Uganda National Malaria Control Program: Analysis of Malaria Attendances According to Coartem Dosage Age Groups, March 2007

March 2007

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CONTENTS

THE SURVEY TEAM v

ACRONYMS vii

ACKNOWLEDGMENTS ix

EXECUTIVE SUMMARY xi

INTRODUCTION 1

JUSTIFICATION 3

OBJECTIVES 5
General Objective 5

METHODOLOGY 7
Sampling 7
Study Design 7

RESULTS 9
The Proportion of OPD Attendances Due to Malaria Corresponding to Coartem Dosage Age Groups 9
Outpatient New Attendances due to Malaria versus Total New Outpatient Attendances (for all diseases) 12
Contribution of Coartem Prescriptions to the Total Malaria Prescriptions in 2006 13
Figure 6. Coartem prescriptions compared tototal malaria prescriptions in 2006. 14
Extent of Coartem Stock-Outs in 2006 after Introduction into Health Facilities 14
The Proportion of Positive Blood Smears in 2006 15
The Availability of Treatment Guidelines and Work Aids in Health Facilities 17
The Availability Pattern of Coartem in Health Facilities 18
The Proportion of Health Workers Trained on the New Malaria Treatment Policy 20

COMMENTS BY HEALTH WORKERS 21
Successes and Positive Experiences Mentioned by Respondents 21
Constraints/Negative Experiences Mentioned by Respondents 21

DISCUSSION 23

RECOMMENDATIONS 25

ANNEX 1. LIST OF HEALTH FACILITIES SURVEYED AND THEIR IN-CHARGES 27

ANNEX 2. DATA COLLECTION TOOL 29

ANNEX 3. FORMS 31

THE SURVEY TEAM

This survey was conducted during February and March 2007 for the National Malaria Control Programme (NMCP) with financial and technical support from USAID/PMI through MSH/RPM Plus. The team which carried out the survey was composed of the following:

1. Dr. Kato, Senior Medical Officer, NMCP, MoH (Team Leader)
2. Dr. Ssebadduka, Medical Officer, Kitagata Hospital
3. Dr. Akena, Lecturer, Makerere University Medical School
4. Mr. Buyinza, Scientific Officer, Vector Control Division, MoH
5. Mr. Eguma, Entomologist, Vector Control Division, MoH

ACRONYMS

ACT	artemisinin-based combination therapy
AIDS	acquired immunodeficiency syndrome
GH	General Hospital
HIV	human immunodeficiency virus
HC II	health center level II
HC III	health center level III
HC IV	health center level IV
HIV	human immunodeficiency virus
JMS	Joint Medical Stores
MoH	Ministry of Health
MSH	Management Sciences for Health
RPM	Rational Pharmaceutical Management Plus
NMS	National Medical Stores
NRH	National Referral Hospital
OPD	outpatient department
PMI	President's Malaria Initiative
PNFP	private not-for-profit
RRH	Regional Referral Hospital
USAID	U. S. Agency for International Development

ACKNOWLEDGMENTS

The Ministry of Health National Malaria Control Programme acknowledges with thanks all those who contributed towards the planning of the survey, collection and analysis of the data, and preparation of this report. Special thanks go to U.S. Agency for International Development, the President's Malaria Initiative, and Management Sciences for Health Rational Pharmaceutical Management Plus for funding this survey and providing technical assistance. The Ministry of Health also thanks the survey team, District Health Officers, District Malaria focal persons, and other members of the District Health Management Teams, health facility in-charges, and health workers within the health facilities for their cooperation and participation in the survey.

EXECUTIVE SUMMARY

In April 2005, the Uganda Ministry of Health (MoH) changed the malaria treatment policy to make arteminisin-based combination therapies (ACTs) the first-line medicines for uncomplicated malaria. Artemether/lumefantrine (Coartem®) was the ACT selected as the first-line treatment for uncomplicated malaria. Implementation of the new policy in April 2006 required the quantification of Coartem needs, but information was needed for rational quantification, ordering, and use of Coartem.

Therefore, a survey team, funded and technically assisted by Management Sciences for Health (MSH) Rational Pharmaceutical Management (RPM) Plus, visited 20 districts to analyze health facility records. The information provided from this health facility records analysis will be useful to those who have the responsibility of quantifying and ordering this ACT.

The Coartem dosage age group with the largest proportion of malaria attendances was that of patients aged 12 years and older, 46 percent; followed by 4 months to 3 years; followed by 7 years to 12 years; followed by 3 years to 7 years.

The overall proportion of new malaria attendances for the years 2005 and 2006 combined was 37 percent of the total new attendances. In both years, the malaria attendances increased from around March/April, reached a peak around June/July and then returned to the level of March/April around August/September and tended to rise again during December/January.

The overall proportion of Coartem prescriptions was 56 percent of all malaria prescriptions; including the periods after April when Coartem was out of stock in some health facilities. All dosage types of Coartem were out of stock at one time or other, with brown most frequently out of stock and yellow least often out of stock. Health centers were more likely to be out of stock than hospitals.

Overall, 39 percent of all blood slides examined for malaria parasites were positive. Generally, there was a higher probability of a slide being positive among the younger age groups compared to the older age groups; and it was also higher among patients in health centers than among patients in hospitals.

Management of Uncomplicated Malaria[1] was the most widely available guideline, while Malaria Treatment Policy Chart [2] was the least available. All the five guidelines were more widely available in hospitals than in health centers.

The overall proportion of health workers who had been trained on the new malaria treatment policy was 93 percent.

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[1] Republic of Uganda. 2005. *Management of Uncomplicated Malaria: aPractical Guide for Health Workers*. 3rd ed. Kampala: Ministry of Health.
[2] Republic of Uganda. 2005. *Treatment For Uncomplicated and Severe Malaria: A Guide for Health Workers*. 2nd ed. Kampala: Ministry of Health.

To quantify their needs of Coartem, the survey team recommends that health facilities should analyse their records and determine the proportions of malaria attendances corresponding to Coartem dosage age groups. Otherwise, the following proportions could be used—

- 4 months to 3 years—28 percent
- 3 years to 7 years —13 percent
- 7 years to 12 years—13 percent
- 12 years and older— 46 percent

To increase the proportion of Coartem prescriptions—

- Health facilities should try to avoid Coartem stock-outs
- Health workers not trained on the new malaria treatment policy should be trained
- Guidelines and work aids should be made more widely available
- All prescribers should be encouraged through circulars, workshops, and mass media to prescribe Coartem as first-line treatment for uncomplicated malaria

INTRODUCTION

Malaria causes more morbidity and mortality than any other disease in Uganda. The most vulnerable people are pregnant women; children aged less than five years; people living with HIV/AIDS; and travellers from areas with little or no malaria transmission. One of the factors contributing to the burden of malaria is the increasing resistance of *Plasmodium falciparum* to the relatively inexpensive antimalarial medicines (chloroquine and sulfadoxine-pyrimethamine). Due to this resistance, the Uganda Ministry of Health (MoH) changed the malaria treatment policy to make arteminisin-based combination therapies (ACTs) the first-line medicines for uncomplicated malaria. Artemether/lumefantrine (Coartem) was the ACT selected as the first-line medicine and with artesunate/amodiaquine as an alternative first-line for uncomplicated malaria. The decision to change the policy was made on May 17, 2004, and the new policy was officially launched on April 25, 2006, by the Rt. Hon. Prime Minister of Uganda Professor Apollo Nsibambi. Implementation of the new policy involved many activities including the quantification of Coartem requirements.

To analyse the available OPD, laboratory, stores and personnel records in health facilities to obtain information for rational quantification, ordering, and use of Coartem in Uganda, a survey, funded by Management Sciences for Health (MSH)/ Rational Pharmaceutical Management (RPM) Plus, was carried out in 20 districts. The survey was begun on February 5, 2007, and completed on March 20, 2007.

JUSTIFICATION

The variety of Coartem bought by the MoH for use in public and private-not-for-profit (PNFP) health facilities is pre-packed by the manufacturer (Novartis Pharmaceuticals) in blisters according to the dosage age groups and color codes (Table 1). To quantify and order for each type of Coartem dosage blister, reliable information on the proportions of malaria attendances corresponding to the dosage weight/age groups at health facilities is needed. However, the available HIMS reports show only two age groups (i.e., below five years of age and above five years). This is not sufficient information for health workers to make rational orders and may lead to overestimation or underestimation of the requirements at national and health facility level. The information provided from this analysis of outpatient department (OPD) registers will be useful to health workers and managers who have the responsibility of ordering Coartem.

Some health workers were not trained on the new malaria treatment policy because either they were absent or not yet recruited. This makes their prescribing practices less compliant to the national malaria treatment policy. Even those who were trained do not always prescribe according to the new treatment guidelines. The information provided by this analysis will assist managers in planning future training and/or re-training of health workers on the new malaria treatment policy.

There were periods when Coartem was out of stock after it had been introduced into health facilities, making implementation of the new malaria treatment policy inconsistent.

Treatment of uncomplicated malaria is mainly presumptive. Any patient with fever or a history of fever within the last 24 hours without evidence of other diseases is treated for malaria. Analysis of laboratory reports indicates that a proportion of patients treated for malaria had parasitemia. This information may be useful in deciding future treatment policy.

