



Household Survey Report (Baseline)

Republic of Uganda

03/09 – 04/09



Country Program Coordinator

Mr. Peter Buyungo
Director, Research Department, PACE
Program for Accessible Health, Communication & Education
Uganda Plot 2 Ibis Vale, Kololo
P.O. Box 27659, Kampala
Phone: + 256-312-351100 / +256-414-230080
Email: pbuyungo@pace.org.ug

Principal Investigator

Dr. Kathryn O'Connell
ACTwatch, Malaria Control & Child Survival Department
Population Services International
Regional Innovations Office
Whitefield Place, School Lane, Westlands
P.O. Box 14355-00800 Nairobi, Kenya
Phone: + 254 20 4440125/8
Email: kate@ACTwatch.info



Acknowledgements

ACTwatch is funded by the Bill and Melinda Gates Foundation. This study was implemented by Population Services International (PSI), coordinated by Peter Buyungo, *ACTwatch* Country Program Coordinator for PSI/Uganda and Director, Research Department, Program for Accessible Health, Communication and Education (PACE), in collaboration with Ntale Peter Simon, Uganda Bureau of Statistics; Enid Wamani, Malaria and Child Illness Secretariat; Anthony Eseu and Okwalinga Henry Tito, PILGRIM; Dr. A. Nakamya, Head, National Drug Authority Laboratory, Uganda. Survey implementation was conducted by Dr. Gideon Rutaremwa, Makerere University Consultant and PACE: Simon Sensalire, Susan Kambabazi Lubaale, Arnold Hannington Mbigiti, Susan Mpanga Mukasa and George Katende.

Project support was provided by PSI from the following individuals: Dr. Kathryn O'Connell, Principal Investigator, *ACTwatch*; Dr. Steven Chapman, Chief Technical Officer; Dr. Desmond Chavasse, Project Director, *ACTwatch*, Vice President, Malaria Control and Child Survival; Illah Evance, Erik Munroe and Tsione Solomon, *ACTwatch* Research Associates; Dr. Abdinasir Amin, Malaria Principal Investigator; Dr. Megan Littrell, Malaria Deputy Principal Investigator; Dr. Kim Longfield, Director, Research and Metrics.

A technical review of the household survey study design was provided by the following *ACTwatch* partners, *ACTwatch* Advisory Committee members and other stakeholders including: Dr. Frederick Kato, Dr. Myers Lugemwa, Dr. George Mukone and Dr. Dennis Rubahika, National Malaria Control Program (NMCP), Ministry of Health; Dr. Kaggwa Mugagga, World Health Organization; David Ekau, National Drug Authority; Higenyi Emmanuel, Joint Medical Stores; Anne R. Katahoire, Child Health and Development Centre, Makerere University.

Dr. Kara Hanson	Reader, Health System Economics, Health Policy Unit, London School of Hygiene and Tropical Medicine (LSHTM)
Dr. Catherine Goodman	Senior Lecturer, Health Economics & Policy, Health Policy Unit, LSHTM
Mr. Suprotik Basu	Advisor to the UN Secretary General's Special Envoy for Malaria
Mr. Rik Bosman	Supply Chain Expert, Former Senior Vice President, Unilever
Ms. Renia Coghlan	Global Access Associate Director, Medicines for Malaria Venture
Dr. Thom Eisele	Assistant Professor, Tulane University
Mr. Louis Da Gama	Malaria Advocacy & Communications Director, Global Health Advocates
Dr. Paul Lalvani	Executive Director, RaPID Pharmacovigilance Program
Dr. Ramanan Laxminarayan	Senior Fellow, Resources for the Future
Dr. Matthew Lynch	Project Director, VOICES, Johns Hopkins University Centre for Communication Programs
Dr. Bernard Nahlen	Deputy Coordinator, President's Malaria Initiative (PMI)
Dr. Jayesh M. Pandit	Head, Pharmacovigilance Department, Pharmacy and Poisons Board-Kenya
Dr. Melanie Renshaw	Former Senior Health Advisor for Malaria, UNICEF
Mr. Oliver Sabot	Director, Malaria Control Team, Clinton Foundation
Ms. Rima Shretta	Senior Program Associate, Strengthening Pharmaceutical Systems Program, Management Sciences for Health
Dr. Rick Steketee	Science Director, Malaria Control and Evaluation Partnership in Africa (MACEPA)
Dr. Warren Stevens	Health Economist
Dr. Gladys Tetteh	CDC Resident Advisor, President's Malaria Initiative (PMI)-Kenya
Prof. Nick White, OBE	Professor of Tropical Medicine, Mahidol and Oxford Universities
Prof. Prashant Yadav	Professor of Supply Chain Management, MIT-Zaragoza International Logistics Program
Dr. Shunmay Yeung	Paediatrician & Senior Lecturer, LSHTM

Suggested Citation

ACTwatch Group and the Program for Accessible Health, Communication & Education (PACE)/ Uganda. (2009). Uganda Household Survey Report, 2009. Population Services International: DC. Available from: <http://www.actwatch.info>

Table of Contents

LIST OF FIGURES	5
LIST OF TABLES	5
DEFINITIONS	6
EXECUTIVE SUMMARY	7
COUNTRY BACKGROUND	13
RESULTS	15
Core Indicators	15
Supplementary Indicators	19
Determinants of Prompt Treatment of Fever in Children Under Five	23
APPENDIX A: TREATMENT-SEEKING, DIAGNOSIS & TREATMENT OF FEVER AMONG PEOPLE AGE FIVE & ABOVE	25
APPENDIX B: PRICE & VOLUMES DATA FOR ANTIMALARIALS ACQUIRED FOR CHILDREN UNDER FIVE IN RURAL & URBAN AREAS	28
APPENDIX C: DEMOGRAPHIC CHARACTERISTICS	30
APPENDIX D: BEHAVIORAL DETERMINANTS, SCALE ITEMS & SCALE PROPERTIES	31

List of Figures

Figure 1. AMs Acquired for Children under Five with Fever	8
Figure 2. Percentage of Children under Five with Fever that Received AM Treatment, First-Line Treatment, and Diagnosis	8
Figure 3. Percentage of Children under Five with Fever that Received an AM, by Type.....	9
Figure 4. Source of AM Treatment, among Treated Children.....	9
Figure 5. Source of ACT Treatment, among Children that Received an ACT	9
Figure 6. Price in USD of AM Treatments Acquired for Children under Five, by Most Common Treatment Type and Most Common Outlet Type	10
Figure 7. First Source of Treatment for Children with Fever	10
Figure 8. Reason for First Treatment Source among Caregivers who Sought Treatment	10
Figure 9. Caregiver Knowledge, Practices and Beliefs	11

List of Tables

Table 1. Prompt treatment of fever among children under five	15
Table 2. Type and timing of AM drugs among children under five.....	16
Table 3. Source of AMs, among children under five who received an AM treatment	17
Table 4. Cost of AM treatment for children under five	18
Table 5. Treatment-seeking behaviour	19
Table 6. Demand for specific antimalarial drugs	20
Table 7. Relative volumes of AM acquired	20
Table 8. Caregiver knowledge and practices	21
Table 9. Caregiver beliefs on the most effective AM treatment	21
Table 10. Determinants of prompt treatment of fever in children under five	24
Table A 1. Treatment-seeking, diagnosis and treatment for fever among people age five and above	25
Table A 2. Relative volumes of AMs acquired for children age 5 to 14	26
Table A 3. Relative volumes of AMs acquired for people age 15 and above.....	27
Table B 1. Cost of AM treatment for children under five	28
Table B 2. Relative volumes of AMs acquired in high versus low/moderate endemic areas	29
Table C 1. Demographic characteristics	30

Definitions

Antimalarial combination therapy – The simultaneous use of two or more drugs of different classes to treat malaria.

Artemisinin and its derivatives – Artemisinin is a plant extract used in the treatment of malaria. The most common derivatives of artemisinin used to treat malaria are artemether, artesunate, and dihydroartemisinin.

Artemisinin-based Combination Therapy (ACT) – A combination of artemisinin or one of its derivatives with a partner drug. The partner drug is an antimalarial(s) of a different class.

First-line treatment – The government recommended treatment for uncomplicated malaria. Uganda’s first-line treatment is artemether-lumefantrine, 20mg/120mg.

Monotherapy – Antimalarial treatment with a single medicine: either a single active compound or a synergistic combination of two compounds with related mechanisms of action, such as sulfadoxine-pyrimethamine.

