REPUBLIC OF KENYA

MONITORING OUTPATIENT MALARIA CASE MANAGEMENT UNDER THE 2010 DIAGNOSTIC AND TREATMENT POLICY IN KENYA

Brief progress report

Division of Malaria Control

Ministry of Public Health & Sanitation

With the support of
The Global Fund to fight AIDS, Tuberculosis and Malaria
&
KEMRI/Wellcome Trust Research Programme, Nairobi, Kenya
&
Management Sciences for Health, Nairobi, Kenya

August 2012

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Kigen S, Memusi D, Mbithi A, Muturi A, Ang'wa N, Otieno G, Githinji S, Zurovac D, Nyandigisi A. *Monitoring outpatient malaria case management under the 2010 diagnostic and treatment policy in Kenya- brief progress report.* Division of Malaria Control, Ministry of Public Health and Sanitation, August 2012.

Published by: Division of Malaria Control
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ACKNOWLEDGMENTS

Funding for this project is provided by The Global Fund to Fight AIDS, Tuberculosis and Malaria round 4 grant number KEN-405-G06-M and U.S. President's Malaria Initiative/USAID through the Management Sciences for Health. DZ is grateful for the support from the Wellcome Trust-UK, Kenya Medical Research Institute, University of Oxford and Medicines for Malaria Ventures. The authors of this report would like to thank all DOMC personnel who participated at various stages of the project. Finally, our sincere gratitude to all data entry clerks, supervisors, data collectors, health workers, patients and caretakers of children who participated in the study.

SUMMARY

Malaria case-management based on confirmed parasitological diagnosis and artemisinin-based combination therapy (ACT) is the cornerstone of the 2009-2017 National Malaria Strategy (NMS) in Kenya. By 2013, the NMS specified programmatic directions to ensure universal availability of ACTs and diagnostics, universal coverage of health facilities and health workers with health systems support activities, and universal health worker's adherence to malaria case-management guidelines. To monitor the policy progress, the MoPH's Division of Malaria Control undertook four national health facility surveys. The baseline survey was carried out in January/February 2010 and the last follow-up survey in March/April 2012. This brief report presents the progress in key health systems and case-management indicators in this period.

The baseline and three follow-up surveys were respectively undertaken at 174, 176, 174 and 172 public facilities randomly sampled countrywide. The results showed that total AL stock-out over the monitoring period was on average 12% with monthly variations between 3% and 20%. In the same period the stock-out of at least one AL pack was 40% and varied monthly between 28% and 59%. During all surveys over three-quarters of facilities had various drug inventory materials however the quality of antimalarial drug recording and reporting was substantially lower. With respect to malaria diagnostics, some improvements between the baseline and the last survey were observed – the availability of at least one malaria diagnostic service increased from 55% to 65%, mainly due to increase in the availability of RDTs (7.5% vs 16.9%). Only minor changes were observed in the provision of microscopy (51% vs 54%).

Health facility and health workers coverage with guidelines, wall charts, in-service training and supervisory activities was variable. In comparison with the baseline results when health workers were neither trained on the new case-management policy nor had access to new guidelines and wall charts, the last survey revealed that the coverage with the in-service training, national guidelines and new case-management wall charts increased to 28%, 45% and 15-54% respectively. Regarding the supervision, there was an increase from 42% to 61% of health workers who received any supervisory visit; however malaria case-management activities and observation of consultations were less commonly components of these visits.

The case-management results have shown improvement trends in the management of febrile patients. The composite performance defined as febrile patient tested and treated in accordance with national

guidelines increased from 16% to 28% at all study facilities and from 28% to 44% at facilities with diagnostics and AL in stock. At the latter facilities, despite a low performance of the composite indicator, improvements were observed in testing of febrile patients (43% to 58%), recommended treatment for test positive patients (83% to 89%) and absence of antimalarial treatment for test negative patients (47% to 69%). With the respect to AL dosing, dispensing and counseling practices changes observed were minor. However correct AL dosing was high throughout the period, four out of seven dispensing and counseling tasks were performed for more than two-thirds of the patients, while the main tasks that require substantial improvements were administration of the first AL dose at health facility (42%), provision of advice on what to do in case of vomiting (6%) and weighing of the patients (52%).

In conclusion, the findings revealed that most of the key indicators have shown some improvement by April 2012 however the changes were modest and still well below the 2013 targets aiming at universal intervention coverage and adherence practices (Annex 1-3). To effectively reduce the gap in reasonable time the following recommendations are made:

- Implementation of RDTs must be urgently scaled up as part of the existing national RDT implementation plan containing comprehensive package of case-management interventions.
- Quality control for malaria microscopy and RDTs supported by field supervision should be implemented in line with the national policy guidelines for parasitological diagnosis of malaria.
- The future case-management trainings for health workers should be aligned with RDT implementation while routine supervision should include malaria case-management component and be quantitatively increased and qualitatively improved in line with supervisory manuals.
- The new national malaria case-management guidelines and wall charts should be repeatedly disseminated to the peripheral health facilities.
- Drug management activities should focus on strengthening of logistic management information systems and development of district capacities to respond to stock-out warnings.
- An emphasis should be placed on the following case-management messages during the in-service training and supervisory visits: 1) all febrile patients should be tested, 2) test negative patients should not be treated for malaria, 3) all patients should be weighed, 4) the first AL dose should be administered at facilities even in the absence of food, and 5) patients should be advised to return for replacement dose to complete full treatment course in case of vomiting.

1. BACKGROUND

Effective malaria case-management based on confirmed parasitological diagnosis and artemisinin-based combination therapy (ACT) is the cornerstone of the 2009-2017 National Malaria Strategy (NMS) in Kenya (MOPHS 2009a). The NMS launched in November 2009, specified programmatic directions to ensure availability of ACTs, malaria diagnostics and effective case-management based on the use of malaria microscopy or rapid diagnostic tests (RDT) for all febrile patients and subsequent treatment of only test positive patients with nationally recommended first-line ACT, artemether-lumefantrine (AL).