Table 1. Coartem Dosage Weight/Age Groups and Color Codes

Weight (Kg)	Age	Tablets per Treatment Course	Color Code*
5–14	From 4 months to 3 years	6 x 1 tablets	Yellow
15–24	From 3 years to 7 years	6 x 2 tablets	Blue
25–34	From 7 years to 12 years	6 x 3 tablets	Brown
> 35	12 years and above	6 x 4 tablets	Green

*Color codes correspond to the pack sizes for the different age groups.

OBJECTIVES

General Objective

The general objective was to analyse health facility records to rationalise the quantification, ordering, and use of Coartem in Uganda. Specifically, the survey was done to determine the—

- Proportion of OPD attendances due to malaria corresponding to dosage age groups in 2005 and 2006
- Contribution of malaria OPD attendances to the total new OPD attendances (all diseases) in 2005 and 2006
- Proportion of Coartem prescriptions out of the total malaria prescriptions in 2006
- Proportion of days when Coartem was out of stock in 2006 after it had been introduced into health facilities
- Proportion of positive blood smears for malaria parasites by age group in 2006
- Availability of treatment guidelines and work aids in health facilities in February–March 2007 (at the time of the survey)
- Availability of Coartem in health facilities
- Proportion of health workers trained on the new malaria treatment policy

METHODOLOGY

Sampling

Twenty districts were selected taking into account regional representation so that five districts were selected from each of the four country regions (north, eastern, central, and western). The choice of districts from a particular region depended on the different levels of malaria endemicity in Uganda (Figure 1).

Selection of health facilities in a particular district was based on availability of OPD, laboratory, and stores records for 2005 and 2006. In each district, health facilities that had records were randomly selected for the survey. For districts with hospitals, one hospital, one health center (HC) level IV[3] , one HC III, and one HC II were selected; and for districts without hospitals, one HC IV, two HC III, and one HC II were selected. Altogether 80 health facilities were selected (Table 2).

Table 2. Numbers of health facilities surveyed by service level

Level of Health Facility	Number of Health Facilities Surveyed
National Referral Hospital (NRH)	1
Regional Referral Hospital (RRH)	8
General Referral Hospital (GH)	10
HC IV	19
HC III	22
HC II	20
TOTAL	**80**

Study Design

To collect the data, a set of forms were provided by the National Malaria Control Programme. Information was obtained by interviewing health workers and abstracting data from health facility records. The data was then put into Excel spreadsheets.

[3] The Health System in Uganda has a referral structure starting with community level as Health center I, Health center II serves the parish level, up to health center IV whose catchment area is the subcounty. The next level is a district hospital

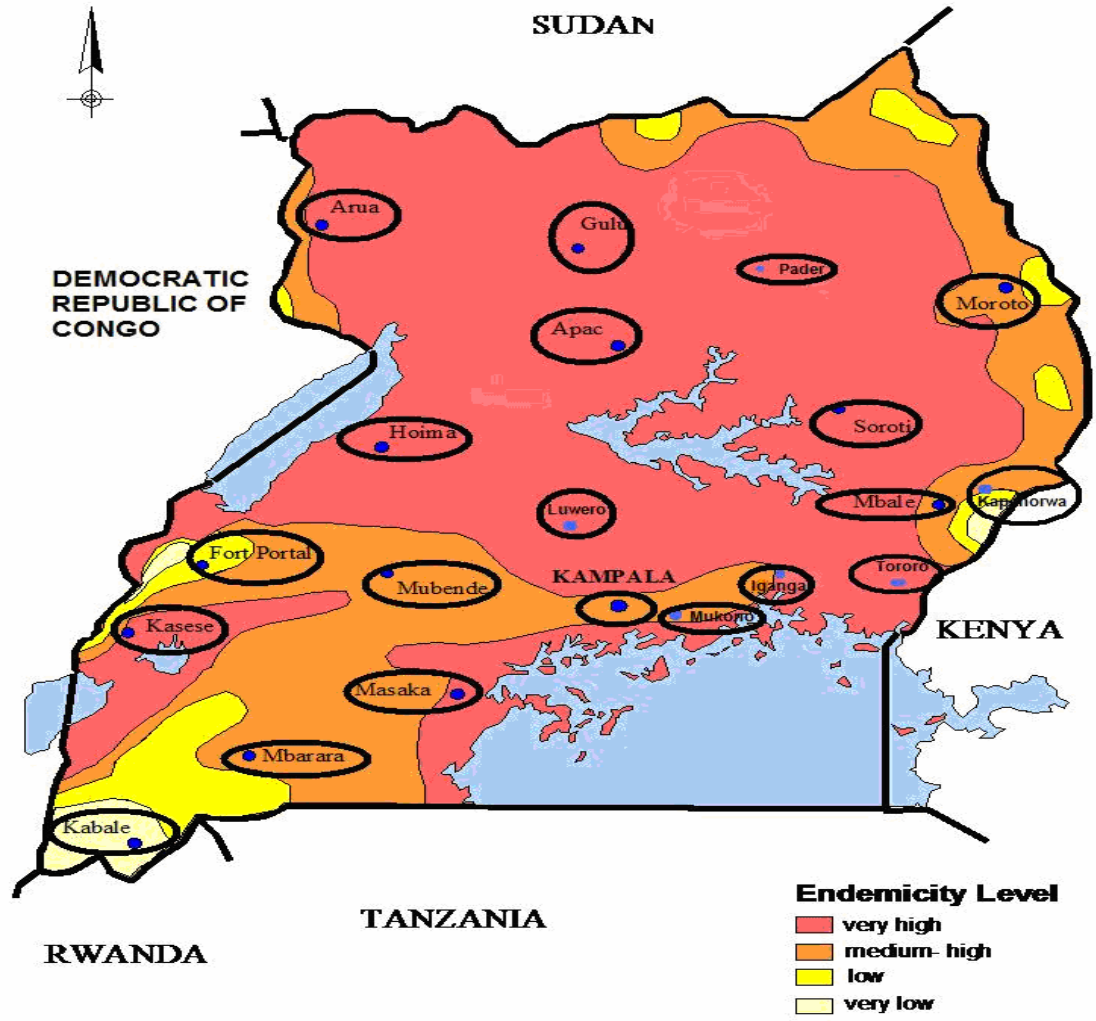

Figure 1. Map of Uganda showing malaria endemicity and location of districts where the survey was done.

RESULTS

The Proportion of OPD Attendances Due to Malaria Corresponding to Coartem Dosage Age Groups

The health facilities outpatient registers for the period January 2005 to December 2006 were retrieved; and the new attendances due to malaria corresponding to the Coartem dosage age groups were counted and recorded.

OPD Attendances in 2005

The total new attendances in 2005 in all the health facilities were 1,699,002, of which 642,536 (38 percent) were due to malaria (Table 3). The Coartem dosage age group with the largest proportion of malaria attendances was that of patients aged 12 years and older (45 percent); followed by the other age groups in decreasing percertages—patients aged 4 months to 3 years (29 percent); patients aged 7 years to 12 years (14 percent); patients aged 3 years up to 7 years (12 percent).

In case of the National Referral Hospital (Assessment Centre, Mulago), the pattern of malaria attendances recorded was unusual. The Coartem dosage age group with the highest proportion of attendances was patients aged 4 months to 3 years instead of 12 years and above as is the case in all other health facilities.