Nationally registered ACTs – ACTs registered with a country’s national drug regulatory authority and permitted for sale or distribution in-country. Each country determines its own criteria for placing a drug on its nationally registered listing.

WHO approved ACTs – ACTs that appear on the WHO list of antimalarials approved for procurement.

Legend for tables –

Symbol	
--	No data available
SP	Sulfadoxine-Pyrimethamine
CQ	Chloroquine
AL	Artemether-Lumefantrine
AM	Antimalarials
CHW	Community Health Worker
\$	US Dollars
AOR	Adjusted odds ratio
OR	Odds ratio
CI	Confidence interval
(R)	Negatively phrased statement that are reversed coded

Executive Summary

Background:

The household survey is one of the *ACTwatch* research components. The objective of the household survey component is to monitor consumer treatment-seeking behaviour including choice of antimalarial and price paid for treatment. Data from the household survey are also used to identify determinants of appropriate treatment behaviour.

This report presents indicators on knowledge, beliefs, experiences and behaviour with respect to seeking treatment for fever in children under five years of age. A set of core indicators related to prompt and effective treatment and cost of antimalarials for treatment of children is presented first. A second expanded section contains indicators on treatment-seeking behaviour; caregiver knowledge, practices and beliefs; and information on acquired antimalarials including source and relative volumes. Indicators are presented at the child, caregiver and treatment (antimalarial drug) levels. Core indicators are presented across household wealth quintiles, high/low endemicity, caregiver knowledge and child age.

Household inclusion criteria for this study included presence of a household member under five years of age that experienced fever in the past 2 weeks. However, data were collected on treatment-seeking behaviour and experiences for all fevers that occurred among household members of all ages in the past 2 weeks. As such, data are presented for children under five in the main body of the report, and for people age five and above in Appendix A. Results for people age five and above should be interpreted with caution given the sampling design.

Methods:

This study uses data from a cross-sectional household survey of children's caregivers. A nationally-representative sample of households in Uganda was drawn using low/high endemic equal allocation stratification and three-stage cluster sampling, probability proportional to size (PPS). Within each strata, 19 sub-districts were selected PPS. A total of 38 sub-districts were selected from a list of 958 sub-districts. At second stage, 114 enumeration areas (EA) were sampled PPS and a random sample of households within each EA was drawn. All households included in the study had at least one child under the age of five with fever in the past two weeks. Among eligible households, children's caregivers completed two questionnaire modules: 1) Treatment Seeking and Case Management regarding fever episodes among children under 5; and 2) Caregiver Knowledge, Beliefs and Attitudes. In eligible households containing a member aged five and above that had fever within the past two weeks, the Treatment Seeking and Case Management module was completed by the relevant household member or his/her caregiver on this episode of fever. Household heads provided information on the household including asset ownership and dwelling characteristics.

Several validation and data checking steps occurred during and after data collection. Double data entry was conducted using Microsoft Access (Microsoft Cooperation, Seattle, WA, USA). Stata 10.1 (Stata Corp, College Station, TX) was used for all analyses. To obtain the national estimates provided in this report, data were weighted to account for equal allocation stratified sampling from low and high domains. Standard error estimation in logistic regression analysis accounted for clustering at the commune and EA levels.

For more information on the study design log on to www.ACTwatch.info.

Results:

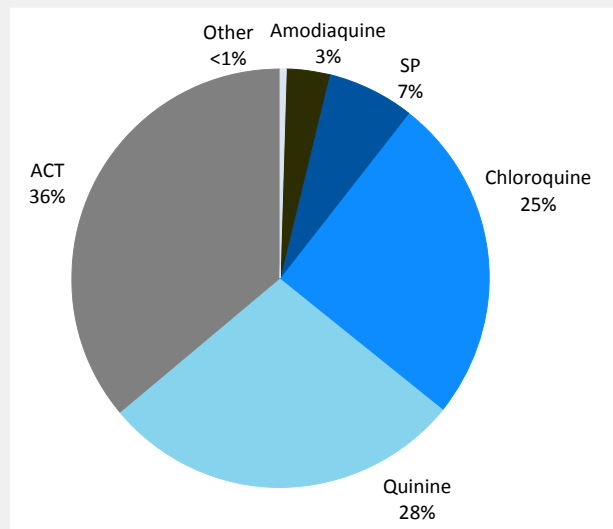
Data were collected during the rainy season, from 16th March to 2nd April 2009. A total of 2,170 households were screened and 1,509 households met inclusion criteria and agreed to participate in the study. Among these households, 1,453 caregivers were interviewed regarding 1,752 children with fever in the two weeks preceding the survey. Additionally, caregivers and other household members were interviewed on episodes of fever among 572 people age five and above.

ANTIMALARIALS ACQUIRED FOR CHILDREN UNDER FIVE WITH FEVER: Antimalarials in the household survey are categorized as follows: sulfadoxine-pyrimethamine (SP), amodiaquine, chloroquine, quinine, ACT, national first-line [AL], and other antimalarial. ACTs are the most commonly accessed drug for treatment of fever in children under five (36% of n=1,015). 28% of the antimalarials were quinine treatments, 25% were chloroquine, 7% were SP and 3% were amodiaquine.

Caregivers in this study accessed “other antimalarials,” including artemisinin monotherapies; <1% of antimalarials acquired for children with fever (n=6 antimalarials) were categorized as “Other” (see Figure 1). All antimalarials categorized as “Other” were artemisinin monotherapies.

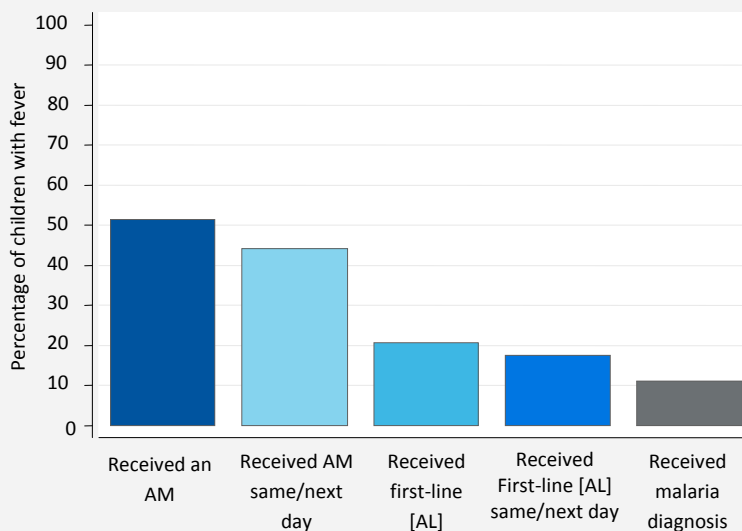
The most commonly accessed ACT was AL sold under the brand name Coartem®; 92% of the n=360 ACTs acquired for children under five were Coartem®. Most ACTs acquired for children under five were on the list of WHO-approved ACTs and/or were on Uganda’s list of nationally-registered antimalarial treatments (99%)

Figure 1. AMs Acquired for Children under Five with Fever



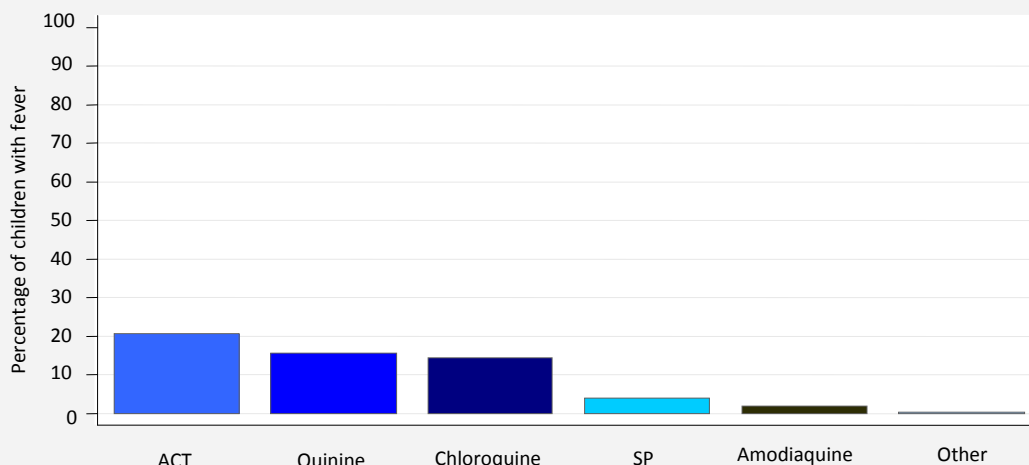
TREATMENT AND DIAGNOSIS OF CHILDREN UNDER FIVE WITH FEVER: 51% of the n=1,752 children under five with fever were treated with an antimalarial. When administered, treatment was typically prompt; 44% of children with fever were treated with an antimalarial the same or next day after onset of fever. Treatment with the first-line antimalarial [AL] was significant in Uganda; 21% of children with fever were treated with the first-line antimalarial [AL], and 18% were treated with the national first-line antimalarial the same or next day. Diagnostic testing for malaria in children under five with fever is uncommon; 11% of children under five with fever received a malaria diagnosis.