Alongside the NMS, the national Malaria Monitoring and Evaluation (M&E) Plan 2009-2017 has also been developed. The M&E plan has specified that, by 2013, 100% of health facilities should have AL and malaria diagnostics and 100% of fever cases who present to health workers should receive parasitological diagnosis and effective treatment (MOPHS 2009b). As part of the new NMS and M&E plan, nationally representative monitoring surveys undertaken on biannual basis are undertaken to capture case-management indicators and timely inform national policy makers, and donor organizations, on the progress of the new NMS. By the end of April 2012, four health facility surveys were performed. The first, baseline survey, was undertaken prior to the implementation activities under the new NMS. This brief report presents progress in the key malaria-related health systems and case-management indicators in this period.

2. METHODS

The methodological details were provided in the previous reports (Memusi et al. 2010; Nyandigisi et al. 2011). Briefly, cross-sectional health facility surveys were undertaken. National representativeness was assured drawing a stratified random sample of the public health facilities. Prior to the surveys the training of data collectors was undertaken over five days. At each of the survey facilities data were collected over one day using three methods. First, all patients presenting to the outpatient departments during the survey day underwent rapid screening when they were ready to leave the facility. All non-referred and non-pregnant febrile patients presenting for an initial visit and weighing ≥5kg proceeded with an evaluation during which information was collected about main patients' characteristics, diagnostics requested, results reported and medications prescribed and dispensed. Second, each facility was assessed to determine the availability of medicines, RDTs, malaria microscopy as well as the support tools such as weighing scales, guidelines, job-aids and medicine inventory materials. Finally all health

workers who saw patients on the survey day were interviewed about their demographics, pre-service training, access to guidelines, and retrospective exposure to in-service training and supervision.

3. RESULTS

3.1. Study populations

The first, baseline survey, was carried out in January/February 2010. Subsequently, three follow-up surveys were respectively undertaken in November/December 2010, July/August 2011 and March/April 2012. The Table 1 presents numbers of assessed facilities, interviewed health workers and evaluated outpatient consultations for patients who met inclusion criteria in each of four surveys.

Table 1: Number of health facilities assessed, health worker interviews performed and outpatient consultations evaluated for patients at all facilities and facilities with commodities in stock, by survey

Survey	HFs assessed	HWs interviewed	Outpatient consultations at all HFs		Outpatient consultations at HFs with diagnostics and AL in stock	
			<5 years	≥5 years	<5 years	≥5 years
Baseline	174	224	1,070	1,335	591	648
Follow-up 1	176	237	675	781	420	441
Follow-up 2	174	233	535	673	301	333
Follow-up 3	172	220	581	710	340	428

3.2. Health systems support

The results presented in this section compare the key health facility and health worker characteristics important for the performance of adequate malaria case-management between four surveys.

3.2.1. Availability of basic equipment and malaria diagnostics

Four different types of weighing scales were found at health facilities and the majority of facilities had each type of scale during all surveys (Table 2). At least one functional thermometer was present at the large majority of facilities during all surveys. An increase in overall capacities of health facilities to provide parasitological malaria diagnosis was observed between the baseline and the last follow-up survey (55.2% vs 65.1%) mainly due to increase in the availability of RDTs (7.5% vs 16.9%). The availability of functional malaria microscopy was without significant changes between the surveys.

Table 2: Availability of basic equipment and malaria diagnostics

	Baseline N=174 (%)	Follow-up 1 N=176 (%)	Follow-up 2 N=174 (%)	Follow-up 3 N=172 (%)	% change B vs FU3
Availability of weighing scales					
Salter hanging scale	58.1	61.4	64.9	61.1	+3.0
Infant scale	83.9	80.1	79.3	79.7	-4.2
Bathroom scale	75.9	69.9	69.0	63.4	-12.5
Balance scale	50.6	50.6	54.0	58.1	+7.5
Availability of thermometer	90.8	90.3	93.1	87.2	-3.6
Availability of diagnostics					
Functional malaria microscopy	50.6	53.4	54.0	53.5	+2.9
Non-expired malaria RDT	7.5	8.5	12.6	16.9	+9.4
Expired malaria RDTs	3.5	0.6	1.2	0.0	-3.5
Any functional diagnostics	55.2	58.0	58.6	65.1	+9.9

Retrospective availability of malaria diagnostic services was assessed for 3 months period prior to the surveys. The new malaria policy recommends universal parasitological diagnosis, using either malaria microscopy or RDTs. Therefore, comparing all facility results between baseline and follow-up surveys, the results showed a decrease trend (46.6% vs 42.1% vs 40.8% vs 32.0) in the absence of both malaria diagnostic service in duration of at least 7 consecutive days. Among health facilities which had functional microscopy on survey days, an absence of this service prior to the surveys was similarly distributed (9.1% vs 5.3% vs 9.6% vs 3.3%). Finally, at facilities providing malaria microscopy services an increase in the quality control visits that took place at least once in 3 months prior to the surveys was observed (from 9.1% at baseline to 22.8% at the last follow-up). Similarly at facilities providing RDT testing, there was also some increase in the facilities receiving a supervisory visit on the use of RDTs (5.3% vs 20.7%).

Highlight: Malaria diagnostic capacities

KEY FINDINGS:

By April 2012, 65% of facilities provided at least one malaria diagnostic service, largely through malaria microscopy (54%) while RDTs were rarely available (17%). At facilities with microscopy there was an increase from 9% to 23% of facilities receiving quality control visit. At facilities with RDTs there was also an increase in supervisory visits on the use of RDTs (5% to 21%). However, overall quality control activities were low for both diagnostic services.

IMPLICATIONS:

To ensure universal access to malaria diagnostic services, RDTs should be procured in sufficient quantities and supplied to peripheral facilities. The quality control system for malaria diagnostics should be scaled-up in line with the national policy for parasitological diagnosis of malaria.

3.2.2. Availability of antimalarial drugs

The physical stock assessments showed that the availability of at least one AL pack was relatively high at facilities (survey range: 89-97%), however facilities less commonly had all four packs in stocks (survey range: 45-72%)(Table 3). Trend analysis on 26 monitoring points combining monthly AL availability data from physical surveys and follow-up monthly phone calls at the same facilities shows that in average 11.5% of facilities had total AL stock-out (monthly range: 3-20%) while an average stock-out of at least one AL pack was substantially higher – 40.1% (monthly range: 28-59%) (Figure 1).