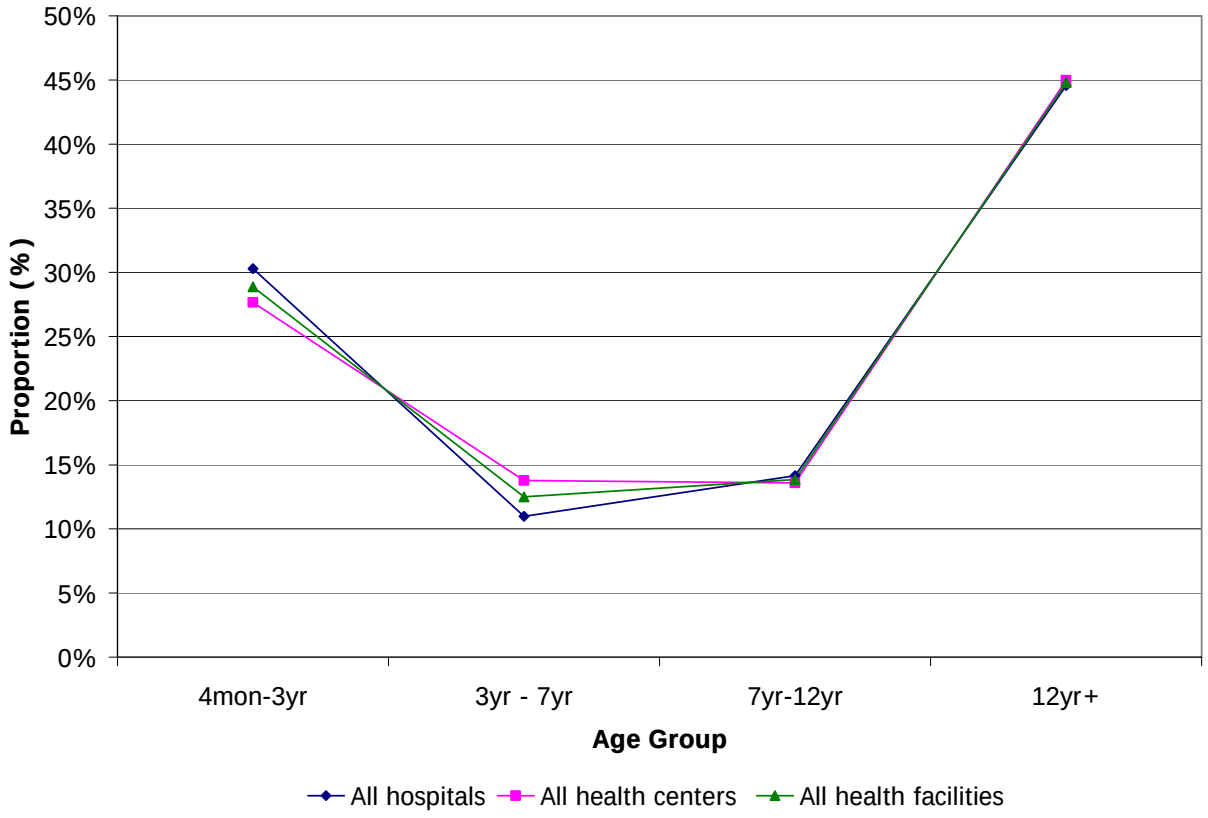

Figure 2. Proportions of OPD Malaria Attendances Corresponding to Coartem Dosage Age Groups by Health Facility Level in 2005

OPD Attendances in 2006

The pattern of OPD attendances in 2006 was generally similar to that of 2005. The total new attendances were 1,805,580 of which 642,768 (36 percent) were malaria attendances. The Coartem dosage age group with the largest proportion of malaria attendances was that of patients aged 12 years and older (47 percent) followed by the other age groups in decreasing percertages— patients aged 4 months to 3 years (28 percent); patients aged 7 years to 12 years (13 percent); patients aged 3 years to 7 years (13 percent) (Figure 3).

As in 2005, the age group in the Assessment Centre Mulago with the highest proportion of attendances was that of patients aged 4 months to 3 years instead of 12 years and older.

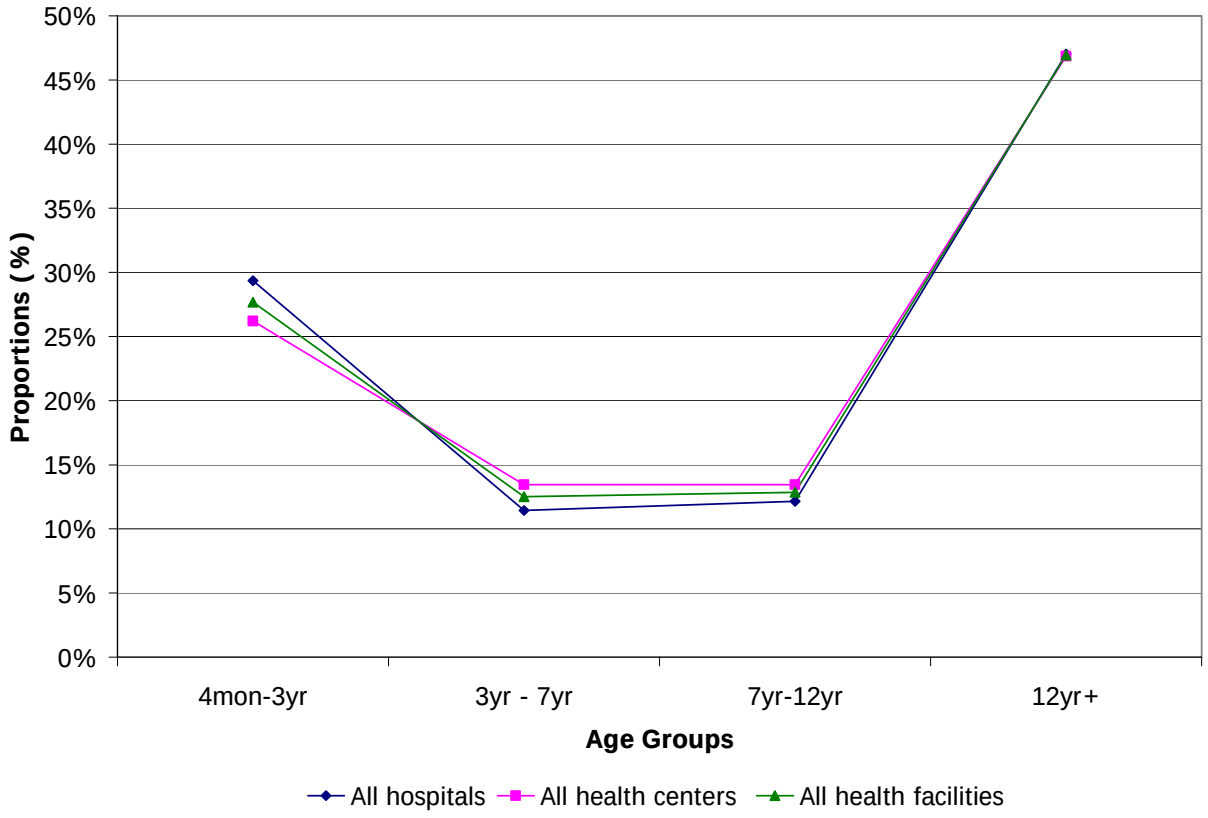

Figure 3. Proportions of OPD malaria attendances corresponding to Coartem dosage age groups by health facility level in 2006.

OPD Attendance in 2005 and 2006 Combined

When the attendances of 2005 and 2006 were combined, the overall proportions were similar to those of the individual years. The total new attendances were 3,557,224 of which 1,318,976 (37 percent) were due to malaria. The Coartem dosage age group with the largest proportion of malaria attendances was that of patients aged 12 years and older (46 percent) followed by the other age groups in decreasing percertages—4 months to 3 years (28 percent); 7 years to 12 years (13 percent); 3 years to 7 years (13 percent) (Figure 4).

As was the case in the individual years, the Coartem dosage age group with the largest proportion in 2005–2006 attendances of the Mulago Assessment Centre was that of patients aged 4 months to 3 years instead of that of patients aged 12 years and older.

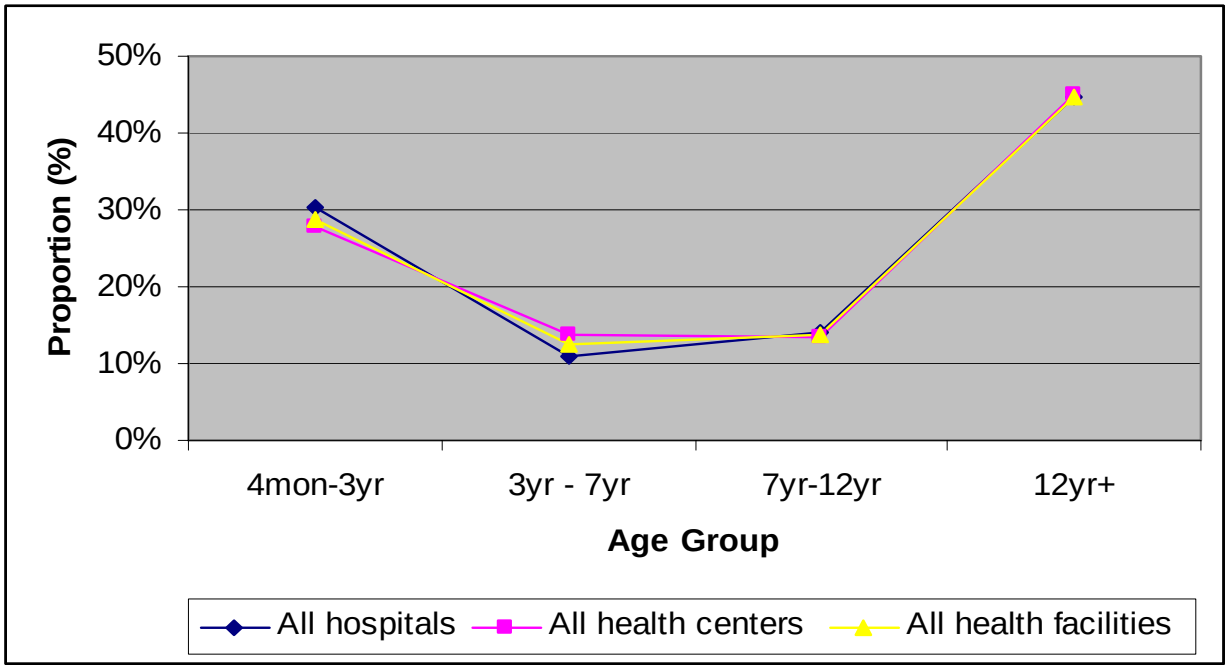

Figure 4. Proportions of OPD malaria attendances corresponding to Coartem dosage age groups by health facility level in 2005 and 2006 combined.

Outpatient New Attendances due to Malaria versus Total New Outpatient Attendances (for all diseases)

The total number of new outpatient attendances in 2005 was 1,699,002 of which 642,536 (38 percent) were due to malaria; and in 2006 the total new attendances were 1,858,222 of which 676,440 (36 percent) were due to malaria. The total new attendances for the two years combined were 3,557,224 of which 1,318,976 (37 percent) were due to malaria.

