| 500 | SIGNATURE OF INTERVIEWER INDICATES PARTICIPANT'S AGREEMENT TO PARTICIPATE AND THAT THE TIME IS CONVENIENT |

| NO | QUESTION | CLASSIFICATIONCODE | | |
|-----|---|--------------------|----|------------|
| | | Yes | No | Don't Know |
| 501 | Do you have the following drugs in store today? Can you show me a sample of each? | | | |
| A | Artesunate/ Amodiaquine | 1 | 2 | 8 |
| B | Artesunate | 1 | 2 | 8 |
| C | Amodiaquine | 1 | 2 | 8 |
| D | Artemether/ Lumefantrine/ Coartem/Lonart | 1 | 2 | 8 |
| E | SP | 1 | 2 | 8 |
| F | Alaxin | 1 | 2 | 8 |
| G | DihydroartemisininPiperaquine | 1 | 2 | 8 |
| H | Quinine | 1 | 2 | 8 |
| I | Other, Specify..... | 1 | 2 | 8 |
| 502 | Have you had stock out of any of the following drugs in the past 6 months? | | | |
| A | Artesunate/ Amodiaquine | 1 | 2 | 8 |
| B | Artesunate | 1 | 2 | 8 |
| C | Amodiaquine | 1 | 2 | 8 |
| D | Artemether/ Lumefantrine/ Coartem/Lonart | 1 | 2 | 8 |
| E | SP | 1 | 2 | 8 |
| F | Alaxin | 1 | 2 | 8 |
| G | DihydroartemisininPiperaquine | 1 | 2 | 8 |
| H | Quinine | 1 | 2 | 8 |
| I | Other, Specify..... | 1 | 2 | 8 |

| NO | QUESTION | CLASSIFICATION CODE | | | |
|-----|---|--|---------------------|-----------|-------------------|
| 503 | Where do you usually get your stock of drugs supply from? | Central Medical Stores.....1 Private purchases from companies...2 Private purchases from town.....3 Other, Specify.....4 | | | |
| 504 | How often do you do stocking of drugs in the facility? | Weekly.....1 Fortnightly.....2 Monthly.....3 When necessary.....4 Don't Know.....5 Other, Specify.....6 | | | |
| | | Yes seen | Yes Not Seen | No | Don't Know |
| 505 | Do pharmacy staff label drug appropriately for clients? | 1 | 2 | 3 | 8 |
| 506 | Do pharmacy staff tell clients how to take the malaria drug appropriately? | 1 | 2 | 3 | 8 |
| 507 | Do you have the AMFm drugs in the pharmacy today? (With green leaf label) | 1 | 2 | 3 | 8 |
| 508 | What brands of Artesunate/Amodiaquine do you have available in the pharmacy today? | | | | |
| 509 | What drugs do you most commonly get prescription for? IN ORDER OF FREQUENCY STARTING FROM THE MOST FREQUENT (AS 1, 2, 3...ETC.) | | | | |
| A | Artesunate/ Amodiaquine | | | | |
| B | Artesunate | | | | |
| C | Amodiaquine | | | | |
| D | Artemether/ Lumefantrine/ Coartem/Lonart | | | | |
| E | SP | | | | |
| F | Alaxin | | | | |
| G | DihydroartemisininPiperaquine | | | | |
| H | Other, Specify..... | | | | |

| NO | QUESTION | CLASSIFICATION CODE | GO TO |
|-----|--|---|-----------------|
| 510 | Do some of your clients come back complaining of side effects? | Yes.....1 No.....2 Don't Know.....8 | 2 OR 8 → 513 |