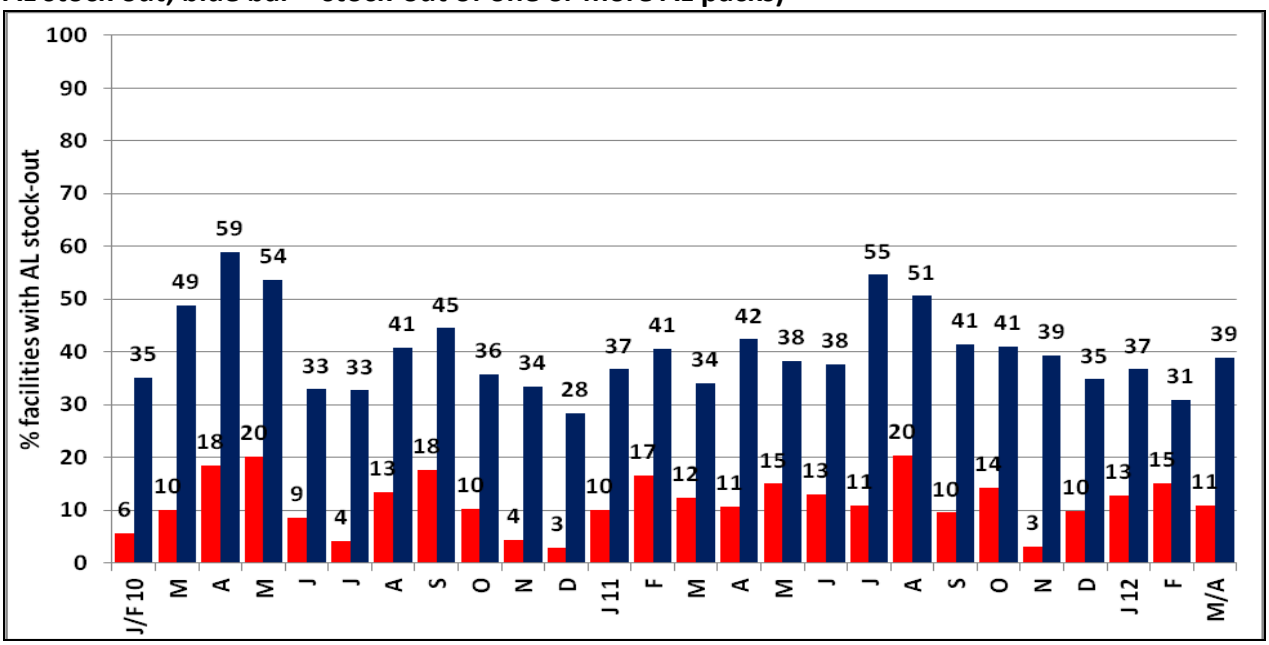
With respect to other antimalarials, the availability of SP declined from 88.5% at baseline to 72.5% at the last follow-up survey. Interestingly, during the last survey in 2012, SP was found at 76.3% of facilities in IPTp districts but also at 70.5% of facilities in districts where IPTp was discontinued during 2010. During the last survey only 1 (0.6%) facility stocked dehydroartemisinine-piperaquine and only 2 (1.2%) facilities stocked injectable artesunate, the respective treatments nationally recommended during 2010 (but not yet supplied) for the management of treatment failures and severe malaria. Finally, during all survey rounds, expired antimalarial drugs were uncommon, though an increase trend in the availability of at least one expired AL pack was observed (2.9% at baseline to 14.0% at the last survey).

Table 3: Facilities with non-expired antimalarial drugs in stock

	Baseline N=174 (%)	Follow-up 1 N=176 (%)	Follow-up 2 N=174 (%)	Follow-up 3 N=172 (%)	% change B vs FU3
Any AL pack	94.3	97.2	89.1	93.0	-1.3
All AL packs	64.9	71.6	45.4	61.1	-3.8
AL 6 pack	81.0	89.2	78.2	78.5	-2.5
AL 12 pack	79.9	86.4	59.8	73.3	-6.6
AL 18 pack	79.3	81.8	66.7	72.7	-6.6
AL 24 pack	86.2	86.9	73.6	85.5	-0.7
SP tablets	88.5	88.0[a]	73.6	72.5[a]	-16.0
Quinine tablets	69.0	84.6[a]	80.5	83.5[b]	+14.5
Quinine injections	77.6	84.5[b]	78.6	69.0[a]	-8.6

[a] Denominator does not include 1 health facility without information
[b] Denominator does not include 2 health facilities without information

Figure 1: Monthly trend (Jan 2010-April 2012) in stock-outs of non-expired AL (red bar – total AL stock out; blue bar – stock-out of one or more AL packs)



Finally, retrospective stock-out data were collected for periods prior to the physical surveys. For this indicator the stock-out of at least 7 consecutive days over 3 months period was used as the criterion for the stock-out presence. Comparing baseline and the last survey results simultaneous stock-out of all four AL packs decreased from 27.2% to 9.4%, stock out of one or more AL packs from 59.5% to 39.0%, while stock-outs of individual AL packs ranging prior to baseline between 37.6-52.0% decreased to 19.9-29.8% prior to the last survey.

3.2.3. Availability and completeness of antimalarial drug management records

During all surveys, the availability of antimalarial drug management inventory materials was relatively high, ranging from 74.7% to 91.3% (Table 4). However updating and completing of the inventory materials was less common. This was particularly marked for stock cards and AL dispenser books. While 66.7% of facilities had AL dispenser book updated for the last one month prior to the baseline survey, only half (51.2%), however, had it fully updated for one month prior to the last follow-up survey.