The total number of malaria attendances varied from month to month. In both years, attendences started increasing in March–April, reaching a peak around June–July, returned to the March–April level around August–September, and tended to rise again during December–January the previous around August–September, and tended to rise again during December–January. The pattern of total new attendances was similar to that of malaria attendances (Figure 5).

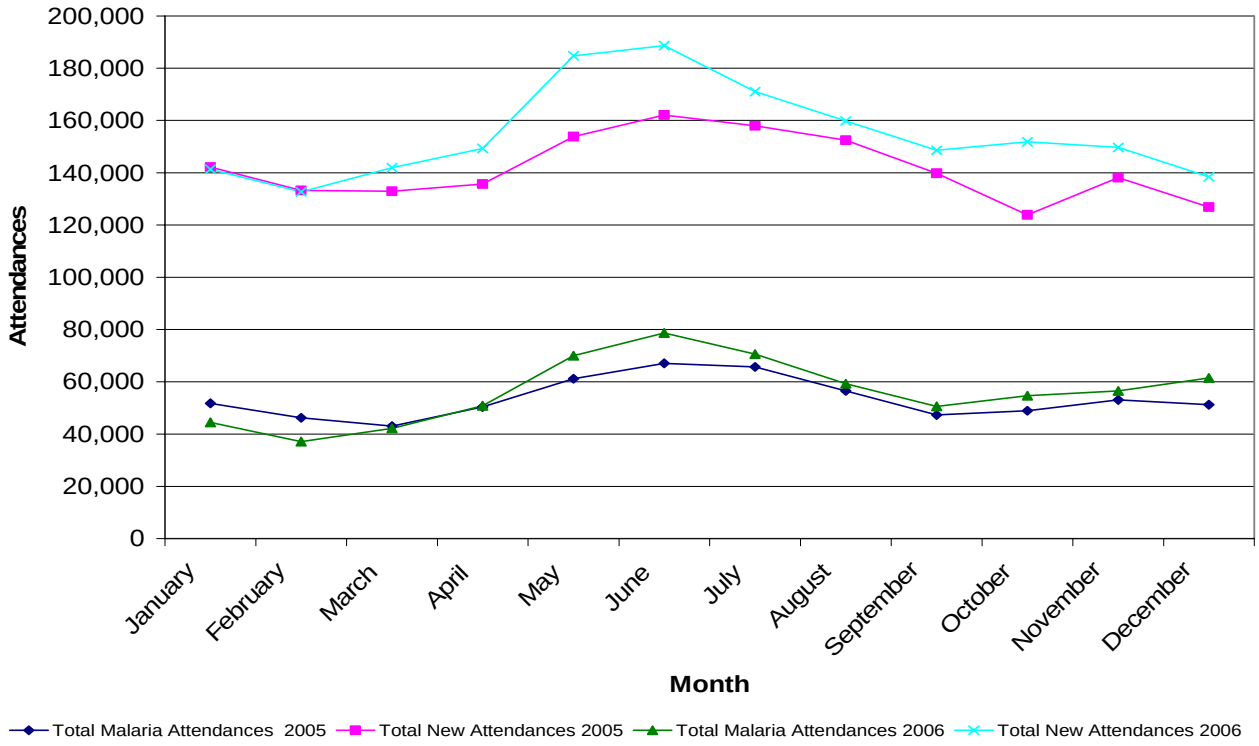

Figure 5. OPD attendances due to malaria as compared to total new attendances, 2005–2006.

Contribution of Coartem Prescriptions to the Total Malaria Prescriptions in 2006

The total number of malaria prescriptions from April to December 2006 (after Coartem became available in health facilities) was 552,678; Coartem prescriptions counted for 308,418 (56 percent). This includes the periods when the medicine was out of stock at health facilities level.

The proportion of Coartem prescriptions increased from April (12 percent), peaking in June (58 percent), and declining slightly in August (55 percent) (Figure 6). From September (with 67 percent), the proportion of prescriptions increased slightly by November (68 percent). In general, the pattern of Coartem prescriptions tended to follow the trend of total malaria prescriptions.

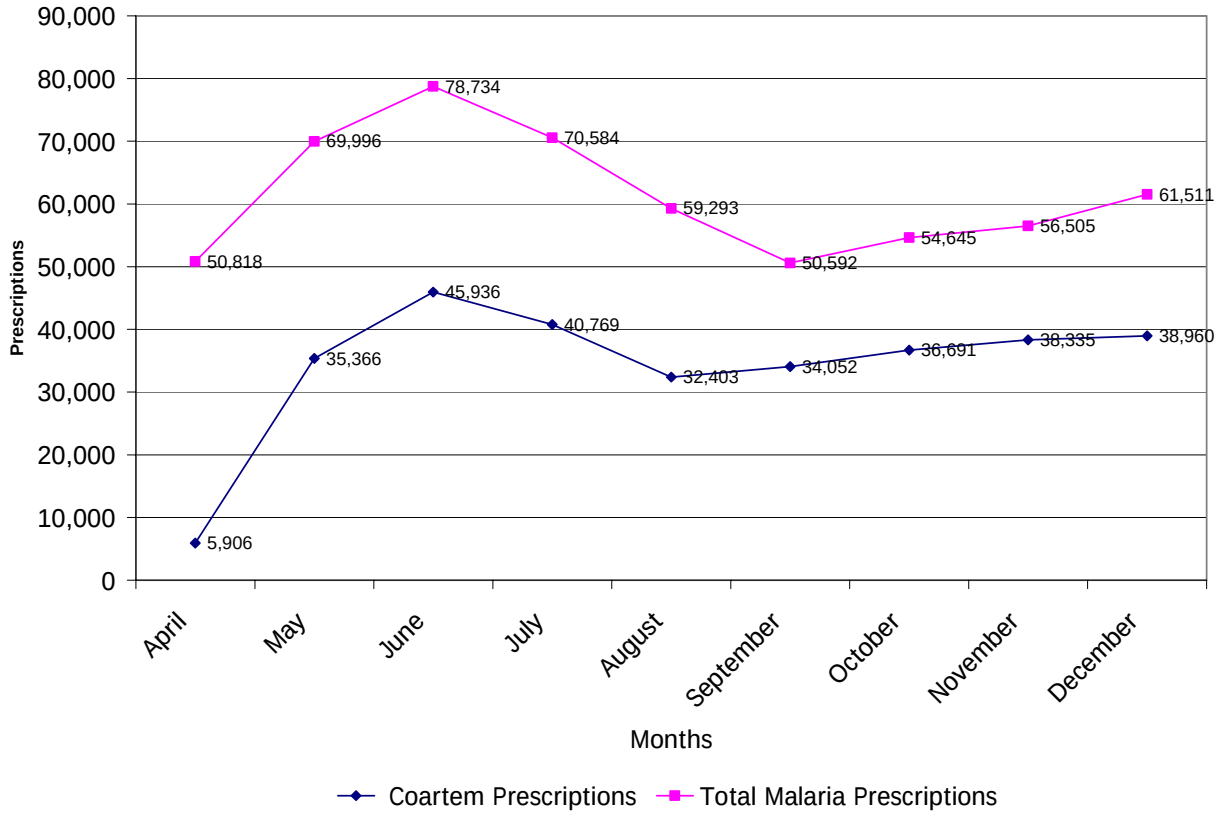

Figure 6. Coartem prescriptions compared tototal malaria prescriptions in 2006.

Extent of Coartem Stock-Outs in 2006 after Introduction into Health Facilities

Coartem became available in health facilities in March–April 2006. The data used in this report cover the period from April to December 2006 (i.e., 9 months or 275 days).

The number of health facility days was calculated by multiplying 275 days by the number of health facilities; and the proportion of days when Coartem was out of stock was calculated by dividing the days when the medicine was out of stock by the total number of health facility days. For example, for the 8 regional referral hospitals, the total number of facility days was = 8 x 275 = 2,200, of which Coartem was out of stock for 178 facility days. Therefore, the proportion of facility days when Coartem was out of stock was (178/2,200) x 100 = 8 percent.

In the 18 hospitals, the total number of health facility days was 4,950 out of which Coartem–brown had the highest proportion of health facility days out of stock (3 percent); followed by green, yellow, then blue.

In the 58 health centers, the total number of health facility days was 15,950 out of which Coartem–brown had the highest proportion of health facility days out of stock (18 percent); followed by green, blue, then yellow.

Overall, the number of health facility days for all the 76 health facilities combined was 20,900 out of which Coartem–brown was out of stock for 3,063 (15 percent) health facility days; followed by green with 2,439 (12 percent); blue with 2,012 (10 percent); and yellow with 1,972 (9 percent).

The probability of Coartem being out of stock was higher in health centers than in hospitals (Figure 7).