| | | |
|---|--|---|
| 511 | What side effects do people most commonly complain of? | Dizziness.....1 Headache.....2 Nausea/Vomiting.....3 Palpitation.....4 Neck stiffness.....5 Protruded tongue.....6 Fits/Convulsion.....7 Worsening illness.....8 Others, Specify..... |
| 512 | When a client comes to you complaining of side effects after having taken any antimalarials, what do you do? | Reassure patient and send home...1 Recommend another drug.....2 Refer patient to prescriber.....3 Fill adverse reaction form.....4 Refer to a health facility.....5 Other, specify..... |
| 513 | How do you dispense a specific dose of antimalarials? | Dose as written by the prescriber.....1 Use treatment charts available.....2 Calculate based on weight.....3 Other, Specify.....4 |
| 514 | Do you have a measuring scale in this pharmacy? | Yes.....1 No.....2 Don't Know.....8 |
| 515 | Do you have a measuring container in this pharmacy? | Yes.....1 No.....2 Don't Know.....8 |
| 516 | Do you have a weighing scale in this pharmacy? | Yes.....1 No.....2 Don't Know.....8 |
| 517 | Has anyone in this pharmacy had specific training on malaria case management in the last 6 months? | Yes.....1 No.....2 Don't Know.....8 |
| <u>PRIVATE CHEMICAL SUPPLY OUTLETS ONLY</u> | | |
| Now I would like to ask you some questions about the services you provide here in relation to malaria management | | |
| 518 | Do you personally diagnose malaria in patients/clients who present at your unit with complaints? | Yes.....1 No.....2 Don't Know.....8 |
| 519 | If yes, what factors do you consider in diagnosing malaria in your clients/patients | Patient's complaints.....1 Laboratory result.....2 Both patients' complaints and laboratory results3 Patients age.....4 |

| NO | QUESTION | MENTIONED | NOT MENTIONED |
|-----|---|---|---------------------------|
| 520 | What drugs do you usually give for treating uncomplicated malaria? DO NOT READ; DO NOT PROMPT OR ASK ANY OTHERS | | |
| A | Artesunate-Amodiaquine | 1 | 2 |
| B | Artesunate only | 1 | 2 |
| C | Amodiaquine only | 1 | 2 |
| D | SP | 1 | 2 |
| E | Artesunate + SP | 1 | 2 |
| F | Artemether-Lumefantrine or Lonart or Coartem | 1 | 2 |
| G | Alaxin | 1 | 2 |
| H | Quinine | 1 | 2 |
| I | Other,..... | 1 | 2 |
| 521 | How often do you give Artesunate-Amodiaquine for the treatment of uncomplicated malaria | ALWAYS.....1 OFTEN/SOMETIMES.....2 RARELY.....3 NEVER.....4 | 1 OR 2 →522 |
| 522 | Why will you sometimes give other antimalarials/ combinations? CIRCLE ALL THAT APPLY | Fear of adverse reaction.....1 Personal choice.....2 Patient's preference.....3 Stock out of drug.....4 Lack of confidence in drug...5 Other, Specify..... | |
| 523 | Do you routinely offer laboratory test for patients with fever/suspected malaria? If yes, what laboratory test(s) do you offer?..... | YES = 1 → 524 | NO = 2 →525 |
| 524 | What factors do you consider before offering laboratory test for your clients? | Severity of the disease.....1 Age of the patient.....2 Patient's preference.....3 Possession of NHIS.....4 Patient's educational status.....5 Patient's occupation.....6 Other, Specify.....7 | |
| 525 | Do you give injection Artemether to clients with malaria at your facility? | YES.....1 NO.....2 | |

| | | |
|-----|---|--|
| | A. If yes, how often do you do that? | ALWAYS.....1 OFTEN/SOMETIMES.....2 RARELY.....3 NEVER.....4 |
| 526 | Do you give any other injection to malaria patients at your facility? | YES.....1 NO.....2 |
| | A. If yes, Specify | |

| NO | QUESTION | CLASSIFICATION CODE | |
|-----|---|-----------------------|---------------|
| | | MENTIONED | NOT MENTIONED |
| 528 | What factors influence the dosage of the antimalarials you give to your patients? (DON'T PROBE, TICK AS MENTIONED) | | |
| | B. Age of patient | 1 | 2 |
| | G. Weight of the patient | 1 | 2 |
| | H. Standard Treatment Guidelines | 1 | 2 |
| | I. Cost of drug | 1 | 2 |
| | J. Side effects of treatment | 1 | 2 |
| | K. NHIS | 1 | 2 |
| | L. Other, Specify..... | 1 | 2 |
| 529 | Do you refer some of your clients to the health facilities? | YES.....1 NO.....2 | |
| 530 | Do you routinely counsel your clients who have malaria? | YES.....1 NO.....2 | |
| 531 | If you counsel your patients, what do you counsel them on? (DON'T PROBE, TICK AS MENTIONED) | MENTIONED | NOT MENTIONED |
| 532 | F. How to correctly take drugs | 1 | 2 |
| | G. The disease | 1 | 2 |
| | H. Prevention of the disease | 1 | 2 |
| | I. The need for follow-up | 1 | 2 |
| | J. Other, Specify..... | 1 | 2 |