Table 4: Availability and quality of antimalarial drug management records

	Baseline N=174 (%)	Follow-up 1 N=176 (%)	Follow-up 2 N=174 (%)	Follow-up 3 N=172 (%)	% change B vs FU3
Stock cards available	86.2	77.3	74.7	79.7	-6.5
Stock cards updated (1m)	44.8	38.6	44.3	42.4	-2.4
AL dispenser book available	89.7	86.9	85.6	91.3	+1.6
AL book updated (1m)	66.7	45.5	47.7	51.2	-15.5
Monthly summary form available	81.5[a]	76.1	79.9	76.2	-5.3
Summary form completed (3m)	65.9[a]	59.1	69.0	57.6	-8.3

[a] Denominator does not include one facility with missing value

Highlight: Availability of antimalarial medicines and antimalarial drug management

KEY FINDINGS:

Despite some declines in AL stock-outs, the average proportion of stocked out facilities over the monitoring period between January 2010 and April 2012 was high. The total stock-out was present at 12% of facilities with monthly variations of 3-20%. The average stock-out of at least one AL pack was 40% and varied monthly between 28% and 59%. The quality of antimalarial drug recording and reporting was suboptimal throughout the period.

IMPLICATIONS:

Future drug management activities should focus on improving routine recording and reporting, strengthening of district capacities to respond to stock-outs and scaling-up of stock monitoring interventions based on mobile phone technologies which have shown massive impact on stock-outs in pilot districts. Elimination of stock-outs should be also viewed alongside the scale-up of the "test and treat" case-management policy and rational use of antimalarial drugs.

3.2.4. Availability of guidelines and job aids

The new national malaria guideline for health workers was officially launched in September 2010 and subsequently disseminated nationwide. The wall chart on malaria outpatient algorithm specifying new malaria diagnostic recommendations was finalized in 2010 and disseminated in the first half of 2011. The coverage of health facilities with new guidelines increased from 5.7% at the first follow-up survey to 45.3% during the last survey while the coverage of health facilities with the new diagnostic algorithm charts was 15.1% at the last survey. The availability of AL dosing and dispensing chart, which was produced prior to the launch of the new policy, increased from 36.8% at baseline to 54.1% at the last survey. Simultaneously, some decline trend was observed in the availability of obsolete guidelines and wall charts. The proportion of facilities having displayed old algorithm charts promoting presumptive treatment in children decreased from 44.8% to 30.8% while the availability of old malaria guidelines providing the same presumptive recommendations decreased from 69.5% to 52.9%.

Highlight: Availability of new case-management guidelines and wall charts

KEY FINDINGS:

By April 2012, 45% of facilities had new malaria case-management guidelines. AL dosing and dispensing charts were displayed at 54% of facilities, however the charts with the new diagnostic algorithms were available at only 15% of facilities. Despite a declining trend, old guidelines and wall charts are still available at substantial proportion of health facilities.

IMPLICATIONS:

The coverage with new national malaria case-management guidelines and wall charts has significantly increased however it is still far below universal targets. These job aids should be repeatedly disseminated to the peripheral health facilities through the implementation channels such as in-service training for health workers and KEMSA supply chains. The obsolete guidelines and wall charts should be removed from health facilities.

3.2.5. Health workers' exposure to in-service training and supervision

General characteristics of outpatient health workers who saw patients on survey days were similar. During all surveys the majority of health workers were female (survey range: 53-54%), health workers not in-charge of facilities (survey range: 54-58%) and by cadre nurses (survey range: 62-65%) followed by clinical officers (survey range: 28-31%).

The main case-management activity undertaken in 2010 and taking place between the baseline and the first follow-up survey was a nationwide training for front-line health workers. The first follow-up survey showed that 21.5% of health workers were trained on the new case-management policy and in the absence of major subsequent trainings programmes, this coverage has not substantially increased at the time of the last survey in 2012 (27.7%) (Table 5).

With respect to the supervision, there was a significant increase from 41.5% of health workers receiving at least one supervisory visit in 3 months prior to the baseline to 60.5% prior to the last follow-up survey. However, only minor increases were observed in the supervisory visits that included malaria case-management and observations of outpatient consultations. During the last follow-up survey the overall coverage with malaria related supervisory activities was low (Table 5).

Table 5: Health workers exposure to in-service training and supervision

	Baseline N=224 (%)	Follow-up 1 N=237 (%)	Follow-up 2 N=233 (%)	Follow-up 3 N=220 (%)	% change B vs FU3
In–service training					
Trained on new CM policy	0	21.5	24.9	27.7	+27.7
Supervision					
Any supervisory visit in past 3m	41.5	51.9	61.4	60.5	+19.0
Any visit including malaria CM	17.9	13.9	33.1	21.8	+3.9
Had visit including observations	6.7	6.8	11.2	11.4	+4.7

Highlight: Health workers' coverage with in-service training and supervision

KEY FINDINGS:
The coverage of outpatient health workers trained on the new case-management policy is 28%. Despite an increase in health workers exposure to the supervision, the coverage of visits including malaria case-management (22%) and observations of consultations (11%) is low.
IMPLICATIONS:
The coverage of trained health workers on the new case-management policy should be urgently increased and the opportunity lies in the forthcoming large scale implementation of RDTs. Routine supervisory activities at district level should be quantitatively increased and qualitatively improved in line with recently produced supervisory manuals for malaria.

3.3. Malaria case-management

This section presents results on the case-management practices for febrile, non-pregnant patients weighing ≥5kg and presenting for an initial outpatient visit without being referred for hospitalization. The presentation of the results followed the multi-level analytic approach of the study. First, to assess the performance of the new case-management policy the results are presented from all health facilities regardless of the availability of case-management commodities. Second, to assess health workers adherence to the new guidelines the same results were restricted to the facilities where AL and diagnostics were in stock on the survey day. Third, at facilities with available AL, the quality of AL dosage prescriptions, and the quality of dispensing and counseling practices was respectively restricted to patients who had AL prescribed and to those who had both, AL prescribed and dispensed at facility. Finally, case-management results were stratified for children below 5 and above 5 years of age.

3.3.1. Main patients' characteristics

Main patients' characteristics were similar between surveys with respect to patients' sex, age, weight, body temperature and prior use of antimalarial drugs (Table 6).