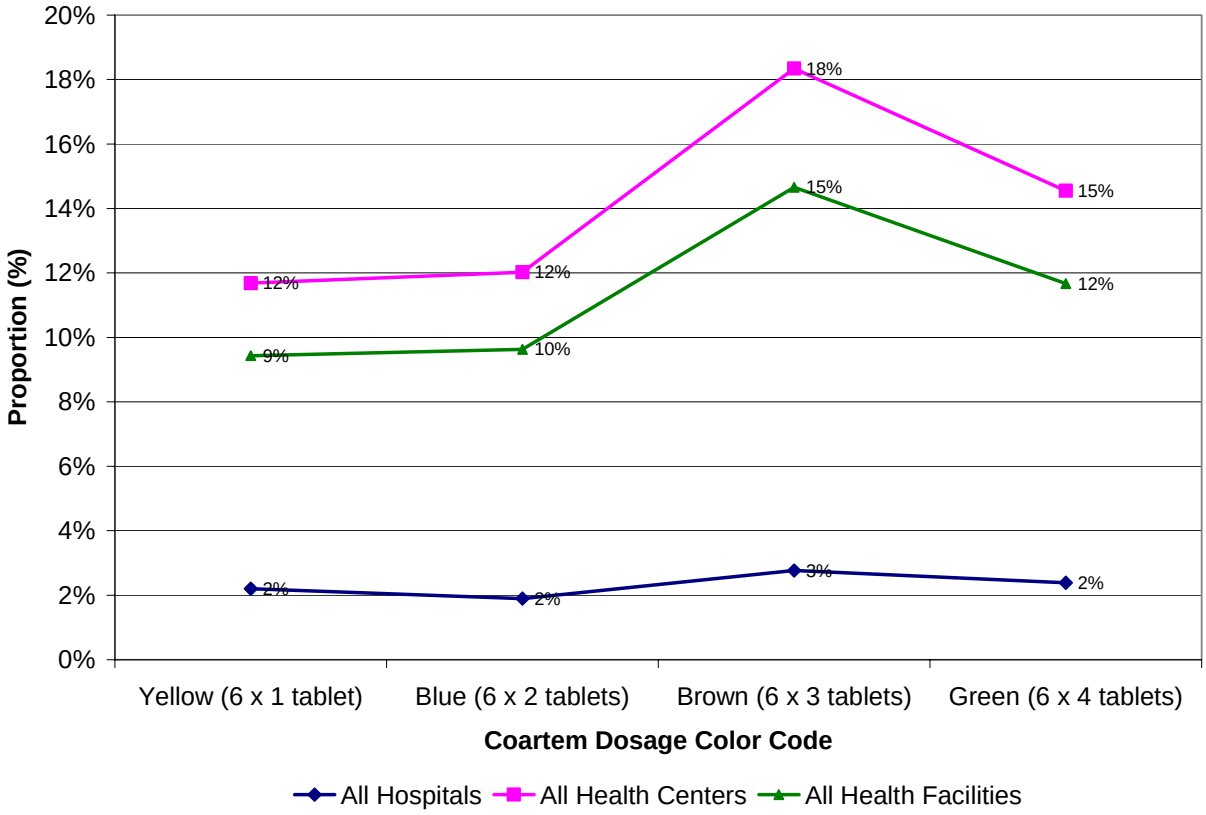

Figure 7. Proportion of health facility days between April and December 2006 when Coartem was out of stock.

The Proportion of Positive Blood Smears in 2006

The laboratory records of 42 health facilities including one National Referral Hospital, 7 Regional Referral Hospitals, 16 HC IV, and 10 HC III were analysed to determine the proportions of malaria parasite positive blood slides.

In the hospitals, the total number of blood slides examined for malaria parasites was 139,673 out of which 47,491 (34 percent) were positive. The patients aged 4 months to 3 years had the highest proportion of positive blood slides with 15,433 (41 percent) positive slides out of 37,344 slides examined; followed by the other age groups in decreasing percertages—3 years to 7 years

with 6,319 (37 percent) positive slides out of 16,893; 7 years to 12 years with 4,825 (32 percent) positive out of 15,292; and 12 years and older with 20,914 (30 percent) positive out of 70,144.

In the health centers, 53,080 was the total number of blood slides examined for malaria parasites out of which 28,525 (54 percent) were positive. The patients aged 3 years to 7 years had the highest proportion of positive blood slides—4,818 (61 percent) of 7,839 slides examined; followed by the other age groups in decreasing percertages—4 months to 3 years with 9,940 (59 percent) positive slides out of 16,791; 7 years to 12 years with 2,857 (59 percent) positive out of 20,145; followed by 12 years and older with 10,910 (46 percent) positive out of 93,741.

Overall, in all the health facilities that had laboratory records analysed, the total number of blood slides examined for malaria parasites was 139,673 out of which 76,016 (39 percent) were positive. The age group of patients aged 4 months to 3 years had the highest proportion of positive blood slides with 25,373 (47 percent) positive slides out of 54,135 slides examined; followed by the other age groups in decreasing percertages—3 years to 7 years with 11,137 (45 percent) out of 24,732 positive slides; 7 years to 12 years with 7,682 (38 percent) slides out of 20,145; 12 years and older with 31,824 (34 percent) slides out of 93,741.

Generally, the probability of a slide being positive was higher among the younger age groups than among the older age groups; and it was also higher among health center patients than among hospital patients.

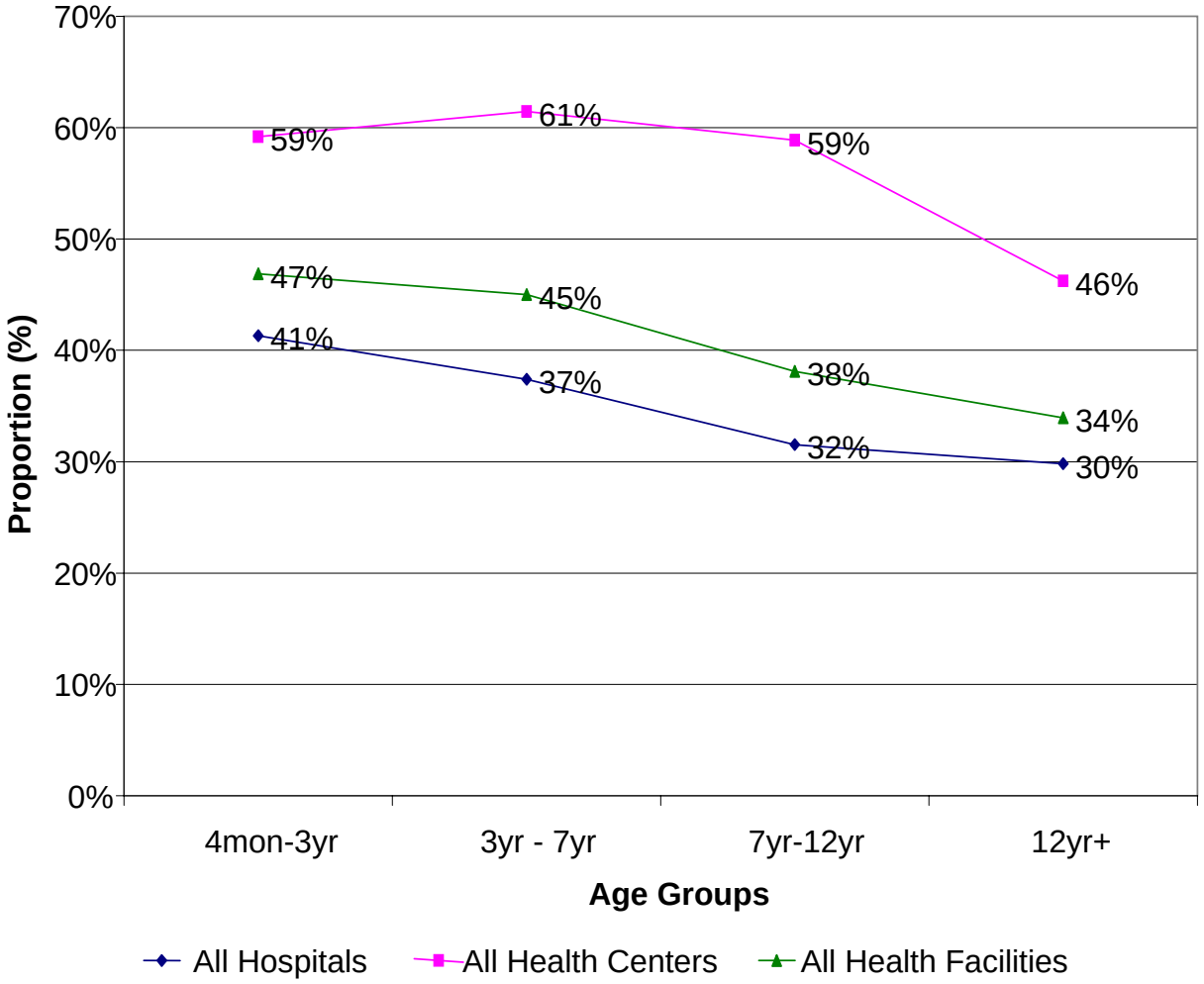

Figure 8. Proportion of positive blood smears for malaria parasites by health facility level and age group.

The Availability of Treatment Guidelines and Work Aids in Health Facilities

The records of 76 health facilities showed that the guideline entitled *Management of Uncomplicated Malaria, 3rd Edition, December 2005,* was the most widely available guideline, while Malaria treatment policy Chart, 2nd Edition, December 2005 was the least available.