Figure 2. Percentage of Children under Five with Fever that Received AM Treatment, First-Line Treatment, and Diagnosis



ANTIMALARIAL TREATMENT FOR CHILDREN UNDER FIVE WITH FEVER, BY ANTIMALARIAL TYPE: One in five of the n=1,752 children with fever were treated with ACTs. 16% of children with fever were treated with quinine; 14% with chloroquine; 4% with SP and only 2% were treated with amodiaquine.

Figure 3. Percentage of Children under Five with Fever that Received an AM, by Type



SOURCE OF ANTIMALARIAL AND ACT TREATMENT: Sources of ACT acquired for children (n=313 children treated with ACT) differ somewhat from sources of all antimalarials acquired for children (n=808 children treated with an antimalarial). Public health facilities were the most common source of ACTs (40%), however private health facilities were the most common source of all antimalarial treatment (42%). Fewer than 10% of children received antimalarial treatment from pharmacies, grocery stores and CHWs. “At home” was a substantial source for fever treatment and could encompass storage of partial or full treatment doses. 21% of children received an antimalarial stored at home and 24% received treatment with an ACT stored at home.

Figure 4. Source of AM Treatment, among Treated Children

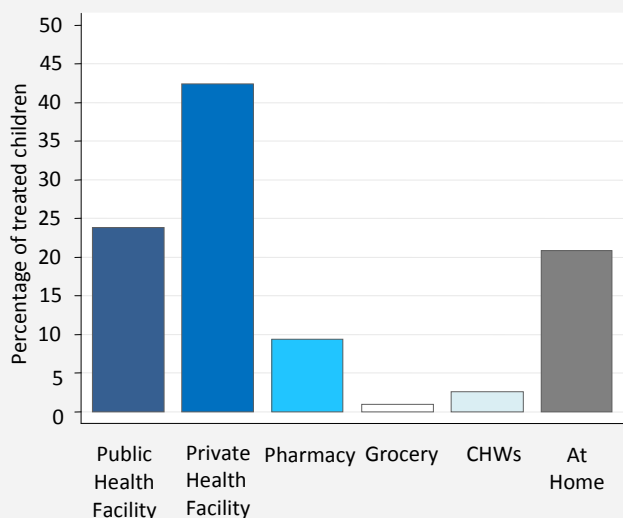
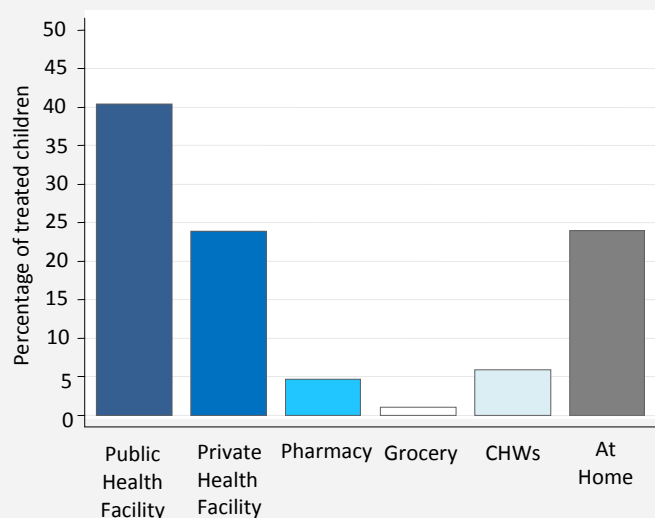
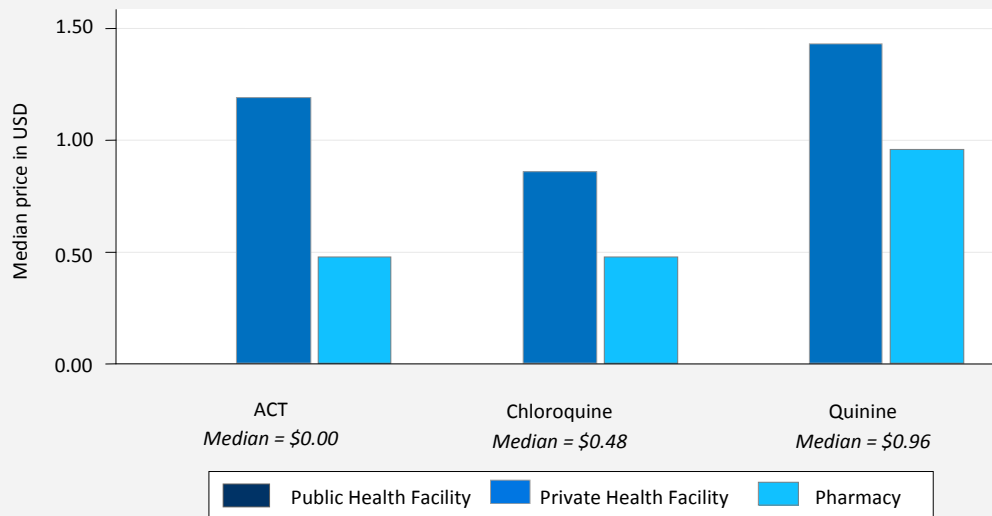


Figure 5. Source of ACT Treatment, among Children that Received an ACT



COST OF ANTIMALARIAL TREATMENT FOR CHILDREN UNDER FIVE: 43% of antimalarial medicines acquired for children under five were provided free of charge. The median price of antimalarials acquired in public health facilities was \$0.00 (n=131 ACT, n=31 chloroquine, n=30 quinine). Antimalarials were more expensive in private health facilities as compared with pharmacies. For example, the median price of ACTs acquired from private health facilities was \$1.19 (n=55) as compared with \$0.48 from pharmacies (n=13).

Figure 6. Price in USD of AM Treatments Acquired for Children under Five, by Most Common Treatment Type and Most Common Outlet Type



TREATMENT-SEEKING BEHAVIOUR FOR FEVER IN CHILDREN UNDER FIVE: Caregivers of 96% of children with fever sought treatment for the child's fever. Most commonly, caregivers treated children at home (37%). Other common sources of treatment include private health facilities (29%), public health facilities (15%), and pharmacies or drug shops (10%). Caregivers were asked about reasons for choosing this initial source of treatment. Among children whose caregivers sought treatment (n=1,613), most caregivers selected the initial treatment source because it was close to home (49%). Other common reasons for initial treatment source include: no need for intensive care (13%); reputation for quality treatment (8%); availability of inexpensive or free treatment (8%), availability of modern medicine (7%) and availability of medicines at home (6%).