Table 6: Main characteristics of febrile patients across surveys

	Baseline N=2,405 (%)	Follow-up 1 N=1,456 (%)	Follow-up 2 N=1,208 (%)	Follow-up 3 N=1,291 (%)
Female	56.1	53.8	55.3	57.9
Age				
<1 year	12.0	13.7	9.3	13.5
1-4 years	32.5	32.6	35.0	31.5
5-14 years	21.1	18.1	18.8	19.2
≥15 years	34.4	35.5	36.9	35.8
Weight[a]				
5-14 kg	41.0	41.4	39.1	41.7
15-24 kg	17.1	17.3	16.8	15.5
25-34 kg	5.0	4.3	4.2	4.6
≥35 kg	37.0	36.7	38.9	38.3
Temperature ≥37.5ºC[c]	26.3	31.1	30.9	23.8
Prior use of any AM	5.0	4.6	4.6	3.3
Prior use of AL	1.9	1.5	2.4	2.4
Prior use of complete AL dose	0.5	0.6	1.2	0.6

[a] Denominator does not include 2 patients with missing values during the follow-up 1 survey
[c] Denominator does not include 1 patient with missing value during the follow-up 1 survey

3.3.2. Performance of the new diagnostic and treatment policy

The national case-management guidelines recommend that 1) "*all patients with fever or history of fever should be tested for malaria and only patients who test positive should be treated for malaria*" and 2) *"the recommended first line treatment for uncomplicated malaria is artemether-lumefantrine"* (MOPHS 2010). We considered composite case-management performance in line with guidelines if the following criteria were met: 1) febrile patient was tested for malaria; 2) if positive test result was reported patient was treated with AL, and 3) if negative test result was reported patient was not treated for malaria.

Overall, at all study facilities the composite performance increased from 15.7% at the baseline to 28.4% at the last follow-up survey (Table 7). The same upward trend was observed in children below 5 years (11.8% vs 23.6%) and in patients 5 years and older (18.9% vs 32.3%). A similar increasing trend was observed in testing rates of febrile patients – from 23.9% at the baseline to 37.4% at the last follow-up survey. Testing rates in children below 5 years increased from 20.5% to 31.5% while performance of the same task for patients 5 years and older improved from 26.7% to 42.3%.

Stratified analysis by the use and result of malaria test provides further light on the case-management practices (Table 7). First, recommended AL treatment for test positive patients was relatively high but

not entirely followed. The adherence varied over time with only minor increase between the baseline and the last follow-up survey (82.7% vs 85.9%). The treatment with the combination of AL and quinine was common for test positive patients during three survey rounds (range: 9.9-12.2%) with an exception observed only during the first follow-up survey (1%). Second, among patients with negative test result, fewer patients were treated for malaria during the last survey compared to the baseline (30.8% vs 52.1%). The decline in this practice was seen in both age groups – in children below 5 years (56.7% vs 30.7%) and in patients 5 years and older (48.7% tvs 30.9%). Finally, despite 18% decline in antimalarial prescriptions observed among patients without malaria test performed, nearly half (49.5%) of these patients were however treated for malaria during the last survey (Table 7).

Table 7: Performance of the new case-management policy - diagnostic and treatment practices for febrile patients presenting to all health facilities regardless of the availability of commodities

	Baseline N=2,405 (%)	Follow-up 1 N=1,456 (%)	Follow-up 2 N=1,208 (%)	Follow-up 3 N=1,291 (%)	% change B vs FU3
Composite performance	15.7	22.1	25.1	28.4	+12.7
Malaria test performed	23.9	30.9	36.8	37.4	+13.5
Rx among test positives	**N=295**	**N=212**	**N=205**	**N=191**	
AL	82.7	89.2	69.8	85.9	+3.2
AL+QN	10.2	0.9	12.2	9.9	-0.3
QN	4.1	3.3	12.7	1.6	-2.5
Other AM	2.4	3.8	2.9	1.0	-1.4
No AM prescribed	0.7	2.8	2.4	1.6	+0.9
Rx among test negatives	**N=280**	**N=238**	**N=239**	**N=292**	
AL	34.6	39.9	24.3	25.7	-8.9
SP	11.4	3.4	2.5	1.7	-9.7
AL+QN	2.9	0	1.3	2.1	-0.8
QN	1.8	0.4	1.7	0.7	-1.1
Other AM	1.4	0.8	0.4	0.7	-0.7
No AM prescribed	47.9	55.5	69.8	69.2	+21.3
Any AM prescribed	52.1	44.5	30.3	30.8	-21.3
Rx when test not done	**N=1,830**	**N=1,006**	**N=764**	**N=808**	
AL	59.8	55.4	48.2	45.7	-14.1
AL+QN	3.1	1.5	2.8	1.7	-1.4
SP	2.9	1.4	2.5	1.2	-1.7
QN	1.6	1.1	2.9	0.4	-1.2
Other AM	0.5	0.5	0.3	0.5	0.0
No AM prescribed	32.2	40.2	43.3	50.5	+18.3
Any AM prescribed	67.8	59.8	56.8	49.5	-18.3

3.3.3. Health workers adherence to the new diagnostic and treatment guidelines

This section reports health workers case-management practices from facilities where diagnostics and AL were in stock during the surveys (Table 8). At these facilities, the performance of the composite case-management indicator improved from 28.1% at the baseline to 44.3% during the last follow-up survey, while testing rates increased from 42.5% to 57.8%. In children below 5 years of age the composite performance improved from 19.3% to 37.9% while testing rates increased from 33.3% to 50.6%. In patients 5 years and older the composite performance improved from 36.1% to 49.3% while testing rates increased from 50.8% to 63.6%.

Since AL was absent from the stock in only 6-11% of facilities across surveys, the key indicators on treatment practices for test positive and test negative patients were similar to the patterns observed at all facilities. In summary, at these facilities AL treatment for test positive patients increased from 83.3% at the baseline to 88.6% at the last follow-up survey while in the same period antimalarial treatment for test negative patients decreased from 52.8% to 31.2% (Table 8). Among febrile patients without test performed, a substantial decline (27.6%) in prescriptions of antimalarial treatments was also observed. However, by the end of the monitoring period and despite the availability of diagnostics at these facilities, 36.1% of patients in this category were still treated for malaria (Table 8).