All the five guidelines were more widely available in hospitals than in health centers. Hospitals had individual guidelines available from 93 to 100 percent of the time while health centers' availability ranged from 48 to 89 percent.

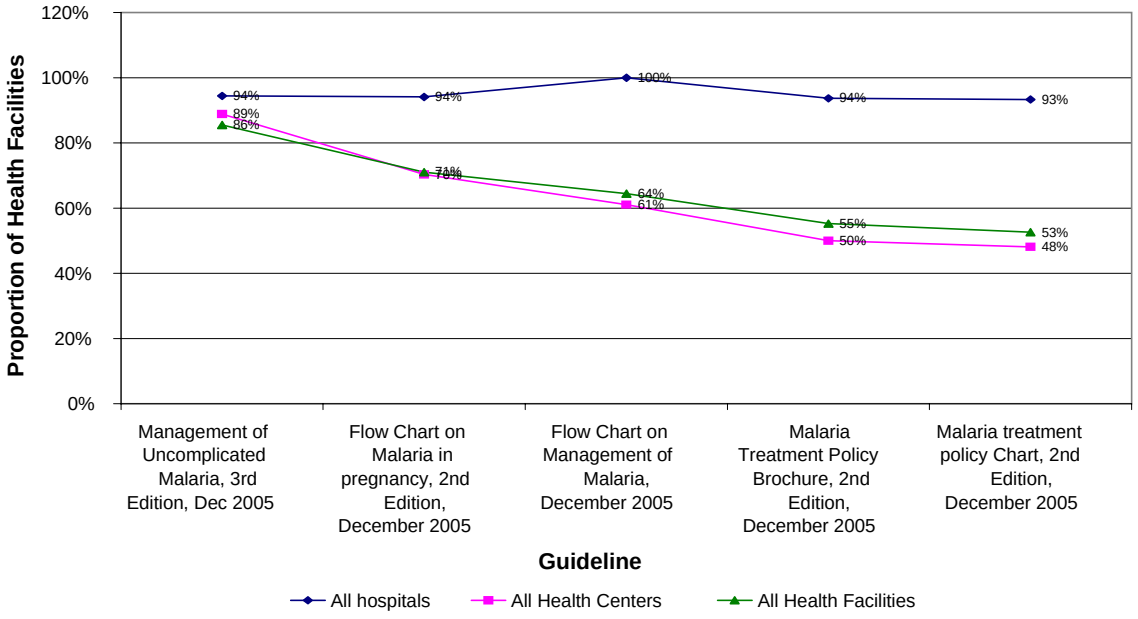

Figure 9. Proportion of health facilities with individual guidelines available.

The Availability Pattern of Coartem in Health Facilities

Overall, the total number of Coartem treatment courses received by the health facilities in 2006 was 308,418. The most plentiful was green (12 years and older) with 153,099 (50 percent); followed by yellow (4 months to 3 years) with 86,284 (28 percent); followed by blue (3 years to 7 years) with 40,440 (13 percent); and then brown (7 years to 12 years) with 28,595 (9 percent). This pattern was similar in hospitals and health centers.

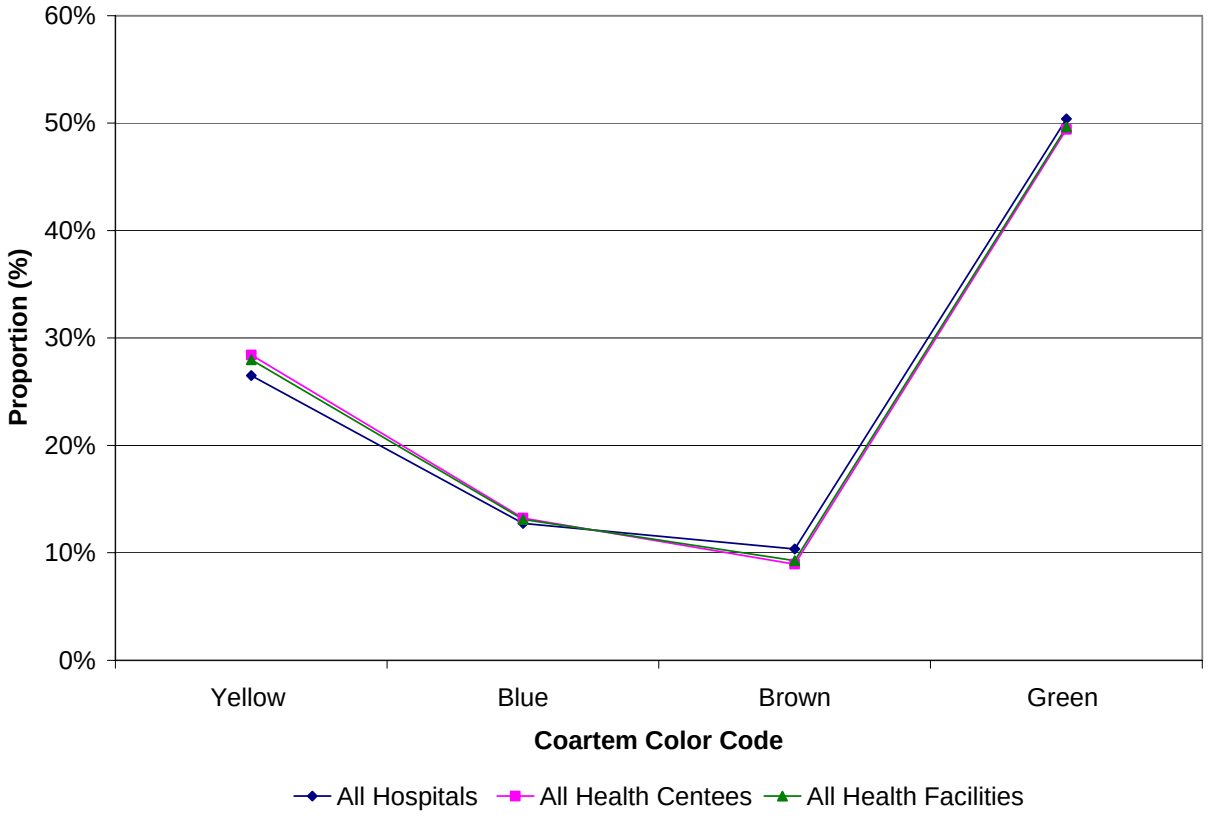

Figure 10. Proportions of Coartem received by health facilities by dosage color code.

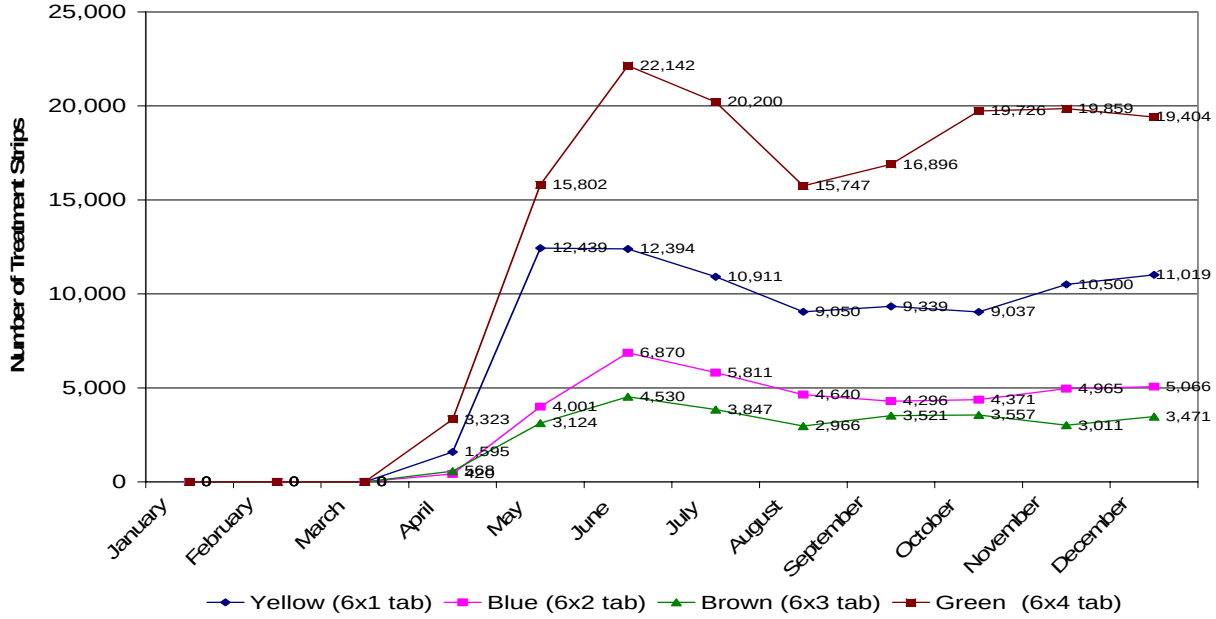

Figure 11. Availability of Coartem by month and dosage code.

The Proportion of Health Workers Trained on the New Malaria Treatment Policy

Some of the health facilities did not have copies of the reports on the training of health workers on the new malaria treatment policy (including the proper use of Coartem) which was done between March and May 2006. The health facilities which provided the information were 3 RRH, 6 GH, 18 HC IV, 20 HC III, and 19 HC II.

The total number of health workers in the 9 hospitals was 1,131 of whom 1,066 (94 percent) had been trained; in the 57 health centers, the total number of health workers was 783 of whom 723 (92 percent) had been trained. The overall number of health workers in all the 66 health facilities combined was 1,914 of whom 1,789 (93 percent) had been trained.

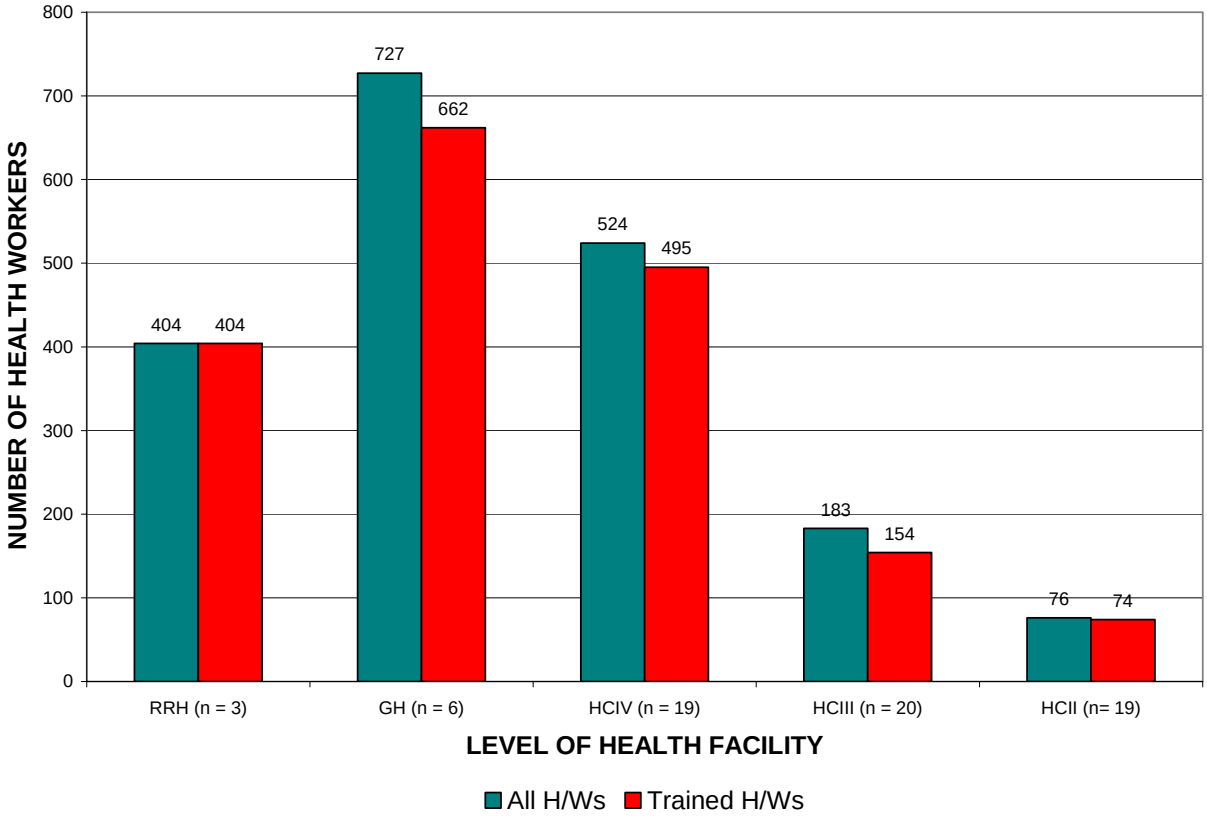

Figure 12. Number of Health Workers Trained in New Malaria Treatment Policy by Health Facility Level

COMMENTS BY HEALTH WORKERS

Successes and Positive Experiences Mentioned by Respondents

Comment	Frequency	%
The drug (Coartem) cures	40	20
The drug has no side effects	31	15
Training on the new malaria treatment policy was successful	29	14
Availability of the drug increased OPD attendance	21	10
The drugs is readily available	20	10
The drug is easy to swallow	19	9
Special packaging of Coartem facilitates easy dispensing and compliance	19	9
Other comments	22	11
Total	**201**	**100%**

Constraints/Negative Experiences Mentioned by Respondents

Comment	Frequency	%
Drug stock outs	28	21
Coartem has too many tablets per treatment course	22	16
There is no injectable Coartem for patients who vomit	9	7
Insufficient IEC materials and training	9	7
Return of fever after a short time	7	5
Insistence on Coartem by some patients	6	4
Some side effects	4	3
Faking malaria to get drugs	3	2
Presumptive treatment	2	1
Too much publicity of Coartem, leading to political interference	2	1%
Other comments: sharing medicines/taking medicines with high-fat foods or milk	44	32%
Total	**136**	**100%**

DISCUSSION

The proportions of malaria attendances corresponding to Coartem age groups were similar to those in the general population of Uganda as reported in the 2002 census (Table 3). However, the proportion of malaria attendances for the age group of younger than three years in the survey is higher than that in the general population. This is because children aged less than three years have a lower immunity to the disease and tend to get more attacks of malaria than older children and adults.

Conversely, the proportion of malaria attendances for adults in the survey is lower than the proportion for the general population because adults get relatively fewer episodes of the disease than children.

Table 3. Uganda Population Distribution by Coartem Age Group according to the 2002 Census as compared to distribution of malaria attendances in the survey

Age group (years)	Proportion of the population corresponding to Coartem age groups, % (2002 Census)	Proportion of malaria attendances corresponding to Coartem age groups, %
0-3	17	28
4-7	13	13
8-11	12	13
12+	58	46
Overall	**100%**	**100%**

The observed variation in malaria attendances in 2005 and 2006 was expected because malaria cases tend to increase 6–8 weeks following the peak of the rains. The increases in malaria attendances contributed to the increases in the total new attendances.

The proportion of Coartem prescriptions was only 56 percent for several reasons—

- Health workers prescribed other antimalarial medicines when Coartem was out of stock
- There were stocks of other antimalarial medicines which the health workers did not want to go to waste
- Some health workers mistakenly thought that Coartem should be used after other antimalarial medicines such as chloroquine and sulfadoxine/pyrimethamine had failed

The probability of Coartem being out of stock was higher in health centers than in hospitals due to weaknesses in the distribution system. Whereas hospitals received Coartem supplies directly from NMS, health centers got theirs through the district health stores; and there were supply chain management constraints within some districts.

The proportion of positive blood slides for malaria parasites was only 39 percent of the total examined. This relatively low slide positivity rate could be due to

- Not all fever cases were malaria cases
- Malaria parasites were not detected in some cases because of insufficient competence of the microscopist
- Some patients treat themselves with antimalarials and visit the health facilities after failing to improve on self-treatment.

Slide positivity rate was higher in young children than in older children and adults. It is known that the immunity which predominates in children works mainly by neutralising the toxins released when infected red blood cells burst whereas immunity in adults kills the malaria parasites in addition to neutralising the toxins.

The first consignment of Coartem arrived in Uganda on January 31, 2006, but distribution to health facilities started in March/April. Quantities of Coartem were estimated and distributed to health facilities using a formula based on population and consumption data push system. After this initial push, health facilities were expected to estimate the quantities of Coartem they needed and order accordingly from National Medical Stores (NMS) and Joint Medical Stores (JMS) pull system. A ceiling (quantity of Coartem per order) was set by the Ministry of Health (Pharmacy Section) which each level of health facility was not allowed to exceed. However, this pull system was not satisfactory; and by August 2006 Coartem was out of stock in many health facilities while it was available in large quantities at the National Medical Stores. This necessitated another push by MSH/RPM Plus in August/September 2006 to decongest the NMS after which the pull system was applied again.

The proportions of quantities of Coartem received by health facilities corresponded to the quantities ordered from the manufacturer (Novartis Pharmaceuticals) which were based on the general population census proportions rather than on the proportions of malaria attendances. This could explain why some Coartem dosage types were out of stock before others.

RECOMMENDATIONS

1. To quantify their needs of Coartem, health facilities should be advised to analyse their records and determine the proportions of malaria attendances corresponding to Coartem dosage age groups; otherwise, the following proportions could be used.

   - 4 months to 3 years—28 percent
   - 3 years to 7 years—13 percent
   - 7 years to 12 years—13 percent
   - 12 years and above—46 percent

2. Since the total malaria attendances vary from season to season health facilities should analyse their records corresponding to the time of the year. This will enable them to predict the total malaria attendances at any time of the year and then estimate the total quantity of Coartem they are likely to use.

3. In order to increase the proportion of Coartem prescriptions

   a. Health facilities should endeavour to avoid Coartem stock-outs

   b. Health workers who were not trained on the new malaria treatment policy should be trained

   c. Guidelines and work aids should be made more widely available

   d. All prescribers should be encouraged to prescribe Coartem as first line treatment for uncomplicated malaria through circulars, workshops and mass media

4. Since a significant proportion of blood slides which were examined for malaria parasites were negative, clinicians should be encouraged to investigate their patients for causes of fever other than malaria. Parasitological diagnosis of malaria should be done whenever practicable.