Figure 7. First Source of Treatment for Children with Fever

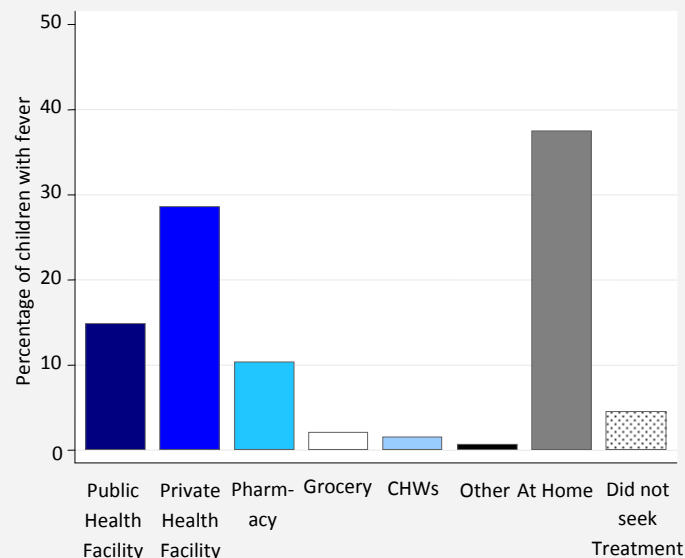
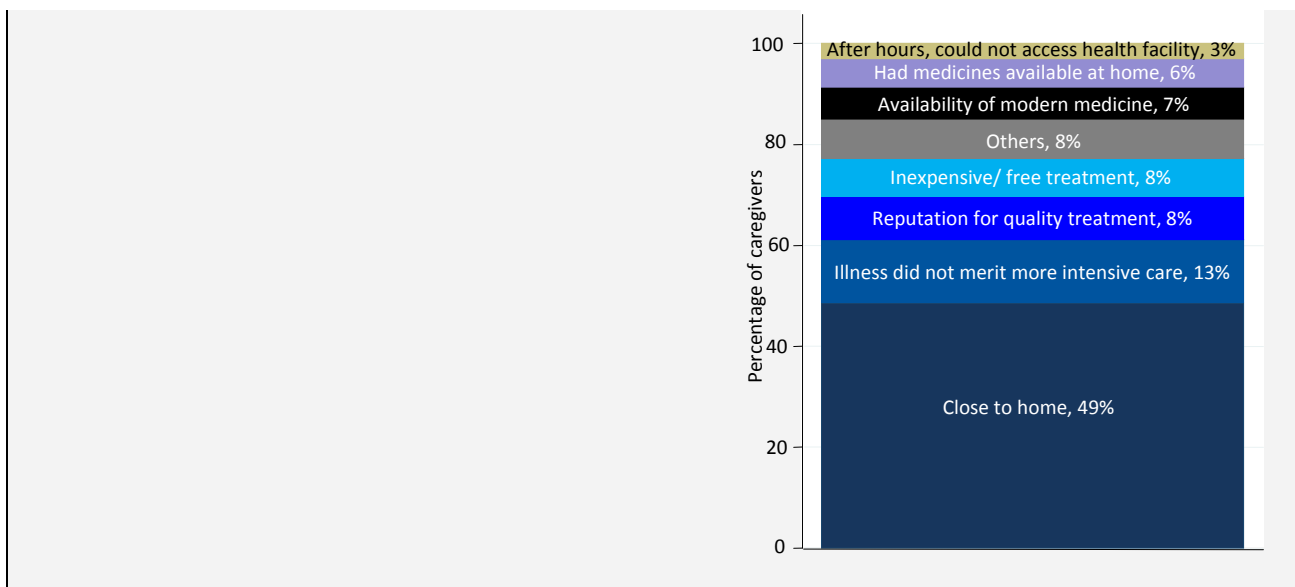
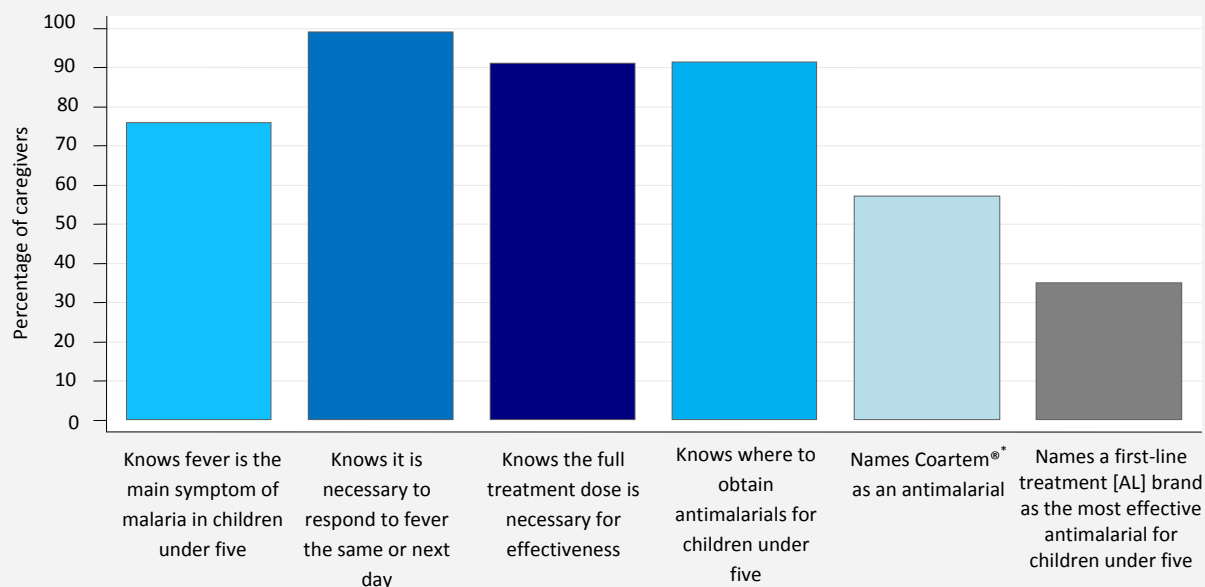


Figure 8. Reason for First Treatment Source among Caregivers who Sought Treatment



CAREGIVER KNOWLEDGE, PRACTICES AND BELIEFS: General knowledge of malaria and treatment of fever was high among caregivers of children under five. A high percentage of caregivers know that fever is the main symptom of malaria in children under five (76%); that fever in children requires prompt response (99%); and that the full treatment dose is required for drug efficacy (91%). Most caregivers reported knowing where to obtain antimalarials for children under five (91%). While 57% of caregivers have heard of the most common brand of first-line treatment, Coartem®, only 35% cited a first-line treatment brand as most effective for treating children under five.

Figure 9. Caregiver Knowledge, Practices and Beliefs



*Coartem® is the most common brand of first-line [AL] treatment in Uganda

DETERMINANTS OF TREATMENT OF FEVER IN CHILDREN UNDER FIVE:

Treatment of fever with an antimalarial the same or next day after onset of fever: A full model examining prompt treatment of fever included the following determinants: household residence and wealth, caregiver education and age, child age, and psychometric scales measuring opportunity, ability and motivation to treat fever with an antimalarial. Determinants with significant adjusted associations with prompt antimalarial treatment include: outcome expectations for antimalarial treatment (AOR=1.60, 95% CI=1.20-2.13) and threat of malaria to the community (AOR=1.35, 95% CI=1.02-1.79). Household wealth had no significant adjusted association with prompt treatment of fever with an antimalarial.

Country Background

Uganda is a landlocked country in East Africa and shares borders with the Democratic Republic of Congo, Kenya, Rwanda, Sudan and Tanzania. Its population is estimated at 31.4 million with approximately 13% living in urban areas.¹ 35% percent of the population lives below the poverty line and the per capita gross domestic product is \$1,300.² One in eight children dies before reaching their fifth birthday³ with malaria being responsible for nearly half of all deaths in children under five.

Epidemiology and Malaria Control Strategies

In 95% of the country the malaria epidemiology can be characterised as stable with year-round high transmission rates. The remaining 5% of the country consists of seasonal epidemic-prone malaria transmission areas in the highlands and along the eastern and northeastern regions bordering Kenya and Sudan, respectively. *P. falciparum* is the predominant parasite species. Children-under-five and pregnant women are considered to be the most vulnerable.

In the National Malaria Control Strategy 2006-2010, these vulnerable groups are the focus of interventions. The main programmatic areas include: ITN distribution through campaigns and antenatal clinics; indoor residual spraying with focus on low risk and epidemic-prone areas; increased access to ACT and improved diagnosis; and intermittent preventive treatment for pregnant women with sulfadoxine-pyrimethamine. For ACTs, the aim is to increase access through various channels including: public and NGO health facilities; community distribution system for medicines (home-based management of fever); and the private sector.

National Treatment Policy

In 2004, the National Malaria Control Program (NMCP) adopted artemether-lumefantrine (AL) 20mg/120mg as the first-line treatment for uncomplicated malaria through health facilities whilst artesunate-amodiaquine (ASAQ) 50mg/153mg was selected as an alternative first-line. The policy of employing AL as first-line treatment was expanded from the health facility to the community-level channel in 2008. Quinine is recommended for treatment of severe malaria and is available at health centre level IV (health sub-district level) and hospitals. According to national policy, consultation and treatment of uncomplicated malaria in all age groups is to be provided in public health facilities (all levels) and community outreach free of charge. Oral artemisinin monotherapies have been banned in Uganda since 2007.⁴

The policy on diagnosis is for cases to be confirmed through microscopy except in children under the age of five years, who are treated based on clinical signs. Microscopic testing is to be provided free of charge in the public health system and to be available at health centre level III (sub-county level) and higher levels. In practice, many health centre level III facilities do not have the necessary facilities and hence, diagnosis of malaria remains largely clinical at this level. The inclusion of rapid diagnostic tests (RDTs) as part of the treatment policy is being considered with pilot activities taking place at the health centre III level.

Antimalarial Treatment Distribution and Delivery

In 2006, Uganda began the rollout of AL as the first-line with the branded drug Coartem (AL) in the public sector health facilities. This was followed in 2008 with the introduction of AL at the community level through the Home-based Management of Fever for Children program run through the Community Medicine Distributors.

Despite the availability of free treatment for uncomplicated malaria in the public sector, as in many other developing countries, a large proportion of febrile children in Uganda receive their first treatment from formal and informal private sector practitioners including pharmacists, doctors, nurses and midwives, as well as unqualified practitioners

¹ US Census Bureau, International Database 2009.

² CIA (2009). The CIA World Factbook: Uganda. <https://www.cia.gov/library/publications/the-world-factbook/geos/ug.html>.

³ UNICEF (2009). State of the World's Children 2009.

⁴ WHO (2008). World Malaria Report 2008. WHO/HTM/GMP/2008.1. page 120-122.

such as drug vendors, village doctors and traditional healers.^{5,6,7,8,9} Due to the prohibitively high costs of private sector ACTs¹⁰, a project piloting a subsidy to increase ACT access through the private sector was launched in September 2008 in the districts of Budaka, Pallisa, Kaliro and Kamuli. The project, the Consortium for ACT Private Sector Subsidy, uses AL (Coartem) labeled with a green leaf with the consumer price ranging from 200 USH to 800 USH (\$0.10 to \$0.40 USD) depending on the dosage. In the first year, approximately 700,000 doses of AL have been made available through this project.

Malaria financing

External funding is an important source of funding for malaria control in Uganda. Since 2000, many bi-lateral donors have channeled their aid through a sector wide approach (SWAp) that includes budget support. Other donors such as the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM) and the President's Malaria Initiative (PMI) provide malaria-specific funding.

With a budget of \$66 million, GFATM Round 4 represents the most important source of financing for public sector ACTs. Some stock-outs of ACTs experienced in 2008 were due, in part, to delays in grant negotiations. The GFATM funds are also used to introduce ACTs via a pilot at the community level employing the Home Based Management of Fever policy. Since 2006, Uganda has received \$74.7 million from PMI: \$9.5 million (2006), \$21.5 million (2007), \$21.8 million (2008) and \$21.9 million (2009). Of the grant for 2008, \$2.5 million was allocated for case management including the procurement of ACTs for the Home Based Management of Fever for Children policy and procurement of drugs for severe malaria and pre-referral.

⁵ Konde-Lule J, et al. (2006). "The Potential of the Private sector to improve health outcomes in Uganda. Kampala: Makerere University Institute of Public Health".

⁶ Goodman C, Kachur SP, et al. (2004). "Retail supply of malaria-related drugs in rural Tanzania: risks and opportunities". *Trop Med Int Health* 9(6): 655-63.

⁷ Berman P. (1996) The role of private providers in maternal and child health and family planning services in developing countries. *Health Policy and Planning* 11, 142-155.

⁸ McCombie SC. (1996). "Treatment seeking for malaria: a review of recent research". *Social Science Medicine* 43(6), 933-945.

⁹ Tawfik Y, Nsungwa-Sabitii J, Greer G, Owor J, Kesande R, Prysor-Jones S. (2006). "Negotiating improved case management of childhood illness with formal and informal private practitioners in Uganda". *Trop Med Int Health*. 11(6):967-973.

¹⁰ Medicines for Malaria Venture (2007). "Understanding the anti-malarial market: price, availability and affordability of anti-malarial medicines in Uganda".

Results:

Core Indicators

Table 1. Prompt treatment of fever among children under five

Percentage of children under five with fever in the two weeks preceding the survey who took an antimalarial drug, took an antimalarial drug the same/next day, and received a diagnosis, by background characteristics.

	Percentage who took an AM drug	Percentage who took an AM drug the same/next day	Percentage who received a diagnosis	# of children with fever
Age (in years)	%	%	%	n
<1	41.34	33.50	9.36	368
1	52.28	44.17	13.76	373
2	54.17	49.12	9.86	334
3	56.36	47.88	11.70	300
4	55.43	48.03	9.63	347
Malaria endemicity				
Low/Moderate	50.45	42.45	13.05	888
High	52.02	45.25	9.96	864
Caregiver's education				
No education	49.01	39.42	6.21	370
Some primary	49.07	42.86	9.50	779
Primary plus	57.50	50.88	17.72	533
Wealth index				
Poorest	53.39	44.01	5.67	356
Second	47.08	38.49	9.58	357
Middle	46.24	39.93	10.01	343
Fourth	53.24	47.87	10.72	360
Richest	58.29	51.83	21.42	334
All children	51.47	44.17	11.12	1,752*

* n=1,722 for child age; n=1,682 for caregiver's education; n=1,750 for household wealth; n=1,666 for diagnosis

Table 2. Type and timing of AM drugs among children under five

Percentage of children under five with fever in the two weeks preceding the survey who took antimalarial treatment, and percentage who took antimalarial treatment on the same day or the next day after developing fever, by background characteristics.

	Percentage who took:							Percentage who took the drug on the same or the next day:							# of children with fever
	Amodia-quine	SP	CQ	Quinine	First-Line [AL]	ACT	Other AM	Amodia-quine	SP	CQ	Quinine	First-Line [AL]	ACT	Other AM	
Age (in years)	%	%	%	%	%	%	%	%	%	%	%	%	%	%	n
<1	1.69	3.53	13.01	11.41	15.77	15.77	0.34	1.29	2.38	10.77	9.68	12.44	12.44	0.34	368
1	3.33	3.50	13.00	18.63	20.48	20.48	0.20	3.33	2.22	12.00	15.33	16.27	16.27	0.20	373
2	1.57	3.20	14.40	14.62	24.28	24.28	0.66	1.19	3.20	13.58	11.42	22.05	22.05	0.66	334
3	0.25	6.48	17.06	18.25	20.14	20.14	0.00	0.00	5.32	14.99	13.73	17.23	17.23	0.00	300
4	2.46	3.37	15.42	16.58	23.32	23.32	0.21	2.25	3.00	12.54	12.84	20.43	20.43	0.21	347
Malaria endemicity															
Moderate/Low	1.58	5.07	15.20	15.09	19.26	19.26	0.56	1.13	3.94	12.61	12.16	16.10	16.10	0.56	888
High	2.08	3.24	13.89	16.09	21.64	21.64	0.12	1.97	2.66	12.62	12.73	18.52	18.52	0.12	864
Caregiver's education															
No education	1.83	4.86	15.48	10.50	20.86	20.86	0.00	1.63	3.52	12.70	7.47	16.60	16.60	0.00	370
Some primary	1.31	3.64	14.78	15.25	18.76	18.76	0.25	1.22	2.64	13.76	12.57	15.49	15.49	0.25	779
Primary plus	2.99	4.10	12.48	20.48	24.04	24.04	0.59	2.60	3.96	10.66	16.90	21.90	21.90	0.59	533
Wealth index															
Poorest	0.38	5.23	14.01	13.63	24.49	24.49	0.33	0.19	3.62	11.93	10.75	20.51	20.51	0.33	356
Second	1.39	3.50	14.94	13.81	16.68	16.68	0.61	1.04	3.10	12.48	11.06	12.88	12.88	0.61	357
Middle	2.88	2.04	14.61	15.20	15.82	15.82	0.00	2.45	1.24	13.15	10.92	13.99	13.99	0.00	343
Fourth	3.17	5.25	14.39	16.53	20.78	20.78	0.00	3.17	4.68	13.24	13.39	18.13	18.13	0.00	360
Richest	1.85	3.39	13.75	20.29	26.41	26.41	0.48	1.61	2.98	12.38	17.28	23.09	23.09	0.48	334
All children	1.89	3.92	14.38	15.71	20.75	20.75	0.28	1.65	3.14	12.61	12.52	17.61	17.61	0.28	1,752*

* n=1,722 for child age; n=1,682 for caregiver's education; n=1,750 for household wealth

Table 3. Source of AMs, among children under five who received an AM treatment[†]

Source an antimalarial and ACT treatment for children under five years with fever in the two weeks preceding the survey, among children who received an antimalarial treatment or ACT, by background characteristics.

	Source of AM treatment among treated children:							Source of ACT among children treated with ACT:						
	Public Health Facility	Private Health Facility	Pharmacy [‡]	Grocery	CHW	At home	# of children treated with AM	Public Health Facility	Private Health Facility	Pharmacy [‡]	Grocery	CHW	At home	# of children treated with ACT
Age (in years)	%	%	%	%	%	%	n	%	%	%	%	%	%	n
<1	27.44	44.10	9.53	0.93	2.79	15.20	135	48.95	23.95	5.46	0.00	5.04	16.60	48
1	25.56	46.85	6.78	0.42	1.13	19.26	176	41.87	26.88	4.06	1.09	1.88	24.22	65
2	23.63	44.14	9.98	0.75	2.25	19.26	167	42.81	28.45	4.45	0.00	5.17	19.11	73
3	19.23	42.90	10.71	2.11	3.28	21.76	153	36.97	20.19	4.53	4.53	9.06	24.72	55
4	22.61	35.50	10.24	0.76	3.79	27.10	169	31.88	20.66	5.39	0.00	8.99	33.08	69
Malaria endemicity														
Low/Moderate	26.50	46.25	8.25	0.50	0.25	18.25	400	56.34	19.01	3.52	0.70	0.00	20.42	142
High	22.30	40.20	10.05	1.23	3.92	22.30	408	32.75	26.32	5.26	1.17	8.77	25.73	171
Caregiver's education														
No education	27.13	37.78	10.91	0.77	6.16	17.26	167	42.52	16.31	5.49	1.83	12.81	21.04	68
Some primary	21.43	43.04	8.89	0.70	2.31	23.63	340	36.18	24.96	4.71	0.00	5.65	28.49	122
Primary plus	24.05	46.79	7.60	1.06	0.98	19.54	276	41.63	29.09	4.68	0.70	2.39	21.52	112
Wealth index														
Poorest	24.46	32.80	13.22	0.66	8.94	19.91	179	33.21	22.75	1.44	1.44	17.33	23.83	78
Second	21.34	44.73	9.61	2.54	0.00	21.77	140	43.39	19.08	7.55	2.52	0.00	27.46	46
Middle	23.81	46.40	10.08	0.91	0.91	17.89	137	39.49	21.69	9.82	0.00	2.74	26.26	44
Fourth	25.00	37.09	6.80	0.87	0.15	28.74	172	45.25	9.66	6.44	1.19	4.07	33.39	65
Richest	24.17	53.75	6.78	0.00	0.00	15.31	180	43.52	41.84	1.97	0.00	0.00	12.68	80
All children	23.83	42.40	9.39	0.96	2.59	20.83	808*	40.44	23.93	4.70	1.02	5.91	24.00	313**

[†] Where source of antimalarial could be established; source could not be established for n=90 children as multiple sources of treatment were sought outside of the home.

[‡] The pharmacy category includes part one pharmacies as well as drug shops.

*n=800 for child age; n=783 for caregiver's education

** n=310 for child age; n=302 for caregiver's education

Table 4. Cost of AM treatment for children under five[†]

Median price in USD[‡] paid for a single antimalarial drug regimen acquired for a child with fever.*

	Amodiaquine	SP	Chloroquine	Quinine	First-Line [AL]	ACT	Other AM	All AMs
Source of treatment	\$	\$	\$	\$	\$	\$	\$	\$
Public health facility	0.00 ^[3]	0.00 ^[14]	0.00 ^[31]	0.00 ^[30]	0.00 ^[131]	0.00 ^[131]	-	0.00 ^[209]
Private health facility	0.57 ^[14]	0.48 ^[23]	0.86 ^[105]	1.43 ^[101]	1.19 ^[55]	1.19 ^[55]	2.39 ^[2]	0.96 ^[300]
Pharmacy [#]	1.19 ^[1]	0.96 ^[5]	0.48 ^[24]	0.96 ^[23]	0.48 ^[13]	0.48 ^[13]	-	0.72 ^[66]
Grocery store	-	0.24 ^[1]	0.50 ^[2]	0.76 ^[2]	0.17 ^[2]	0.17 ^[2]	-	0.33 ^[7]
CHW	-	0.00 ^[1]	-	0.00 ^[1]	0.00 ^[15]	0.00 ^[15]	-	0.00 ^[17]
At home	0.00 ^[6]	0.00 ^[12]	0.00 ^[34]	0.10 ^[41]	0.00 ^[66]	0.00 ^[66]	-	0.00 ^[159]
All AMs^{††}	0.14^[27]	0.24^[59]	0.48^[215]	0.96^[225]	0.00^[324]	0.00^[324]	0.00^[3]	0.19^[853]

[†] Where source of antimalarial could be established; source could not be established for n=114 antimalarials as multiple sources of treatment were sought outside of the home.

[‡] 1 USD = 2093.17 UGX at the time of data collection

* Price for n=128 antimalarials was reported as "don't know".

[#] The pharmacy category includes part one pharmacies as well as drug shops.

^{††} Including AMs without source information

Supplementary Indicators

Table 5. Treatment-seeking behaviour

Primary treatment source and reason for seeking treatment at this source among those who sought treatment, among children with fever in the two weeks preceding the survey.

	Percentage of children
Source of treatment	%
Public health facility	14.85
Private health facility	28.60
Pharmacy [‡]	10.37
Grocery store	2.04
Community health worker	1.52
Other source	0.68
Treatment at home	37.47
Did not seek treatment	4.48
Number of children	1,695
Reason for treatment source	
Close by or easy to reach	48.58
Felt illness did not merit more intensive care	12.52
Reputation for quality treatment	8.43
Availability of inexpensive/free treatment	7.65
Availability of modern medicine	6.54
Had medicines available at home	5.66
After hours, could not access health facility	2.99
Other	7.63
Number of children that sought treatment	1,613

[‡] The pharmacy category includes part one pharmacies as well as drug shops.

Table 6. Demand for specific antimalarial drugs

Percentage of children with fever in the two weeks preceding the survey whose caregiver reportedly requested an antimalarial treatment by name, among children that received an antimalarial treatment, by type acquired.

	Percentage of treated children who received an antimalarial requested by their caregiver	# of children treated
Type of AM acquired	%	n
National first-line [AL]	13.50	354
ACT	13.50	354
Amodiaquine	26.39	31
SP/Fansidar	16.97	68
Chloroquine	13.75	247
Quinine	11.16	266
Other AM	14.89	6
All children	14.38*	881*

* Categories are not mutually exclusive; first-line treatment also falls within the ACT category, and n=113 children received more than 1 antimalarial treatment.

Table 7. Relative volumes of AM acquired

Relative volumes of antimalarial treatments acquired for children under 5 with fever in the 2 weeks preceding the survey.

	Relative volumes	# of treatments
AM type	%	n
First-line treatment [AL]	36.04	360
ACT	36.04	360
Amodiaquine	3.27	32
SP/Fansidar	6.78	73
Chloroquine	25.26	260
Quinine	28.16	284
Other AM	0.49	6
Total	*	1,015*

*Categories are not mutually exclusive (first-line treatment also falls within the ACT category).

Table 8. Caregiver knowledge and practices

Percentage of caregivers of children under 5 with fever in the two weeks preceding the survey who had correct knowledge of malaria symptoms and treatment, knew of an outlet where antimalarials can be obtained, had heard of the most common ACT brand[‡], and who stored partial doses.

	Percentage of caregivers
Malaria knowledge	%
Knows that fever is the main symptom of malaria in children under five	75.99
Knows to respond to fever the same or next day	99.14
Knows the full treatment dose is necessary for effectiveness	91.15
Knowledge of treatment source	
Knows where to obtain antimalarials for children under five	91.44
Knowledge of ACTs	
Names Coartem [®] as an antimalarial	57.19
Number of caregivers	1,452 [*]

[‡] Coartem[®] is a national first-line antimalarial [AL] and is the most common ACT brand.

^{*} n=1,418 for responding to fever; n=1,438 for knowing full treatment dose is necessary; and n=1,441 for knowing a treatment source

Table 9. Caregiver beliefs on the most effective AM treatment

Type of antimalarial identified by caregivers of children under five with fever in the two weeks preceding the survey as most effective for malaria in children under five, pregnant women and adults.

	Percentage who cite AM type for children under five	Percentage who cite AM type for pregnant women	Percentage who cite AM type for adults
Antimalarial type	%	%	%
First-line treatment [AL]	35.13	10.15	24.48
ACT	35.13	10.23	24.48
Amodiaquine	1.18	0.23	0.88
SP/Fansidar	3.66	29.98	13.30
Chloroquine	14.33	5.31	14.90
Quinine	22.82	4.61	18.68
Other AM	0.75	0.14	0.29
Non-AM [‡]	<0.01	0.14	0.37
Don't know	22.09	50.37	27.10
Number of caregivers	1,452	1,452	1,452

‡ Medicines identified by the caregiver that are not antimalarials including pain-relievers and fever-reducers

Determinants of Prompt Treatment of Fever in Children Under Five

Several potential determinants of prompt treatment seeking behaviour were explored in this study. Behavioural determinants were measured using scales or indices. Qualitative research among children's caregivers was conducted to identify behavioural determinants related to opportunity, ability and motivation to seek prompt and effective treatment for fever. Focus group discussions and individual in-depth illness narratives were conducted among children's caregivers to identify relevant determinants and develop scale and index items. Items were generated in the vernacular of the target group. Agreement with each scaled item statement was measured on a four-point likert scale (strongly agree, agree, disagree, strongly disagree). Determinants were pilot tested on 200 respondents and psychometric analyses were conducted to refine the scaled items further and ensure reliability of constructs. Scale development was guided by exploratory factor analysis (principal axis factoring with varimax rotation) and scale reliability was assessed using Cronbach's alpha. Mean scale item scores were created. Resulting determinants include:

- Perceived affordability of antimalarials
- Financial support to seek treatment for fever
- Spousal support to seek treatment for fever
- Peer support to seek treatment for fever
- Perceived quality of care on seeking treatment to fever
- Outcome expectations with respect to antimalarials and prompt treatment of fever
- Locus of control over requesting antimalarial treatment (treatment)
- Perceived threat that malaria poses to the community
- Willingness to pay

A summary of all scale items and properties is provided in Appendix D.

A descriptive model included background characteristics of the household, caregiver, child and the potential determinants. Adjusted associations for each determinant were examined. The final model includes only those determinants with significant ($p < 0.05$) or marginally significant ($p < 0.10$) adjusted associations (see Table 10) at 95% confidence level. Significant determinants include:

- **Outcome expectations for antimalarial treatment:** measured with 7 items (see Appendix D) assessing expectations of treatment of fever with an antimalarial drug (e.g. effective treatment, full recovery, quick recovery)
- **Threat of malaria to the community:** measured with 3 items (see Appendix D) assessing threat of malaria to the community in relation to treatment of fever.

These results suggest that children with fever who are significantly more likely to received prompt antimalarial treatment for fever are those with caregivers who 1) have more positive expectations of fever treatment with an antimalarial drug; and 2) perceive malaria as a threat to the community. Household wealth had no significant adjusted association with prompt treatment of fever with an antimalarial.

Table 10. Determinants of prompt treatment of fever in children under five

Adjusted odds ratios predicting treatment of fever with an antimalarial drug the same or next day after onset of fever in children under five with fever in the two weeks preceding the survey.

INDICATORS	Prompt AM treatment (N=716, 44.4%)	No or delayed AM treatment (N=908, 55.6%)	AOR (95% CI)
MOTIVATION	Mean Scores	Mean Scores	
Outcome expectation <ul style="list-style-type: none"> Malaria is quickly cured with antimalarial medicine Children will recover fully from malaria after antimalarial use If a child is given modern antimalarial treatment, they will not get sick again for a long time Using antimalarial drugs will cure malaria in children Antimalarial medicine is effective for treating fever in children under 5 If children complete their malaria treatment, they will not get sick again for a long time Children less than 5 years old who endure simple malaria will be healed after using an antimalarial medicine 	3.84	3.79	1.60 (1.20-2.13)
Threat of malaria to the community <ul style="list-style-type: none"> Malaria is a serious threat to children in my community Malaria is a major problem in my community Malaria is one of the worst diseases in my community 	3.86	3.82	1.35 (1.02-1.79)
POPULATION CHARACTERISTICS	% or Mean scores	% or Mean scores	
Age			
Caregiver	29.6	30.0	0.99 (0.98-1.01)
Child	2.1	1.8	1.16 (1.06-1.27)
Caregiver's Education (Ref: No education)			
Some Primary	51.9	54.2	1.13 (0.87-1.48)
Primary plus	29.1	23.7	1.44 (1.02-2.04)
Wealth index (Ref: Poorest)			
Second	19.8	24.3	0.75 (0.47-1.21)
Middle	19.8	23.1	0.79 (0.53-1.17)
Fourth	22.8	19.9	1.05 (0.64-1.71)
Richest	16.3	12.9	1.18 (0.77-1.82)
Residence			
Rural	65.7	62.3	1.15 (0.78-1.70)
F - Adjusted Mean Residual goodness of fit		1.02	
P- value		0.45	

Appendix A: Treatment-Seeking, Diagnosis & Treatment of Fever among People Age Five & Above

Table A 1. Treatment-seeking, diagnosis and treatment for fever among people age five and above

Percentage of people age five and above with fever in the two weeks preceding the survey who sought treatment for fever. Median price paid for acquired antimalarial regimens in urban and rural areas.*

	Percentage of children age 5-14	Percentage of adults age 15+
AM treatment	%	%
Received an AM	34.94	28.79
Number of children/adults	257	314
	Median price [n] among children age 5-14	Median price [n] among adults age 15+
Median price paid in USD[‡] for acquired AM regimens	\$	\$
Low/moderate endemicity	0.31 ^[32]	0.72 ^[38]
High endemicity	0.57 ^[29]	0.72 ^[19]
First-line treatment [AL]	1.19 ^[9]	3.82 ^[6]
ACT	1.19 ^[9]	3.82 ^[6]
Amodiaquine	0.30 ^[4]	0.48 ^[1]
SP/Fansidar	0.24 ^[8]	0.96 ^[9]
Chloroquine	0.48 ^[22]	0.24 ^[29]
Quinine	0.96 ^[18]	2.39 ^[12]
Other AM	-	-
All AM	0.48 ^[61]	0.72 ^[57]

* Price for n=17 antimalarials was reported as "don't know"

‡ 1 USD = 2093.17 UGX at the time of data collection

Table A 2. Relative volumes of AMs acquired for children age 5 to 14

Relative volumes of full-course antimalarial treatments acquired for children age 5 to 14 with fever in rural and urban areas, by antimalarial type.

	Low/Moderate Endemicity		High Endemicity		All AMs	
	Relative volumes	# of treatments	Relative volumes	# of treatments	Relative volumes	# of treatments
AM type	%	n	%	n	%	n
First-line treatment [AL]	26.00	13	27.45	14	26.92	27
ACT	26.00	13	27.45	14	26.92	27
Amodiaquine	8.00	4	0.00	0	2.91	4
SP/Fansidar	16.00	8	3.92	2	8.31	10
Chloroquine	28.00	14	37.25	19	33.89	33
Quinine	20.00	10	31.37	16	27.24	26
Other AM	2.00	1	0.00	0	0.73	1
Total	*	50*	*	51*	*	101*

*Categories are not mutually exclusive (first-line treatment also falls within the ACT category).

Table A 3. Relative volumes of AMs acquired for people age 15 and above

Relative volumes of full-course antimalarial treatments acquired for people age 15 and above with fever in rural and urban areas, by antimalarial type.

	Low/Moderate Endemicity		High Endemicity		All AMs	
	Relative volumes	# of treatments	Relative volumes	# of treatments	Relative volumes	# of treatments
AM type	%	n	%	n	%	n
First-line treatment [AL]	39.39	26	32.43	12	35.98	38
ACT	39.39	26	32.43	12	35.98	38
Amodiaquine	1.52	1	0.00	0	0.77	1
SP/Fansidar	10.61	7	21.62	8	16.01	15
Chloroquine	33.33	22	27.03	10	30.24	32
Quinine	15.15	10	18.92	7	17.00	17
Other AMs	0.00	0	0.00	0	0.00	0
Total	*	66*	*	37*	*	103*

*Categories are not mutually exclusive (first-line treatment also falls within the ACT category).

Appendix B: Price & Volumes Data for Antimalarials Acquired for Children Under Five in Rural & Urban Areas

Table B 1. Cost of AM treatment for children under five

Median price in USD[†] paid for a single antimalarial drug regimen acquired in urban and rural areas for a child with fever, among children under five.*

	Median price [n] of AMs acquired in low/moderate endemic areas:								Median price [n] of AMs acquired in high endemic areas:							
	Amodia -quine	SP	CQ	Quinine	First- Line [AL]	ACT	Other AM	All AMs	Amodia -quine	SP	CQ	Quinine	First- Line [AL]	ACT	Other AM	All AMs
Source of treatment	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$	\$
Public health facility	0.00 ^[1]	0.00 ^[9]	0.00 ^[15]	0.00 ^[14]	0.00 ^[76]	0.00 ^[76]	-	0.00 ^[115]	0.24 ^[2]	0.00 ^[5]	0.00 ^[16]	0.00 ^[16]	0.00 ^[55]	0.00 ^[55]	-	0.00 ^[94]
Private health facility	1.43 ^[9]	0.72 ^[15]	0.91 ^[56]	1.91 ^[54]	1.19 ^[21]	1.19 ^[21]	2.39 ^[2]	1.19 ^[157]	0.10 ^[5]	0.45 ^[8]	0.72 ^[49]	1.19 ^[47]	0.96 ^[34]	0.96 ^[34]	-	0.96 ^[143]
Pharmacy [#]	1.19 ^[1]	0.14 ^[1]	0.24 ^[9]	1.19 ^[12]	0.72 ^[4]	0.72 ^[4]	-	0.96 ^[27]	-	0.96 ^[4]	0.48 ^[15]	0.43 ^[11]	0.24 ^[9]	0.24 ^[9]	-	0.48 ^[39]
Grocery store	-	0.24 ^[1]	-	0.10 ^[1]	0.00 ^[1]	0.00 ^[1]	-	0.10 ^[3]	-	-	0.50 ^[2]	1.43 ^[1]	0.33 ^[1]	0.33 ^[1]	-	0.64 ^[4]
CHW	-	-	-	0.00 ^[1]	-	-	-	0.00 ^[1]	-	0.00 ^[1]	-	-	0.00 ^[15]	0.00 ^[15]	-	0.00 ^[16]
At home	-	0.00 ^[6]	0.00 ^[21]	0.00 ^[17]	0.00 ^[28]	0.00 ^[28]	-	0.00 ^[72]	0.00 ^[6]	0.17 ^[6]	0.10 ^[13]	0.14 ^[24]	0.00 ^[38]	0.00 ^[38]	-	0.00 ^[87]
All AMs^{††}	1.31^[12]	0.14^[34]	0.48^[109]	1.19^[107]	0.00^[157]	0.00^[157]	0.00^[3]	0.14^[422]	0.10^[15]	0.24^[25]	0.48^[106]	0.50^[118]	0.00^[167]	0.00^[167]	-	0.24^[431]

* Price for n=128 antimalarials was reported as "don't know"; where source of antimalarial could be established - source could not be established for n=114 drugs as multiple sources of treatment were sought outside of the home.

The pharmacy category includes part one pharmacies as well as drug shops.

†† Including AMs without source information

Table B 2. Relative volumes of AMs acquired in high versus low/moderate endemic areas

Relative volumes of antimalarial treatments acquired for children under 5 with fever in the 2 weeks preceding the survey.

	Low/Moderate Endemicity		High Endemicity	
	Relative volumes	# of treatments	Relative volumes	# of treatments
AM type	%	n	%	n
First-line treatment [AL]	33.33	172	37.68	188
ACT	33.33	172	37.68	188
Amodiaquine	2.71	14	3.61	18
SP/Fansidar	8.72	45	5.61	28
Chloroquine	26.94	139	24.25	121
Quinine	27.33	141	28.66	143
Other AM	0.97	5	0.20	1
Total	*	516*	*	499*

*Categories are not mutually exclusive (first-line treatment also falls within the ACT category).

Appendix C: Demographic Characteristics

Table C 1. Demographic characteristics			
Characteristics of children under five with fever in the two weeks preceding the survey, of children's caregivers, and of households			
	Percentage of children under 5	Percentage of people age 5+	Percentage of caregivers
	%	%	%
Residence			
High endemicity	49.32	49.04	48.55
Household wealth index			
Lowest	20.34	21.37	20.39
Second	20.40	22.42	19.42
Middle	19.60	20.32	19.63
Fourth	20.57	19.96	20.32
Highest	19.09	15.94	20.25
Age in years			
Infants (<1 year)	21.37	-	-
1	21.66	-	-
2	19.40	-	-
3	17.42	-	-
4	20.15	-	-
5-14	-	44.93	0.07
15-24	-	17.83	33.79
25-34	-	18.36	41.23
35-44	-	9.09	16.31
45-54	-	4.90	5.30
55+	-	4.90	3.30
Sex			
Female	48.03	77.97	100.00
Caregiver's Education			
No education	-	-	21.85
Some primary	-	-	46.68
Primary or higher	-	-	31.47
Total Number	1,752*	572**	1,453***

* n=1,750 for household wealth; n=1,722 for child age and child sex

**n=571 for endemicity and household wealth

***n=1,452 for household wealth; n=1,446 for education

Appendix D: Behavioural Determinants, Scale Items & Scale Properties

Scale Items	Scale Properties
Affordability	
Treatment for malaria in my community is expensive (R)	Cronbach's Alpha: 0.83 Range: 1-4 Mean (SD): 1.47 (0.69) Median: 1.25
It is difficult to afford anti malarial drugs in my community (R)	
Malaria treatment in private clinics in my community is expensive (R)	
Many people in my community cannot afford malaria treatment (R)	
Financial support	
My friends lend me money for malaria treatment	Cronbach's Alpha: 0.87 Range: 1-4 Mean (SD): 2.95 (0.89) Median: 3.00
Members of my family lend me money for malaria treatment	
My neighbours help me financially in case of malaria	
Neighbours help me with transport when I need to seek treatment for my child	
I can borrow money from my family for malaria treatment	
I can borrow money from my neighbours for malaria treatment	
Spousal support	
The father of the sick child participates in seeking treatment	Cronbach's Alpha: 0.93 Range: 1-4 Mean (SD): 3.31 (1.02) Median: 4.00
The father of the sick child gives me money for treatment	
The father decides the necessity to treat the children	
The father of the child encourages me to see a health provider when the child has fever	
Peer support	
My friends have assisted me in identifying symptoms of fever in my child	Cronbach's Alpha: 0.87 Range: 1-4 Mean (SD): 3.13 (0.80) Median: 3.17
My friends have encouraged me to take my child to a health provider immediately when fever starts	
If my child has a fever, my friends would tell me to take him/her to a health care provider	
People in my neighbourhood have told me how to use antimalarials	
My friends advice me on which antimalarials to use	
My friends have counselled me to use antimalarials	
Quality of care	
Local private clinics in my community do not provide accurate diagnosis (R)	Cronbach's Alpha: 0.86 Range: 1-4 Mean (SD): 2.11 (0.94) Median: 2.00
Malaria treatment at local private clinics is not effective (R)	
Local private clinics do not have well trained personnel (R)	
Local private clinics treat patients poorly (R)	

Scale Items	Scale Properties
Outcome expectations	
Malaria is quickly cured with antimalarial medicine	Cronbach's Alpha: 0.82 Range: 1-4 Mean (SD): 3.81 (0.35) Median: 4.00
Children will recover fully from malaria after antimalarial use	
If a child is given modern antimalarial treatment, they will not get sick again for a long time	
Using antimalarial drugs will cure malaria in children	
Antimalarial medicine is effective for treating fever in children under 5	
If children complete their malaria treatment, they will not get sick again for a long time	
Children less than 5 years old who endure simple malaria will be healed after using an antimalarial medicine	
Threat	
Malaria can lead to death in children, if left untreated	Cronbach's Alpha: 0.80 Range: 1-4 Mean (SD): 3.87 (0.28) Median: 4.00
Fever in children can lead to severe illness, if left untreated	
Malaria is a serious threat to children in my community	
Malaria in children should be treated immediately	
Malaria is a major problem in my community	
Malaria is one of the worst diseases in my community	
If you don't treat fever quickly in a child under 5 they might die	
Willingness to pay	
I am willing to sell my property to get money for malaria treatment	Cronbach's Alpha: 0.78 Range: 1-4 Mean (SD): 3.61 (0.58) Median: 4.00
I am willing to borrow money from family to pay for malaria treatment	
I am willing to borrow money from neighbors to pay for malaria treatment	
I am willing to borrow money at a high interest rate to pay for malaria treatment	
I am willing to work extra jobs to pay for malaria treatment	