Table 8: Health workers adherence to guidelines - diagnostic and treatment practices for febrile patients presenting to facilities where malaria diagnostic services were available and AL was in stock

	Baseline N=1,239 (%)	Follow-up 1 N=861 (%)	Follow-up 2 N=634 (%)	Follow-up 3 N=769 (%)	% change B vs FU3
Composite performance	28.1	35.5	40.2	44.3	+16.2
Malaria test performed	42.5	49.5	56.9	57.8	+15.3
Rx among test positives	**N=276**	**N=201**	**N=154**	**N=175**	
AL	83.3	89.6	75.3	88.6	+5.3
AL+QN	10.5	1.0	14.9	8.6	+1.9
QN	4.0	3.5	5.2	1.1	-2.9
Other AM	1.5	3.5	2.0	1.1	-0.4
No AM prescribed	0.7	2.5	2.6	0.6	-0.1
Rx among test negatives	**N=250**	**N=225**	**N=205**	**N=269**	
AL	35.6	40.4	23.9	26.4	-9.2
SP	10.8	2.7	2.9	1.9	-8.9
AL+QN	3.2	0	1.5	1.5	-1.7
QN	2.0	0.4	1.5	0.7	-1.3
Other AM	1.2	0.4	0.5	0.7	-0.5
No AM prescribed	47.2	56.0	69.8	68.8	+21.6
Any AM prescribed	52.8	44.0	30.2	31.2	-21.6
Rx when test not done	**N=713**	**N=435**	**N=275**	**N=324**	
AL	55.3	42.3	36.7	32.4	-22.9
AL+QN	3.2	1.2	1.1	0.3	-2.9
SP	3.0	1.6	0.7	1.9	-1.1
QN	1.5	0.7	1.1	0.6	-0.9
Other AM	0.7	0	0.4	0.9	+0.2
No AM prescribed	36.3	54.3	60.0	63.9	+27.6
Any AM prescribed	63.7	45.8	40.0	36.1	-27.6

Highlight: Case-management policy performance and health workers adherence

KEY FINDINGS:

A) The composite case-management performance - measured at all facilities regardless of the availability of the commodities as an indicator of the policy performance - increased from 16% to 28%. The changes in individual case-management components were as follows: 1) testing rates increased from 24% to 37%, 2) treatment of test positive patients with AL increased from 83% to 86%, and 3) antimalarial treatment of test negative patients decreased from 52% to 31%.

B) The same composite performance - measured at facilities where malaria diagnostics and AL are available as an indicator of the health workers adherence - increased from 28% to 44%. At these facilities the changes in individual case-management components were as follows: 1) testing rates increased from 43% to 58%, 2) treatment of test positive patients with AL incresed from 83% to 89%, and 3) antimalarial treatment of test negative patients decreased from 53% to 31%.

IMPLICATIONS:

Despite an improvement trend observed by April 2012, the composite performance is still low. The reasons for low policy performance are absence of diagnostics, suboptimal testing rates, and some non-adherence to both test positive and test negative results. To bridge the gap the future activities should focus on 1) supply of diagnostics to all health facilities and 2) reinforcement of clinical practices during the in-service training, supervisory visits and IEC campaigns targeting health workers to increase testing of febrile patients and treatment adherence to test results.

3.3.4. Correctness of AL dosing

The correctness of AL dosage prescriptions were assessed in comparison with guidelines dosage recommendations for four weight-specific AL categories. They were classified as: 1) recommended, 2) overdosed, and 3) underdosed prescriptions. The baseline values for AL prescribing in recommended dose were high (89%). Yet an increase trend in the correct dosing was observed (Table 9). During the last follow-up survey 97.7% of patients were correctly dosed for their weight - the proportion similar in children below 5 years of age (99.1%) and patients 5 years and older (96.7%). Finally, we also observed a decline in overall prescriptions of AL below recommended dose (7.2% vs 0.2%) (Table 9).

Table 9: Correctness of weight-specific AL dosing for patients who had AL prescribed

	Baseline N=1,328[a] (%)	Follow-up 1 N=839 (%)	Follow-up 2 N=569[c] (%)	Follow-up 3 N=568[d] (%)	% change B vs FU2
Recommended dose	89.2	92.4	92.8	97.7	+8.5
Underdose	7.2	4.4	3.7	0.2	-7.0
Overdose	3.7	3.2	3.5	2.1	-1.6

[a] Denominators do not include incomplete AL prescriptions (107 at baseline, 2 at FU-2 and 40 at FU-3)

Highlight: Correctness of AL dosing

KEY FINDINGS:
An improvement trend was observed in AL prescribing in accordance with weight-specific recommendations. During all survey rounds the large majority (89-97%) of patients had AL correctly prescribed while underdosed and overdosed prescriptions were very rare (0-7%).
IMPLICATIONS:
Correct weight-based dosing is a critical pre-requisite to ensure high rates of AL treatment success. The optimistic findings observed by April 2012 should be regularly monitored.

3.3.5. Dispensing and counseling practices

The quality of AL dispensing and counseling was evaluated for 7 performance tasks specified in national malaria guidelines and training manuals. The changes were minor with an exception of the administration of the first AL dose at the facility which improved by 10% between the baseline and the last follow-up survey (Table 10). Overall, of 7 tasks measured during the last survey 4 were performed for more than two-thirds of the patients - advice on dosing (94.6%), advice on the second dose after 8 hours (76.6%), advice on taking AL after the meal (71.5%) and advice on completing all doses (87.0%). In the same period the remaining 3 tasks were less commonly performed - weighing of patients (51.7%), administration of the first dose at health facility (41.7%), and advice on vomiting (6.4%) (Table 10).

Table 10: Dispensing and counseling practices among patients who had AL dispensed

	Baseline N=1,408 (%)	Follow-up 1 N=797 (%)	Follow-up 2 N=478 (%)	Follow-up 3 N=576 (%)	% change B vs FU3
Weight measured	51.8	53.6[a]	52.5	51.7	-0.1
First dose given at facility	32.1	26.9	37.5	41.7	+9.6
Dosage explained	96.2	92.8	94.4	94.6	-1.6
Told to take 2nd dose after 8hrs	76.0	64.7	78.2	76.6	+0.6
Told to take drugs after meal	66.9	60.5	68.4	71.5	+4.6
Told what to do if vomiting	6.3	5.9	4.6	6.4	+0.1
Told to complete all doses	80.3	82.4	85.4	87.0	+6.7

[a] Denominator does not include 2 observations with missing values

Highlight: AL dispensing and counseling practices

KEY FINDINGS:
Only minor improvements were observed in the performance of dispensing and counseling tasks. The main tasks that require substantial improvements include provision of advice on what to do in case of vomiting (6%), administration of the first AL dose at the facility (42%) and weighing of patients (52%).
IMPLICATIONS:
The performance of recommended AL dispensing and counseling tasks is important to ensure high rates of patients' adherence and treatment success. The future in-service training, supervisory and IEC activities should focus on these tasks.

4. CONCLUSION AND RECOMMENDATIONS

The findings of four rounds of national surveys revealed that most of the key indicators measured in this study have shown some improvement by April 2012 however the changes were modest. Importantly most of the key indicators are still well below the 2013 targets aiming at universal availability of malaria case-management commodities, universal coverage of health facilities and health workers with malaria related health systems support activities and universal health worker's adherence to national outpatient guidelines for malaria diagnosis, treatment, counseling, and drug dispensing (Annex 1-3). To effectively reduce the gap in reasonable time the following recommendations are made:

- Implementation of RDTs must be urgently scaled up as part of the existing national RDT implementation plan containing comprehensive package of case-management interventions.
- Quality control for malaria microscopy and RDTs supported by field supervision should be implemented in line with the national policy guidelines for parasitological diagnosis of malaria.
- The future case-management trainings for health workers should be aligned with RDT implementation while routine supervision should include malaria case-management component and be quantitatively increased and qualitatively improved in line with supervisory manuals.

- The new national malaria case-management guidelines and wall charts should be repeatedly disseminated to the peripheral health facilities.
- Drug management activities should focus on strengthening of logistic management information systems and development of district capacities to respond to stock-out warnings.
- An emphasis should be placed on the following case-management messages during the in-service training and supervisory visits: 1) all febrile patients should be tested, 2) test negative patients should not be treated for malaria, 3) all patients should be weighed, 4) the first AL dose should be administered at facilities even in the absence of food, and 5) patients should be advised to return for replacement dose to complete full treatment course in case of vomiting.

5. REFERENCES

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Annex 1: Summary of key health systems support M&E indicators

Health systems support M&E indicators	2010 Rd 1	2010 Rd2	2011 Rd 3	2012 Rd 4	Target 2013
% of facilities with AL stock out on survey day					**0**
All AL packs	**5.7**	**2.8**	**10.9**	**7.0**	**0**
AL 6 pack	**19.0**	**10.8**	**21.8**	**21.5**	**0**
AL 12 pack	**20.1**	**13.6**	**40.2**	**26.7**	**0**
AL 18 pack	**20.7**	**18.2**	**33.3**	**27.3**	**0**
AL 24 pack	**13.8**	**13.1**	**26.4**	**14.5**	**0**
Any AL pack	**35.1**	**28.4**	**54.6**	**38.9**	**0**
% of facilities with stock out of AL for 7 or more consecutive days in past 3 months					
All AL packs	**27.2**	**21.0**	**6.3**	**9.4**	**0**
AL 6 pack	**37.6**	**30.1**	**19.5**	**21.1**	**0**
AL 12 pack	**43.9**	**32.4**	**31.6**	**28.7**	**0**
AL 18 pack	**52.0**	**42.1**	**27.6**	**29.8**	**0**
AL 24 pack	**39.3**	**35.2**	**19.5**	**19.9**	**0**
Any AL pack	**59.5**	**52.3**	**44.8**	**39.0**	**0**
% of facilities with stock out of recommended antimalarials for 7 or more consecutive days in past 3 months					
Quinine tablets	**25.4**	**22.2**	**16.1**	**15.1**	**0**
Quinine injections	**20.8**	**20.5**	**17.2**	**20.9**	**0**
% of facilities without any malaria diagnostic support (RDT or microscopy) for 7 or more consecutive days in past 3 months	**46.6**	**42.1**	**40.8**	**32.0**	**0**
% of facilities having national malaria case-management guideline	**0**	**5.7**	**47.7**	**45.3**	**100**
% of HWs trained on new malaria case-management policy	**0**	**21.5**	**24.9**	**27.7**	**100**
% of HWs who had at least one supervisory visit in past 3 months that included observation of malaria case-management	**6.7**	**6.8**	**11.2**	**11.4**	**100**
% of facilities which had at least one visit in past 3 months that included quality control of malaria microscopy[a]	**9.1**	**18.1**	**17.0**	**22.8**	**100**
% of facilities which had at least one visit in past 3 months that included use of malaria RDTs[a]	**5.3**	**6.7**	**20.8**	**20.7**	**100**

[a] The indicator includes only facilities which provide these services on survey days

Annex 2: Summary of key malaria case-management M&E indicators

Malaria case-management M&E indicators	2010 Rd 1	2010 Rd2	2011 Rd 3	2012 Rd 4	Target 2013
Indicators showing overall performance of the new case-management policy - all facilities regardless the availability of the commodities					
% of febrile patients who are managed according to national guidelines (tested for malaria AND only positive test results are treated with AL)	**15.7** ($11.8_{<5}$,$18.9_{\geq5}$)	**22.1** ($18.7_{<5}$,$25.0_{\geq5}$)	**25.1** ($21.5_{<5}$,$27.9_{\geq5}$)	**28.4** ($23.6_{<5}$,$32.3_{\geq5}$)	**100**
% of febrile patients who are tested with RDT or microscopy	**23.9** ($20.5_{<5}$,$26.7_{\geq5}$)	**30.9** ($25.6_{<5}$,$35.5_{\geq5}$)	**36.8** ($31.0_{<5}$,$41.5_{\geq5}$)	**37.4** ($31.5_{<5}$,$42.3_{\geq5}$)	**100**
% of febrile patients with positive test result who are treated with AL	**82.7** ($74.8_{<5}$,$86.7_{\geq5}$)	**89.2** ($90.9_{<5}$,$88.2_{\geq5}$)	**69.8** ($70.3_{<5}$,$69.5_{\geq5}$)	**85.9** ($84.1_{<5}$,$86.9_{\geq5}$)	**100**
% of febrile patients with negative test result who are not treated for malaria	**47.9** ($43.3_{<5}$,$51.3_{\geq5}$)	**55.5** ($58.3_{<5}$,$53.5_{\geq5}$)	**69.8** ($68.7_{<5}$,$70.6_{\geq5}$)	**69.2** ($69.3_{<5}$,$69.1_{\geq5}$)	**100**
Indicators showing health workers adherence to guidelines – facilities where malaria diagnostics and AL are available					
% of febrile patients who are managed in accordance with national guidelines (tested for malaria AND only positive test results treated with AL)	**28.1** ($19.3_{<5}$,$36.1_{\geq5}$)	**34.6** ($29.0_{<5}$,$41.7_{\geq5}$)	**40.2** ($32.6_{<5}$,$47.2_{\geq5}$)	**44.3** ($37.9_{<5}$,$49.3_{\geq5}$)	**100**
% of febrile patients who are tested with RDT or microscopy	**42.5** ($33.3_{<5}$,$50.8_{\geq5}$)	**49.5** ($38.8_{<5}$,$59.6_{\geq5}$)	**56.9** ($46.8_{<5}$,$66.4_{\geq5}$)	**57.8** ($50.6_{<5}$,$63.6_{\geq5}$)	**100**
% of febrile patients with positive test result who are treated with AL	**83.3** ($75.3_{<5}87.4_{\geq5}$)	**89.6** ($91.8_{<5}$,$88.3_{\geq5}$)	**75.3** ($71.9_{<5}$,$77.3_{\geq5}$)	**88.6** ($85.5_{<5}$,$90.3_{\geq5}$)	**100**
% of febrile patients with negative test result who are not treated for malaria	**47.2** ($42.3_{<5}$,$50.7_{\geq5}$)	**56.0** ($61.1_{<5}$,$52.6_{\geq5}$)	**69.8** ($67.1_{<5}$,$71.7_{\geq5}$)	**68.8** ($69.1_{<5}$,$68.6_{\geq5}$)	**100**
Indicators showing quality of AL prescribing, dispensing and counseling – febrile patients with AL prescribed and dispensed					
% of patients with AL prescribed in recommended weight-specific dose	**89.2** ($88.7_{<5}$,$89.6_{\geq5}$)	**92.4** ($93.8_{<5}$,$91.3_{\geq5}$)	**92.8** ($93.4_{<5}$,$92.3_{\geq5}$)	**97.7** ($99.1_{<5}$,$96.7_{\geq5}$)	**100**
% of patients with AL dispensed who had weight measured	**51.8** ($60.0_{<5}$,$45.1_{\geq5}$)	**53.6** ($71.4_{<5}$,$39.4_{\geq5}$)	**52.5** ($57.3_{<5}$,$50.8_{\geq5}$)	**51.7** ($58.6_{<5}$,$46.9_{\geq5}$)	**100**
% of patients with AL dispensed who had first dose given at facility	**32.1** ($35.7_{<5}$,$29.2_{\geq5}$)	**26.9** ($29.3_{<5}$,$24.9_{\geq5}$)	**37.5** ($31.0_{<5}$,$42.2_{\geq5}$)	**41.7** ($42.7_{<5}$,$41.0_{\geq5}$)	**100**
% of patients with AL dispensed who were explained on dosing at home	**96.2** ($96.2_{<5}$,$96.1_{\geq5}$)	**92.9** ($92.4_{<5}$,$93.2_{\geq5}$)	**94.4** ($93.2_{<5}$,$95.3_{\geq5}$)	**94.6** ($95.0_{<5}$,$94.4_{\geq5}$)	**100**
% of patients with AL dispensed who were advised what to do if vomiting occurs	**6.3** ($7.8_{<5}$,$5.0_{\geq5}$)	**5.9** ($6.5_{<5}$,$5.4_{\geq5}$)	**4.6** ($5.0_{<5}$,$4.4_{\geq5}$)	**6.4** ($7.5_{<5}$,$5.6_{\geq5}$)	**100**

Annex 3: AL monitoring data – time trends in the availability of non-expired AL

% facilities with AL in stock		Jan[a]	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Any AL pack	2010	94.3		89.9	81.6	79.9	91.5	95.8	86.6	82.3	89.7	95.7	97.2
	2011	89.9	83.5	87.7	89.4	85.0	87.0	89.1	79.6	90.5	85.7	96.9	90.1
	2012	87.3	84.9										
AL 6 pack	2010	81.0		72.0	60.7	64.0	89.0	90.9	84.2	78.1	87.8	87.8	89.2
	2011	78.1	78.2	84.1	83.3	80.2	80.3	78.2	69.1	77.1	74.5	82.5	79.5
	2012	82.3	78.8										
AL 12 pack	2010	79.9		71.4	52.4	54.9	79.3	85.5	74.4	67.7	79.4	84.8	86.4
	2011	80.0	72.9	79.4	69.7	67.7	69.1	59.8	61.1	70.1	72.7	80.6	82.0
	2012	74.7	78.8										
AL 18 pack	2010	79.3		70.8	60.7	57.3	80.5	81.2	72.0	65.2	72.7	81.1	81.8
	2011	76.3	70.0	74.7	74.2	71.3	74.7	66.7	65.4	76.4	73.9	81.3	77.6
	2012	75.3	74.6										
AL 24 pack	2010	86.2		80.4	73.2	72.6	78.1	81.2	71.3	67.7	78.8	86.0	86.9
	2011	77.6	72.9	77.7	78.8	72.5	74.1	73.6	68.5	80.3	77.6	80.6	80.8
	2012	76.0	77.6										
All AL packs	2010	64.9		51.2	41.1	46.3	67.1	67.3	59.2	55.5	64.2	66.5	71.6
	2011	63.3	59.4	65.9	57.6	61.7	62.4	45.4	49.4	58.6	59.0	60.6	65.2
	2012	63.3	69.1										

[a] Data in 2010 collected from 18 January – 12 February