5. The District Health Office should ensure that Coartem and IEC materials are distributed to health facilities in sufficient quantities on time.

ANNEX 1. LIST OF HEALTH FACILITIES SURVEYED AND THEIR IN-CHARGES

District	H/Facility	Level	Name of In-Charge	Phone of In-Charge
Apac	Apac	GH	Sabiiti F. A	0772 884 222
Apac	Aduku	HC IV	Semugenyi A	0772 480 313
Apac	Ibuje	HC III	Akome D	0772 902 454
Apac	Chegere	HC II	Ogwang G. F	0782 296 350
Arua	Arua	RRH	Andema A	0772 615 187
Arua	Oli	HC IV	Eraku E	0772 881 550
Arua	Ediofe	HC III	Paula	0772 362 208
Arua	Orivu	HC II	Ayikoru F	0782 324 796
Gulu	Gulu	RRH	Otim T	0772 439 057
Gulu	Lalogi	HC4	Ojok C	0772 567 689
Gulu	Bobi	HC3	Omon P	-
Gulu	Laro	HC2	Nono J	0774 351 085
Hoima	Hoima	RRH	Moro B. E	0465 406 12
Hoima	Kikumbe	HC IV	Kawesa E	-
Hoima	Buhanika	HC III	Mbabazi E	0772 360 895
Hoima	Kyakapeya	HC II	Mbabazi D	-
Iganga	Iganga	GH	Lubega M	0772 460 130
Iganga	Bugono	HC IV	Bayega M	-
Iganga	Namungarwe	HC III	Baitanswa H	0772 647 257
Iganga	Iganga Prisons	HC II	Kiyemba J	0712 924 718
Kabale	Kabale	RRH	Tumwesigire S	0772 519 441
Kabale	Maziba	HC4	Kabwiga P	-
Kabale	Kyanamira	HC3	Tumukunde H	0772 653 212
Kabale	Nyabushabi	HC2	Byamukama E	0772 529 067
Kabarole	Virika	GH	Munube D	0772 505 643
Kabarole	Kibiito	HC4	Kakyo B. E	0772 908 830
Kabarole	Kisomoro	HC3	Nyakatura B	0782 078 387
Kabarole	Mucwa	HC2	Rukindo K. B	0772 464 989
Kampala	Mulago	NRH	Kyohere C	0712 867 211
Kampala	Kawempe	HC IV	Nsubuga C	-
Kampala	Kirudu	HC III	Kabahambya M	0772 936 597
Kampala	KCC Sen Staff	HC II	Mbowa R	0772 466 807
Kapchorwa	Kapchorwa	GH	Bukoma P	0782 714 675
Kapchorwa	Kapropron	HC IV	Musobo P. C	0772 953 175
Kapchorwa	Sipi	HC III	Sorowen H	0752 807 183
Kapchorwa	Gamugo	HC II	Wamaluku T	0752 436 812
Kasese	Kilembe	GH	Mugume F	0772 643 837
Kasese	Rukoki	HC IV	Buthalla B. P	0772 954 928
Kasese	Kasese T. C	HC III	Kamala C	0772 369 737

District	H/Facility	Level	Name of In-Charge	Phone of In-Charge
Kasese	Kilembe	HC II	Biira P. M	0772 358 119
Luwero	Luwero	HC4	Ssesimba B	0772 580 867
Luwero	Katikamu	HC3	Kamugisha C	0772 844 073
Luwero	Bukalasa	HC3	Mugisha M	0772 486 563
Luwero	Kigombe	HC2	Kyeswa M	-
Masaka	Masaka	RRH	Luke	0772 516 021
Masaka	Kiumba	HC IV	Nagirinya B	0772 585 532
Masaka	Mpugwe	HC III	Muwanga A	0772 565 799
Masaka	Kitabazi	HC II	Nantongo J	0772 433 354
Mbale	Mbale	RRH	Ojoome	-
Mbale	Busiu	HC IV	Wonyaye J. B	0772 355 098
Mbale	Bushikori	HC III	Musana H	0772 534 512
Mbale	St. Austin	HC II	Nabisawa R	-
Mbarara	Mbarara	RRH	Mihayo	-
Mbarara	Bwizibwera	HC4	Beineomugisha B	0752 547 777
Mbarara	Bukiro	HC3	Kinyanta J	0782 773 683
Mbarara	Nyamityobora	HC2	Batesi M	0782 573 055
Mororo	Moroto	GH	-	-
Mororo	Nadunget	HC III	Lotee P. M	0782 398 939
Mororo	Kidepo	HC III	Shayo T	0782 385 437
Mororo	DMO Clinic	HC II	Ongiertho P. G	0772 952 946
Mubende	Mubende	GH	Ngobie A	0772 410 746
Mubende	Kiganda	HC4	-	-
Mubende	Kitenga	HC3	Kubuzigu J	0772 665 018
Mubende	Kaweeri	HC2	Mulindwa I	0772 584 382
Mukono	Kawolo	GH	Ziiwa J	0772 426 457
Mukono	Mukono T. C	HC IV	Kaddu M. M	0752 649 701
Mukono	Busabaga	HC III	Jjumba W	0782 478 452
Mukono	Mpoma	HC II	Kiyimba R	0712 955 657
Pader	Kalongo	GH	Abonyo E	
Pader	Pajule	HC4	Ongay M.	
Pader	Pader	HC3	Milly G.	
Pader	Pakor	HC2	Elupe P.	0772 972 534
Soroti	Soroti	RRH	Odu	
Soroti	Princess Diana	HC IV	Kivumbi J	0712 241 519
Soroti	Eastern Div	HC III	Ojur J. B	0772 867 176
Soroti	Moruapesur	HC II	Abuku B	0782 606 296
Tororo	Tororo	GH	Wandera R. P	0752 810 060
Tororo	Mukuju	HC4	Kakala	-
Tororo	Osukuru	HC3	Omollo S	0772 321 982
Tororo	Bisons	HC2	Bwayo I	0774 282 217

ANNEX 2. DATA COLLECTION TOOL

Instructions

1. Use health facilities with comprehensive out-patient registers from January 2005 to December 2006. Four health facilities should be selected per district.

2. For districts with hospitals the health facilities should include:
    i. One hospital
    ii. One HC 4
    iii. One HC 3
    iv. One HC 2

3. For districts without hospitals the health facilities should include:
    i. One HC 4
    ii. Two HC 3
    iii. One HC 2

4. Count and record the new malaria attendances according to the following age groups:
    i. 4 months up to but not including 3 years
    ii. 3 years up to but not including 7 years
    iii. 7 years up to but not including 12 years
    iv. 12 years and above

5. Record the figures on forms 1 and 2 for the years 2005 and 2006 respectively. Record also the total new malaria attendances and the total new attendances for all diseases.
6. ount and record the Coartem prescriptions according to the above age groups for the year 2006. Record also the total malaria prescriptions for 2006.

7. For this analysis even those diagnoses of malaria which were not confirmed by microscopy (or by RDT) should be included.

8. For health facilities with laboratory facilities, record the results of blood smears for malaria parasites.

ANNEX 3. FORMS

1.0	**HEALTH FACILITY PROFILE**	
	Name and level of health facility:	
	Defined area served by h/facility:	
	Population of defined area:	
	Sub-county where h/facility is found:	
	Health sub-district:	
	District:	
	Name and designation of in-charge:	
	Phone and e-mail of in-charge:	

2..0	**AVAILABILITY OF MEDICINES: Are the following antimalarial medicines available in the health facility?**			
	Medicine	**Received**	**Used**	**Balance**
	COARTEM® YELLOW (1x6 blister pack)			
	COARTEM® BLUE (1x12 blister pack)			
	COARTEM® BROWN (1x18 blister pack)			
	COARTEM® GREEN (1x24 blister pack)			
	Artesunate + Amodiaquine tablets			
	Other ACTs (specify)			

3.0	**TRAINING OF HEALTH WORKERS ON THE NEW MALARIA TREATMENT POLICY**			
	Total number of health workers trained		Date when training was completed	

	Details of number of health workers trained in malaria case management using ACTs										
	Cadre	Clinical		Nursing		Paramedical		Other		Total	
	Gender	M	F	M	F	M	F	M	F	M	F
	All h/workers										
	Those trained										

	Did the attendances increase/decrease when COARTEM became available?
4.0	**SUCCESSES and CONSTRAINTS**
4.1	**Successes**
	List the malaria treatment policy implementation activities you think were successful
4.2	**Constraints/Problems**
	List the problems/ constraints you encountered during the malaria treatment policy implementation

4.3	**Experiences with using COARTEM**
	State your positive or negative experiences (or reports) concerning the treatment of malaria using COARTEM®
4.0	**PERSONS MET**

	Name	Designation	Phone	e-mail

Notes:

Stock out Data collection Form

Type of facility :	Location :	Date :

Existing inventory control system:	Electronic	☐	**Data collected from:**	Electronic	☐
	Manual register	☐		Manual register	☐
	Stock cards	☐		Stock cards	☐
	Fiches de comptage	☐		Fiches de comptage	☐
	Other (specify)	☐		Other (specify)	☐

Medicine/Product	Date stock was depleted (zero stock) between Jan. 06 and Dec. 06	Date stock was replenished	Number of days out of stock