Now I would like to ask a few questions about training and standards and guidelines in this facility

| NO | QUESTION | CLASSIFICATION CODE | | |
|-----|---|------------------------------|----|------------|
| | | Yes seen or reported to have | No | Don't Know |
| 533 | Do you have a copy of the following? (Ask to see a copy) | | | |
| A | National Malaria Drug policy | 1 | 2 | 8 |
| B | Standard Treatment Guidelines | 1 | 2 | 8 |
| C | Malaria Treatment Guidelines | 1 | 2 | 8 |
| D | Malaria Counseling Card | 1 | 2 | 8 |

| | | | | | | |
|-----|--|--|--|--|--|--|
| 534 | What is your current technical qualification? | Pharmacist.....1 Pharmacy Technician.....2 Chemist.....3 Nurse.....4 Community Health Nurse.....5 Other.....99 | | | | |
| 535 | Have you received any training/refresher or follow up on malaria case management? If Yes: When did you receive the last training? | YES.....1 NO.....2 Month..... Year <table border="1" data-bbox="1015 611 1382 684"> <tr> <td style="width: 25px; height: 25px;"></td> <td style="width: 25px; height: 25px;"></td> <td style="width: 25px; height: 25px;"></td> <td style="width: 25px; height: 25px;"></td> </tr> </table> | | | | |
| | | | | | | |
| 536 | Do you feel you need additional training in order to be able to manage malaria better? | YES.....1 NO.....2 | | | | |

IEWER'S COMMENTS:

Form D.3 Facility Audit Checklist (Outpatient Department- Consultation Area)

| | |
|---|---|
| FIND THE MANAGER OR THE MOST SENIOR PERSON IN CHARGE OF THE OUT PATIENT DEPARTMENT. INTRODUCE YOURSELF AND READ THE FOLLOWING: | |
| <p>I am a student of the University of Ghana School of Public Health. As part of my MPhil dissertation, I am collecting data on how uncomplicated malaria is managed at health facility level in the district. The information generated will be useful to you, your facility, the DHMT in planning your health service delivery. This part of the study will review pharmacy practices in relation to malaria case management.</p> <p>All information collected from this survey will be confidential and answering the questions is voluntary. You can refuse to answer any question. No identifying information of respondents will be collected in this study. I am asking for your assistance to ensure accurate information is collected. Should there be any person who is most appropriate in providing me any other information; I would appreciate your introducing me to that person</p> <p>.Do you have any questions for me? Can we begin now?</p> | |
| 600 | SIGNATURE OF INTERVIEWER INDICATES PARTICIPANT'S AGREEMENT TO PARTICIPATE AND THAT THE TIME IS CONVENIENT |

| NO | QUESTION | CLASSIFICATION CODE | | GO TO |
|-----|---|---|---------------------------|-------------------|
| | | Routinely Done | Not Routinely Done | |
| 601 | Is there a routine system where patients are seen prior to the consultation with the prescriber? .eg History Table? | Yes.....1 No.....2 Don't Know.....8 | | 2 OR 8 → 603 |
| 602 | Assess which activities are routinely done at the facility | Routinely Done | Not Routinely Done | Don't Know |
| A | Take temperature of patients | 1 | 2 | 8 |
| B | Take weight of patients | 1 | 2 | 8 |
| C | Take blood pressure of patients | 1 | 2 | 8 |
| D | Sponge febrile children | 1 | 2 | 8 |
| E | Give paracetamol to febrile children prior to consultation | 1 | 2 | 8 |
| F | Assess immunization status of children | 1 | 2 | 8 |
| G | Take initial history from patients | 1 | 2 | 8 |
| H | Other,Specify..... | 1 | 2 | 8 |

| NO | QUESTION | CLASSIFICATION CODE | | |
|-----------|---|---|-----------|-------------------|
| 603 | Are records kept for all malaria patients? | Yes.....1 No.....2 Don't Know.....8 | | |
| 604 | Are separate records kept for all malaria patients? | Yes.....1 No.....2 Don't Know.....8 | | |
| 605 | Do you have the following equipment in the OPD? | Yes | No | Don't Know |
| A | Thermometer | 1 | 2 | 8 |
| B | Adult Weighing scale | 1 | 2 | 8 |
| C | Child weighing scale(Hanging Salter Scale) | 1 | 2 | 8 |
| D | Infant Weighing Scale | 1 | 2 | 8 |
| E | Examination Light Source/ Torchlight | 1 | 2 | 8 |
| F | Patella Hammer | 1 | 2 | 8 |

INTERVIEWER'S COMMENTS: