



# Universal Diagnosis and Treatment to Improve Maternal and Child Health

**Project Year 2 Annual Report**  
November 15, 2014

PRESIDENT'S MALARIA INITIATIVE



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**MalariaCare**  
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**Save the Children**

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## Acronyms

ACT	artemisinin-based combination therapy
AIDS	acquired immune deficiency syndrome
CBA	community based agent
CCoP	communications community of practice
CHO	community health officer
DHIS	district health information system
DHS	demographic and health survey
DRC	Democratic Republic of Congo
ECAMM	external competency assessment of malaria microscopy
EPI	Ethiopian Public Health Institute
ESMPIN	Expanded Social Marketing Project in Nigeria
GHS	Ghana Health Service
HF	health facility
HIV	human immune deficiency virus
HMIS	health management information system
HIO	health information officer
iCCM	integrated community case management
ICD	Institutional Care Division
INRB	Institut National de Recherches Biomédicales (national reference laboratory, DRC)
IRB	institutional review board
M&E	monitoring and evaluation
MCDMCH	Ministry of Community Development/Maternal and Child Health (Zambia)
MDRT	malaria diagnostics refresher training
MERG	Roll Back Malaria Monitoring and Evaluation Reference Group
MOH	Ministry of Health
MOHSW	Ministry of Health and Social Welfare (Liberia)
NAMS	national archive of malaria slides
NMCP	National Malaria Control Program
OTSS	outreach training and support supervision
PCR	polymerase-chain reaction
PMI	United States President's Malaria Initiative
PMI-EP	United States President's Malaria Initiative Expansion Project (DRC)
PMP	performance monitoring plan
PPME	Policy, Planning, Monitoring and Evaluation division (Ghana Health Service)
PPMV	patent and proprietary medical vendors
PSI	Population Services International
PY	project year
QA	quality assurance
RBM	Roll Back Malaria
RDT	rapid diagnostic test
SOP	standard operating procedures
TB	tuberculosis
TOT	training of trainers
UK NEQAS	United Kingdom National External Quality Assessment Service
USAID	US Agency for International Development
WHO	World Health Organization

## Executive summary

MalariaCare, a five-year partnership led by PATH and funded by the United States Agency for International Development (USAID) under the United States President's Malaria Initiative (PMI), aims to scale up high-quality diagnosis and treatment for malaria and other life-threatening illnesses. The annual performance monitoring report describes accomplishments toward achieving MalariaCare's objectives, intermediate results, and milestones during project year two (PY2), from October 1, 2013, through September 30, 2014.

During PY2, MalariaCare continued activities to improve malaria diagnosis and treatment in eight countries, began planning for and implementing new activities in four new countries, and strengthened the technical quality of global malaria case management policies and programs. The project has worked to increase coverage of high-quality malaria diagnosis and treatment through training; quality assurance (QA) strategies including supportive supervision and capacity-building with national and regional governments. In Malawi, the number of facilities with the capacity to conduct rapid diagnostic tests (RDTs) increased to 98% of the 500 targeted facilities. By the end of PY2, all supported facilities had one or more providers trained in how to administer RDTs. In Ghana, supervisor competency in microscopy and RDTs increased from 57.55% to 91.5% pre- and post-test results respectively, during project supported diagnostic training. This training also prepared the supervisors to facilitate regional-level malaria diagnostic refresher training (MDRT) for routine laboratory staff as well as provide support through outreach training and support supervision (OTSS).

In addition to country level activities, MalariaCare contributed to revisions of global standards for microscopy, case management, and QA for malaria programs. In Zambia, MalariaCare developed a curriculum for a national-level microscopist accreditation program. The curriculum was used to train 20 participants in Zambia and will continue to be rolled out to other MalariaCare countries. The project also finalized a more streamlined and improved checklist to assess the outcomes of OTSS activities that is now being finalized for use in rollout of an electronic information platform in four countries. MalariaCare staff also participated in a review of health facility indicators and their relationship to OTSS data, in an effort to gather nationally and globally comparable health facility information. The project hosted well-attended webinars on engaging the private sector in malaria case management and on community case management. To support MalariaCare's expanding portfolio, several new country and HQ level staff have joined the project team.

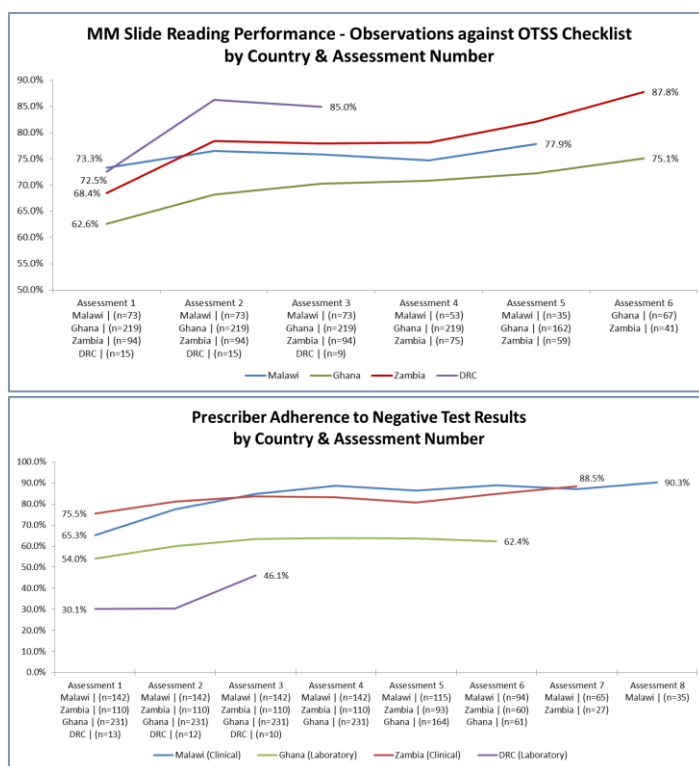
This year, MalariaCare helped establish protocols for the development of National Archives of Malaria Slides (NAMS) in Malawi, Zambia, and the DRC. In addition to development of NAMS protocols, slide creation was started in Ghana and Ethiopia where NAMS is now nearly complete. The project continued to expand efforts to develop national diagnostic and QA guidelines in Malawi and Mozambique, national laboratory guidelines in Liberia, and revisions to pre-service training curricula for case management in Zambia and Ghana. MalariaCare has supported, and will continue to support, the implementation of these policies and guidelines at local levels through training of trainers, enhanced OTSS that emphasizes QA, and mentorship, supporting local microscopists to become accredited by the World Health Organization (WHO) and integrating electronic reporting systems with existing national reporting systems to facilitate evidence-based decision-making.

To work toward improving the accuracy of diagnostic testing through assessing and strengthening QA systems for malaria microscopy and RDTs, MalariaCare's primary QA activity in PY2 has been OTSS to laboratories and health facilities. MalariaCare tracks achievements in quality case management by collecting data on the correct classification of those patients that need a malaria diagnostic test, the performance of diagnostic test and clinician adherence to diagnostic test results.

## Global indicators

OTSS occurred in 3,874 facilities globally, leading to on-site mentoring for approximately one to two staff per facility. In addition to OTSS, MalariaCare trained 373 laboratory staff in malaria diagnostic refresher training, trained 1,328 providers in case management, and provided support to 385 staff in data QA training, including additional OTSS visits tied to data QA. In addition to clinical activities, MalariaCare supported 11 regional and district-level lessons learned workshops to review data with supervisors and discuss steps toward improving key indicators in diagnosis and treatment. In Ghana, MalariaCare was also able to work with regional and district health management teams to plan and execute QA activities for malaria. Analysis of these activities, shown in each country achievement section, shows that MalariaCare activities resulted in improvements in malaria microscopy, RDT performance, and adherence to the diagnostic test result for malaria.

Individual country achievement sections include further detail on progress in PY2; however, some trends are worth noting across several of MalariaCare’s countries. An analysis of slide reading performance and provider adherence to negative test results, shows promising trends following successive OTSS visits to the same set of health facilities. The figures below show that, following 5-6 OTSS visits, providers in a sub-set of countries were able to better conduct slide reading and adhere to negative test results. These results were tracked from the same facility over variable time periods so that we can assess the impact that multiple OTSS visits that may not happen during successive OTSS rounds.



*In most project-supported countries, OTSS rounds occur on a quarterly basis; however, not every health facility is targeted in each OTSS round. Therefore, the country reports represent different OTSS rounds but show progress made after facilities receive successive OTSS visits (assessment number). In the DRC, fewer health facilities were visited over successive rounds. Thus, continued OTSS will provide a larger sample of health facilities for analysis in the DRC.*

These gains are important indications that OTSS is helping to enable more accurate diagnosis and appropriate treatment of malaria. Building on PY2 achievements, MalariaCare will continue to support partner countries in their efforts to provide high quality diagnosis and treatment services.

## Background

MalariaCare, a five-year partnership led by PATH and funded by the United States Agency for International Development (USAID) under the United States President's Malaria Initiative (PMI), aims to scale up high-quality case management services, both diagnosis and treatment, for malaria and other febrile illnesses. The partnership works in PMI focus countries and other countries in Africa to reduce the burden of serious disease and promote healthy communities and families. MalariaCare started on September 30, 2012, and will end on September 29, 2017.

The MalariaCare team aims to achieve the following objectives:

- Improve the accuracy of diagnostic testing in the health sector.
- Increase the percentage of suspected malaria patients who receive a diagnostic test for malaria.
- Increase the percentage of patients who receive appropriate treatment for malaria or other febrile illness, consistent with test results.
- Strengthen health systems at the country level for the diagnosis and treatment of malaria and other infectious diseases, with a focus on laboratory support.

## MalariaCare partners

MalariaCare is led by PATH and supported by three other organizations: Medical Care Development International, Population Services International (PSI), and Save the Children. Each partner has extensive experience in designing and implementing malaria control programs in high-burden countries. The MalariaCare team's expertise includes laboratory strengthening, malaria diagnosis and treatment, program evaluation and research, and community-based management of disease in both the public and private sectors.

## Introduction

This annual performance monitoring report describes accomplishments toward achieving MalariaCare's objectives, intermediate results, and milestones during project year (PY) 2, from October 1, 2013, through September 30, 2014. The report also describes challenges faced by the MalariaCare team and next steps. The report is organized by global and country achievements. Appendix A provides MalariaCare's performance monitoring plans (PMP), reporting on progress toward reaching specific targets.

The global achievements section describes progress toward reaching the project's PY2 core work plan objectives. Global work plan areas are:

- Project operations
- Monitoring and evaluation (M&E)
- Advocacy and communications
- Technical leadership

The country achievements section summarizes MalariaCare's activities and progress toward improving diagnosis and treatment of malaria and other illnesses in the 12 countries listed below. Accomplishments are described by each project objective.

- Cambodia
- Democratic Republic of Congo (DRC)
- Ethiopia
- Ghana
- Guinea
- Liberia
- Madagascar
- Malawi
- Mozambique
- Nigeria
- Tanzania
- Zambia



# Global achievements

## Project operations

During PY2, the MalariaCare operations team improved oversight of implementation and management of project activities through the creation of a field operations team. The team continued to maintain frequent partner communication and interaction through advisory group meetings, and recruited additional staff to support the project’s growing portfolio.

### Key accomplishments

- Restructured the project staffing and created a field operations team to provide more effective and efficient management and coordination support to field teams and activities.
- Conducted successful introductory planning trips to MalariaCare’s three new program countries: Tanzania, Mozambique, and Madagascar.
- Ensured consistent communications between MalariaCare and the PMI headquarters team by conducting biweekly telephone and face-to-face meetings.
- Conducted nine technical advisory group meetings to develop technical strategies to revise the project’s quality assurance (QA) strategy, refine supervision checklists, and discuss and summarize working group meetings attended by members of the advisory group. The group includes members from all four partners.
- Held two partner meetings, one with technical personnel to review and revise MalariaCare’s outreach training and support supervision (OTSS) checklists, and the second to review progress and challenges in PY2 and plan activities for PY3.
- Conducted two operations advisory group meetings with representation from all partners. The group met to review country-level operations and establish and communicate processes. In the second half of PY2, country-specific operational issues and needs were discussed informally as needed between the relevant partners.
- Improved project capacity to comply with donor requirements by supporting two global staff to participate in USAID rules and regulations training.
- Developed and instituted new processes and templates to monitor progress on project activities and collect updates on workshops and training events to improve activity tracking and output monitoring.

Table 1. Country staff and backstops as of September 30, 2014.

Country	Country lead	Backstop
Cambodia	Abigail Pratt	Troy Martin
Democratic Republic of Congo	S�raphine Kutumbakana	Troy Martin
Ethiopia	N/A	Nicole Whitehurst/Kerk Allen
Ghana	Raph Ntumy	Julie Parks
Guinea	N/A	Matt Worges
Liberia	Rachael Watson	Luis Benavente
Madagascar	Lucy Raharimalala	Jamie Eliades/Alexandra Alberto
Malawi	Petros Chirambo	Holly Greb
Mozambique	TBD	Fozo Alombah
Nigeria	Kachi Amajor	Molly Robertson
Tanzania	TBD	Troy Martin/Julie Parks
Zambia	Timothy Nzangwa	Holly Greb

Note: TBD = to be determined; N/A = not applicable.

## Challenges

As stated in the semiannual report, in-country operations require enhanced support from MalariaCare, both to respond to logistical needs and to ensure that adequate risk management measures are in place. The team has restructured the global team by creating a field operations team. Additional positions have also been created to allow this team to focus on providing improved oversight and coordination support to in-country teams, and facilitate cross-fertilization between countries. In countries where increasing scopes require stronger in-country capacity, MalariaCare will recruit additional staff to support the program.

## Next steps

MalariaCare will continue to focus on effectively managing project operations across all supported countries. In PY3, operations activities will include establishing field offices where needed and not already present, expanding in-country staffing, and embedding field operations procedures within existing and new project offices. The operations team will also focus on continuing to build in-country capacity for operations and compliance.

## Monitoring and evaluation

### Introduction

M&E work supports the design and implementation of project strategies and activities that support PMI objectives, ensures that performance indicators used by the project align with PMI and the Roll Back Malaria (RBM) Partnership indicators, and allows project management to continually review project performance and contribution to global efforts to scale up improved case management of malaria and other febrile illnesses. During the first half of PY2, MalariaCare reviewed lessons learned from in-country OTSS and continues to analyze this information with the aim of improving M&E practices across the portfolio and developing a broader QA strategy. This included streamlining the current OTSS checklist to direct supervisor focus to specific challenges associated with health worker tasks, and is expected to enable supervisors to refine their mentorship skills. During the second half of the year, MalariaCare piloted the checklist in Malawi using tablets. The aim of the pilot was to help refine the checklist and understand the usability and acceptability of tablets to improve turnaround time of data that is then available for decision-making. Moving data collection and analysis to electronic systems should allow data to be analyzed at all levels, ensuring a team approach to making programmatic adjustments based on routine data.



A health information officer visits a peripheral health facility in Ghana to mentor staff on proper data recording. Photo credit: PATH/Molly Robertson

## **Key accomplishments**

- The MalariaCare OTSS checklist was refined and specific sub-tasks were identified to allow for a more fine-grained analysis for decision-making.
- Composite competence indicators, for example for microscopy slide preparation, were refined to allow for a more precise understanding of performance challenges. Previously, these indicators consisted of tasks that were given a summary score (e.g., 5 points for completing all tasks of microscopy slide preparation). This allowed for little precision in determining exactly what steps were most challenging. These tasks will now be scored individually (rather than summary scores) to allow for more precise analysis.
- Electronic data collection was piloted and the report from this pilot was used to make modifications to the OTSS checklist and supervision guidance. The use of tablets and the refined checklist was well-received by Malawi supervisors. Supervisors who had not previously used a pilot or touch screen were able to manipulate the tablet with ease after just a few hours. In addition, information gathered from the pilot supervision was immediately available for the subsequent lessons learned workshop. Supervisors were able to see broad performance challenges and develop action plans to address those challenges.

## **Challenges**

Timely data collection and the availability of data for programmatic decision-making have been challenges for MalariaCare. To address these, MalariaCare has begun development of a tablet-based data collection system that will link with existing country health management information systems (HMIS). This is expected to improve the timeliness of data collection and facilitate improved decision-making.

MalariaCare has been working with the Roll Back Malaria's Monitoring and Evaluation Reference Group (MERG) to ensure that comparable indicators are being used between health facility surveys and OTSS. This is expected to improve accessibility to and timeliness of information for decision-making. However, health facility evaluation indicators developed by USAID and those being developed by the World Health Organization (WHO) are still under discussion within the MERG. PMI and WHO expect to provide guidance on unified indicators by the end of the calendar year.

Capacity-building in country on the utilization of national data, such as HMIS, malaria indicator survey, and the demographic and health survey data, to inform planning and decision-making remains challenging. In PY3, MalariaCare will develop guidance on how to include this information for decision-making in countries where opportunities exist to contribute to planning and decision-making at the national level.

## **Next steps**

In PY3, the principal M&E task will be developing a robust, timely, and accurate system for gathering facility-level and competence data, including provider abilities to perform microscopy, administer rapid diagnostic test (RDTs), and make treatment decisions based on the result of diagnostic information. In selected countries, this will entail moving to a tablet-based DHIS2 platform for data gathering. In countries where MalariaCare is not planning to implement tablet-based systems, the project will support development of web-based data entry platforms to enhance dissemination and visualization of OTSS data. MalariaCare will adopt best practices to teach data use for decision-making and begin incorporating these practices into lessons learned workshops, supervisor training, and other forums such as regional and district planning meetings, to encourage evidence-based decision-making. MalariaCare will continue to work closely with health facility staff to enhance data harmonization and use.

## Advocacy and communications

MalariaCare’s advocacy and communications activities aim to influence policy at the national and global levels, increase access to technical and programmatic information, and support USAID communication with missions and governments about MalariaCare. During PY2, the project advanced global discussions on malaria case management and disseminated helpful information and tools to PMI staff, local service providers, and other global health colleagues to improve malaria diagnosis and treatment programs.

### Key accomplishments

- Conducted two well-attended webinars, including a webinar focused on engaging private health care providers in malaria case management and a second focused on community case management of malaria. Around 100 colleagues from 20 countries joined each discussion. Panelists joined us from Ethiopia, Kenya, Malawi, Nigeria, the United States, WHO headquarters in Geneva, and PMI headquarters in Washington.
- All of MalariaCare’s webinars have been archived for viewing from our website resources page: [www.malariacare.org/resources\\_](http://www.malariacare.org/resources_)
- Published a program brief titled: *Effectively engaging the private sector to improve malaria case management*. A program brief linked to the “community case management” webinar is in production and will be published in PY3.
- Developed a series of six country fact sheets to share with USAID missions, country partners, and other global health colleagues. Each two-page fact sheet describes how MalariaCare is collaborating with country partners to strengthen diagnosis and treatment of malaria and other life-threatening illnesses.
- E-published a paper titled: *Barriers to expanded malaria diagnosis and treatment—A focus on barriers which may be addressed through advocacy, communication, and training interventions*. The paper was featured during a meeting of the Roll Back Malaria Communication Community of Practice (RBM CCoP) in Geneva, and is available on the MalariaCare website.
- Provided leadership to the Malaria Interventions Task Force of the RBM CCoP, encouraging the group to focus resources on expansion of the “test and treat” model.
- Maintained, updated, and expanded the MalariaCare website.
- Promoted the webinars, program brief, and fact sheets through a series of MalariaCare e-bulletins.



Visits to the MalariaCare website ([www.malariacare.org](http://www.malariacare.org)) in PY2 nearly doubled from the previous year, averaging 821 unique visits per month. Visits peak whenever MalariaCare e-Bulletins go out, and especially before and after webinars.

### Challenges

No significant challenges to report.

### Next steps

In PY3, the team will organize additional webinars, add fact sheets to the series as work plans are approved for each new country, document success stories from the field, maintain and expand the website, and continue to broadcast e-bulletins. We also will continue our work with partners in the RBM CCoP Malaria Interventions Working Group to foster broader understanding and advocate for expanded uptake of the “test and treat” approach.

## Technical leadership

MalariaCare's technical leadership activities aim to improve care of the febrile patient, with a primary concentration on malaria and other life-threatening illnesses such as pneumonia, diarrhea, and sepsis. The focus of core technical activities during PY2 was on improving field activities, sharing technical lessons and approaches across project-supported countries, and contributing to global technical consultations. The accomplishments described below ensure that the project's strategies and activities are based on the latest evidence and best practices, and that they strengthen the technical quality of global malaria case management policies and programs.

### Key accomplishments

- Developed a curriculum for a national-level microscopist accreditation program. The curriculum was used to train 20 participants in Zambia and will continue to be rolled out to other MalariaCare countries.
- Expanded capacity on the technical team with the addition of a senior advisor for clinical care to support global- and country-level efforts to improve case management.
- Through MalariaCare membership on WHO's Technical Expert Group Meeting on Artemisinin Resistance and Containment, contributed recommendations to WHO's Malaria Policy Action Committee regarding the artemisinin resistance situation in Southeast Asia.
- Developed a more streamlined and improved checklist for OTSS activities that is now being finalized by the M&E team and PSI for use in rollout of an electronic information platform in four countries.
- Initiated development of a malaria and febrile case management curriculum to support enhanced mentoring during supervisory visits. The curriculum is being designed to incorporate multiple mentoring strategies that will be available to the supervisors, including didactic sections, case scenarios, role-play, and video. The curriculum will be rolled out with the first electronic data collection platform in Malawi.
- Developed a peer-to-peer mentoring strategy that will be rolled out in several focus countries in PY3. Given the focus on providing on-the-job mentorship, staff from high-performing facilities will visit those from low-performing facilities to provide one-on-one support in the mentee's actual work setting. Through this mechanism, we hope to encourage local decision-making and a low cost model that could continue to be implemented by district health management teams when the project ends.

### Challenges

No significant challenges to report.

### Next steps

In PY3, the technical team will work with the M&E and operational teams to develop an electronic information platform to fully execute the improved QA strategy. As discussed under the M&E section, components of the improved QA strategy include updated checklists, OTSS mentoring curriculum, mentoring activities beyond OTSS, and the development of a more participatory and solutions-driven format for lessons learned workshops using data and feedback from these other mechanisms. MalariaCare will continue to expand efforts to provide both global malaria case management leadership, as well as provide technical assistance to PMI focus countries and other countries as requested to apply these global standards for improved facility- and community-level case management. The team will continue to consolidate and refine technical assistance documents and strategies that have national and global reach—including work on policies and guidelines for case management QA, and algorithms and guidelines for management of fever. Team members will also continue to participate in key global dialogues such as the RBM and WHO technical working groups for case management, malaria diagnostics QA, and artemisinin resistance and containment.

# Country achievements

## Cambodia

MalariaCare serves as a pass-through mechanism for PSI Cambodia to install QA systems to improve malaria case management services in the private sector and to upgrade the management information system. The aim of this work is to improve the quality of febrile case management in the Cambodian private sector, through which approximately 480,000 RDTs and 83,000 artemisinin-based combination therapy (ACT) doses flow annually.



Photo credit: PSI/Christopher James White

### Key accomplishments

- Complete in-country project team hired and trained.
- QA systems and protocols were designed to ensure that patients receive the highest possible level of care from a provider. The simultaneous development of a tailored DHIS2 data warehousing system has allowed all of the QA programming to be examined alongside monthly caseload data coming in from the project-supported network of private providers.
- A clear training curriculum for the QA team was created including modules on (a) the correct use of the tablet; (b) data upload and data extraction from the system; (c) interpersonal skills to conduct an effective QA assessment including probing skills without prompting for the answers; and (d) the ability to walk the provider through a simulated malaria case scenario. The rollout of this upgraded system has improved both coordination and data-sharing with the Ministry of Health (MOH) operating centrally, and at the operational district levels.
- Using set protocols and standard operating procedures (SOPs), the team followed a set schedule of visits to reach public and private providers at plantation clinics over the program catchment area, which currently covers eight provinces. Between May 5 and September 30, 2014, 410 providers were successfully assessed—representing 100% of the total target (n=410).
- Given the importance of diagnosing and treating malaria accurately, the scoring system is rigorous; achieving a Class A score requires excellent responses on most questions. According to the assessments completed this fiscal year, 30% of the providers scored more than 80%, thus classifying them as Class A, or Good; 56% achieved 50%–79% corresponding to Fair; and 13% scored less than 50%, ranking them as Poor or a Class C provider (see Figure 1). Using these scores, the follow-up supervision dates were generated with follow-up visits to Class B and Class A providers 3 months and 6 months from the initial assessment respectively. Class C providers are visited within the same month of the initial assessment and providers who see a high volume of patients are prioritized. This system means that there is a solid and objective evidence base that ranks each provider, which also can be used to plan follow-up supervision visits.
- Developed a prototype dashboard for the DHIS2. This activity will allow senior management in the National Malaria Control Program (NMCP) to review and use case management data from the private sector for the first time. The new dashboard was presented to the Cambodia NMCP in late October 2014. MalariaCare will continue to work intensively with the NMCP to ensure they can access and search the system directly. Figures 1–4 represent a sample of the graphs available and give a sense of how the information can be used.

Figure 1. Provider quality of care classifications.

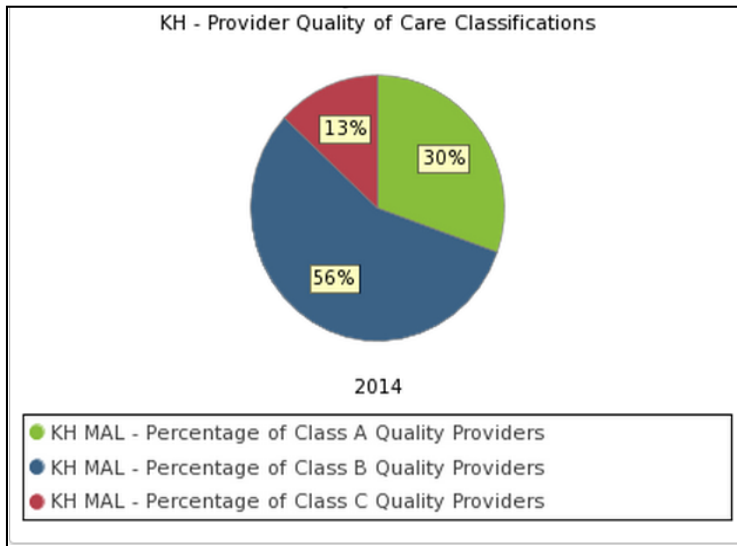


Figure 2. Performance monitoring.

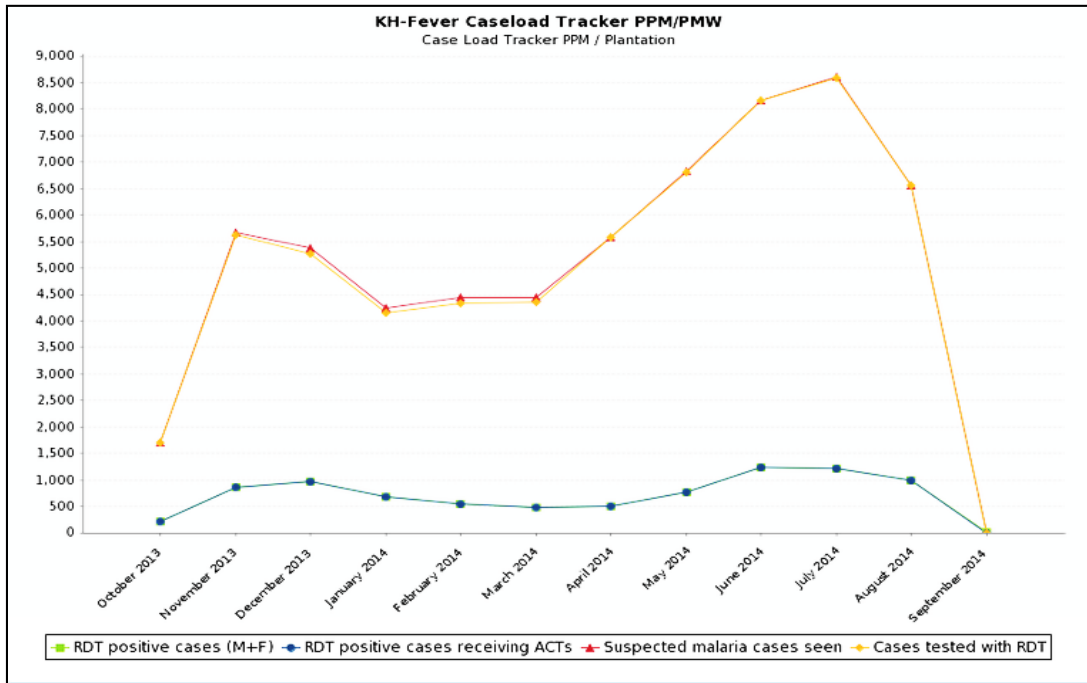


Figure 2 highlights the relationship between the number of suspected cases of malaria seen, cases tested by RDT, the number of positive cases (male and female), and the number of positive cases treated with an ACT. The rate of testing has steadily increased over the year. The treatment line representing positive cases and the line showing cases treated with an ACT merge into a single line, again indicating the desired behavior. This data provides the ratio of RDT to ACT reportedly utilized, which also assists in forecasting for procurement purposes.

Figure 3. National malaria epidemiology.

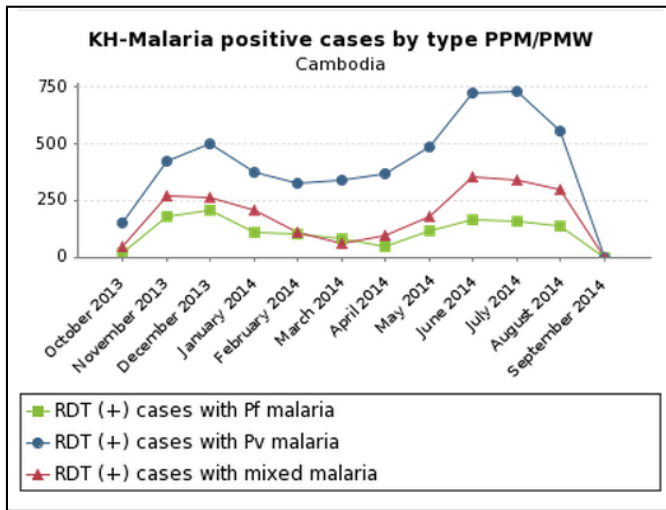
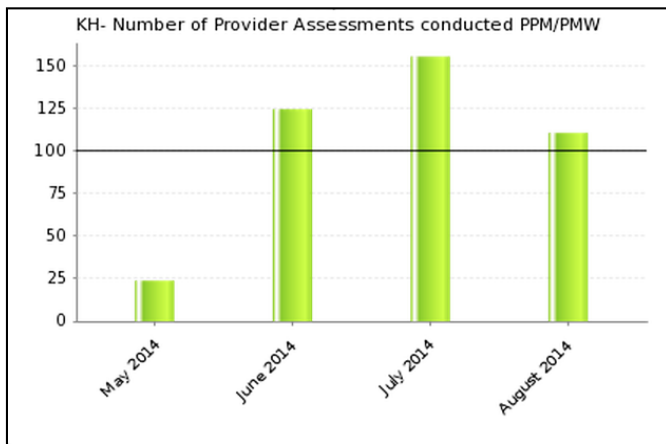


Figure 3 is an essential piece of information for the National Elimination Program as it breaks down the different types of malaria being seen by the private providers and at the plantations. According to this data, there is a greater incidence of *P. vivax* among those seeking treatment. Not only does this data point serve as an indicator of the success of the elimination program, it also informs drug procurement decisions.

Figure 4. Donor indicators and deliverables.



\*100 assessments is the monthly target for provider visits

Figure 4 is an example of how DHIS2 can be used to assist the program management team to determine whether *complete* data is being reported *routinely*, in this case, every month. This is useful from a program management perspective and is frequently a donor indicator as well.



## Challenges

In some areas, there is no network coverage, which is needed for transmission of checklist data to the database. To address this, an offline PDF version of the checklist was developed in order for QA officers to complete the template when coverage is scarce and to avoid duplicative activities (paper to tablet entry). In addition, MalariaCare's work builds on previous work supported by Global Fund to Fight AIDS, Tuberculosis and Malaria public-private mix programs and operational research programs supported by the Bill & Melinda Gates Foundation. MalariaCare has continued to strengthen coordination with implementing partners and the national program. The project engages in open dialogue with all donors and partners in order to clarify needs and find efficient ways of streamlining them.

## Next steps

The switch from a network of traditional Microsoft Access databases, which previously housed the malaria data, to the DHIS2 system has demonstrated the power and capacity of a new generation of web-based data management systems. As noted by the Independent Malaria Program Review (2012):

“A lot of energy is put into the collection of data but there is very little evidence that the data is being used except for annual reports or for reporting... This needs to change to focus more on the analysis of the data as a basis for action. It also needs to transition into becoming the key component of the national elimination strategy.”

As with every data reporting system, the project will continue to ensure that the platform is consistently updated. The project team believes that this system will be instrumental for central management and the provincial health departments in identifying hot spots, hot populations, and areas that require urgent action, while simultaneously setting an example for the rollout of DHIS2 regionally.

## Democratic Republic of Congo

MalariaCare supports the NMCP in the DRC to expand and improve the quality of diagnostic testing through training, establish strong QA measures, and provide regular supportive supervision. The project also strengthens treatment of malaria and febrile illness through training and supervision of health providers. In PY2, the project focused on further operationalizing a system for malaria diagnostics QA within the five targeted provincial reference laboratories and at health-zone-level health facilities. The project also focused on improving the tools used for on-site supervision and continued to perform individual supervision visits while expanding to new health facilities. Additionally, the project collaborated with its in-country partners to expand supervision activities to encompass febrile case management practices and worked to set in place national guidelines for QA of malaria diagnostics.

## Key accomplishments

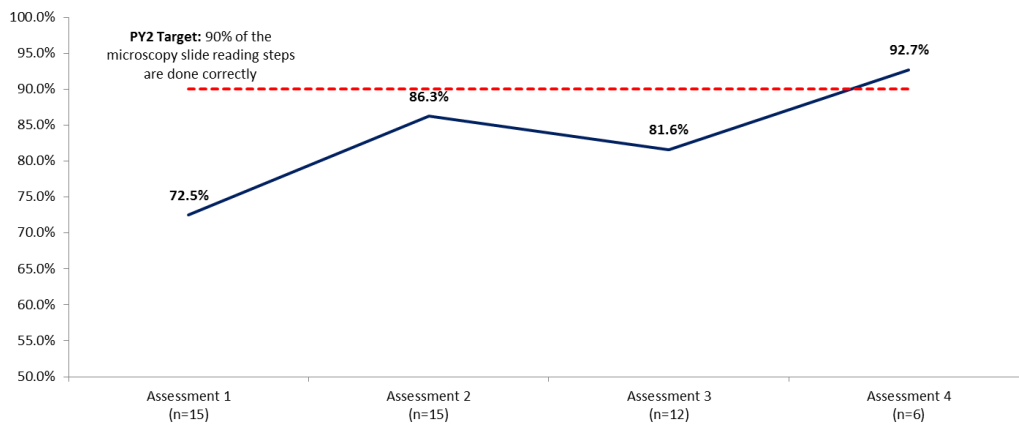
*Objective 1: The accuracy of diagnostic testing for malaria is improved to greater than 90%.*

- To prepare a core group of national- and provincial-level microscopy trainers, MalariaCare held an advanced malaria diagnostics refresher training (MDRT) course for 19 laboratory technicians; 14 participants achieved passing scores for sensitivity ( $\geq 90\%$ ), specificity ( $\geq 90\%$ ), and parasite counting ( $\geq 50\%$ ). Despite these achievements, overall individual performance still requires improvement, particularly in the area of parasite species identification.
- Revised the OTSS checklist through a joint evaluation by MalariaCare, the United States President's Malaria Initiative Expansion Project (PMI-EP), and the NMCP. It is currently in use for on-site health

facility visits during laboratory OTSS in both the MalariaCare project (primarily at the provincial level) and in the PMI-EP (at the health zone level).

- Completed laboratory OTSS through round 5, including site visits to 15 facilities—provincial reference laboratories, provincial and general reference hospitals, and health facilities. During these visits, supervisors provided refresher mentoring, reviewed laboratory worker microscopy and RDT skills, and distributed bench aids. In addition, supplemental light sources were procured and delivered to laboratory OTSS facilities. Seventy health workers were trained on malaria microscopy and/or malaria RDTs during PY2 OTSS visits.
- Aggregate scores for microscopy and RDT performance have continued to improve in PY2. Figure 5 shows a steady improvement in microscopy slide reading performance when compared to a 90% target compliance with a checklist, with health facilities obtaining this goal on average after four OTSS visits.

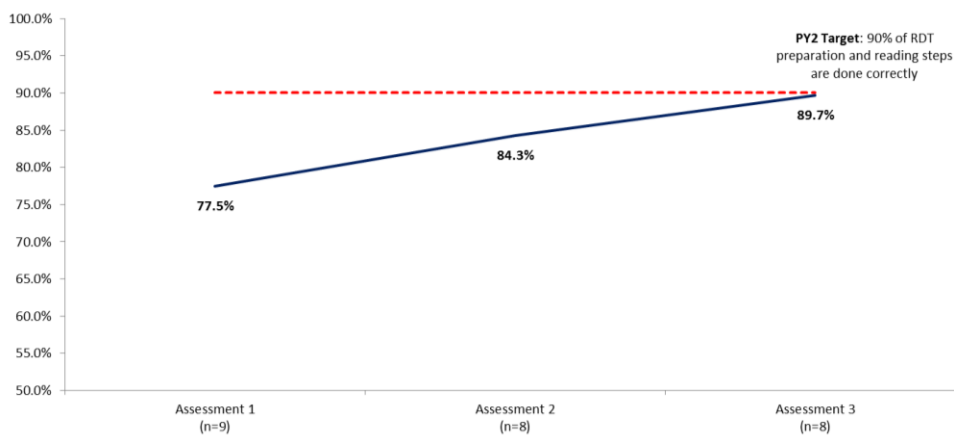
Figure 5. Malaria microscopy slide reading performance by assessment.



Note: This graph represents health facilities that have received successive OTSS visits, though not all OTSS visits may have occurred during the same OTSS round.

Figure 6 shows that on average, health facilities have nearly obtained the RDT performance target of 90% compliance to checklist by the third health facility assessment.

Figure 6. RDT performance by assessment.



Note: This graph represents health facilities that have received successive OTSS visits, though not all OTSS visits may have occurred during the same OTSS round.

*Objective 2: Increased percentage of patients suspected to have malaria or a febrile illness who receive a diagnostic test for malaria.*

- MalariaCare performed an assessment to evaluate the need for a private retail sector case management pilot study. This evaluation determined that more information about potential case management in the retail sector is needed; however, there are two other investigations planned for the private sector in Kinshasa through non-PMI funding mechanisms (Clinton Health Access Initiative and PSI), and the project will await these results before planning further interventions.

*Objective 3: Increased percentage of patients who receive appropriate treatment for malaria or other febrile illness—consistent with the result of the diagnostic test.*

- Adopted the clinical OTSS checklist through a joint evaluation by MalariaCare, PMI-EP, and the NMCP. It is currently in use for on-site health facility visits during clinical OTSS for the MalariaCare project.
- Trained 17 provincial-level physicians as clinical OTSS supervisors with a case management refresher training and OTSS supervision skills training. The addition of clinicians to the OTSS supervisor teams will complement the improved diagnostic efforts of the laboratory team by working with health facility clinicians to better use malaria test results, working to ensure that test-positive cases are treated with appropriate antimalarial regimens and test-negative cases receive proper work-up and treatment for non-malarial diagnoses.
- To date, provider adherence to negative test results as evaluated by records review by laboratory OTSS supervisors is well below the target of 70% compliance to results when making clinical decisions—currently about 25% compliance during the most recent round of OTSS visits. In addition, the OTSS visits as currently structured have not made significant gains in this indicator. The underlying reason for the low rate is under investigation, but MalariaCare believes that, as in other project countries, the addition of clinical OTSS supervisors will lead to significant improvements. The project believes that on-site mentoring of clinicians by clinician supervisors—particularly with the reliability of RDT results—will make rapid and long-lasting improvements in adherence.

*Objective 4: Strengthened laboratory systems at the country level for detecting malaria and other infectious diseases.*

- MalariaCare collaboratively developed a national archive of malaria slides (NAMS) protocol with the national reference laboratory (INRB), NMCP, and PMI-EP. Preparations are under way for submission of the protocol to the national ethics committee in the DRC. The INRB will be responsible for production and storage of the slides and the NMCP will coordinate the use of slides in national training and on-site proficiency testing. MalariaCare and PMI-EP will provide technical and logistics support and work to ensure the quality of the NAMS development.
- A national proficiency testing and training system has been initiated through the United Kingdom National External Quality Assessment Service (UK NEQAS) program, in which the INRB and the five targeted provincial reference laboratories are enrolled.
- Held a laboratory OTSS lessons learned workshop for 19 supervisors to review the current status of OTSS indicators as well as supervisor performance during OTSS visits. Reiteration of supervisor expectations during these visits was a recurrent theme throughout the workshop, especially as it related to completeness of data collection and mentoring opportunities when deficiencies in performance are observed.

## Challenges

Although there have been gains in average health facility attainment of QA indicators, a significant number of individual health care workers are still demonstrating malaria diagnostic skills well below the QA targets. For example, only 29.4% of observed laboratory staff (5 of 17 observed) during the most recent OTSS visits for which data are available demonstrated RDT competence to the  $\geq 90\%$  goal (compliance with checklist steps) and only 30% of the observed workers (9 of 30 observed) demonstrated microscopy preparation and reading competence at respective QA  $\geq 90\%$  targets.

## Next steps

At the national level, MalariaCare will continue to work with the INRB to develop the NAMS as well as support the Provincial Reference Laboratory in Katanga's parasitology departments along the path to accreditation by the WHO Strengthening Laboratory Management towards Accreditation approach. Under the coordination of the NMCP, MalariaCare and other partners will conduct a microscopy inventory survey in facilities under the national supervisory mechanism to assure that laboratories have the capacity to perform microscopy. MalariaCare will also work with the INRB and NMCP to develop a national competency accreditation program for malaria microscopy to establish, among other things, a cadre of experts who can perform microscopy QA visits and training.

To do this, MalariaCare will continue activities at the central level (in Kinshasa) and in PMI's focus provinces of Kasai Occidental, Kasai Oriental, Katanga, Oriental Province, and South Kivu. Activities in PY3 will aim to assure the standardization of high-quality case management practices in national-level planning, leverage provincial health facilities to disseminate best practices to downstream facilities, expand joint clinical and laboratory supervision to additional facilities, and work with the INRB to create a DRC NAMS for use in training and proficiency testing.

Specific activities for the coming program year include:

- Support reference laboratories at national and provincial levels in microscopy and RDT use.
- Train and supervise laboratory technicians and other health workers to perform RDTs at the health zone level.
- Build capacity in community case management in 43 new PMI targeted health zones, to be phased in with a focus on accessible rural districts.
- Assessment of the quality of case management in private-sector health facilities (not drug sellers or pharmacies) in three targeted provinces: Kinshasa, Katanga, and East Kasai.
- Laboratory support in six PMI-supported provinces, including rehabilitation, equipment, and office supplies of national, provincial, and selected general hospital laboratories.

## Ethiopia

The Ethiopian Public Health Institute (EPHI), formerly known as Ethiopian Health and Nutrition Research Institute, is developing a NAMS to be used for national accreditation of malaria microscopy, routine training of laboratory microscopists, and to support QA schemes. PMI began supporting this initiative in 2011 during the Improving Malaria Diagnostics project. MalariaCare has continued to provide technical support to EPHI and worked with the International Center for AIDS Care and Treatment Programs to complete the NAMS. EPHI is responsible for collecting donor samples, making slides, and validating parasite species by polymerase-chain reaction (PCR); Hydas World Health is responsible for the microscopic validation of each donor using a standard protocol of 12 independent expert slide readings. To date, Hydas World Health has validated 11 donors with four WHO Level 1 microscopists and two technically expert microscopists who are non-WHO tested.

### Key accomplishments

- Supported one EPHI staff member to travel to a malaria diagnostics laboratory at Cheikh Anta Diop University (Dakar, Senegal) to learn how to perform a PCR-based assay for Plasmodium species determination.
- Assisted EPHI to characterize and validate all NAMS donors by PCR, including those considered to be uninfected via microscopy review. This standard was recently recommended by WHO for development of national microscopist accreditation slide sets.
- Updated the Ethiopia NAMS database to include features for easy slide retrieval, including a method to auto-generate slide sets for routine refresher training, WHO external accreditation, and proficiently testing panels. By auto-generating slide sets, different slides will be used for each activity. This method will help to minimize problems related to scoring (e.g., participants memorizing commonly used slide identification numbers and diagnosis) and slide breakage due to overuse.

Table 2. Current NAMS composition, including donor categories, total number of slides, and validation results.

Parasite composition (based on microscopy)	Number of donors	Number of available slides	Number of donors with validation reading conducted	Validation
Negative	6	1,577	6	Microscopy only
<i>P. falciparum</i> alone	6	1,745	2	1 microscopy only, and 1 require PCR
<i>P. vivax</i> alone	15	4,406	10	4 microscopy only and 6 require PCR
Mixed <i>Pf/Pv</i>	3	850	0	TBD
Total	30	8,578	18	N/A

Note: TBD=to be determined; N/A=not applicable.

### Challenges

No major challenges to report.

### Next steps

During PY3, using carry-over funding from PY2, MalariaCare will work with the EPHI to complete the NAMS project. The final task is principally to ensure species and parasite count validation of all donor

samples including necessary PCR and microscopy review. ENRI reports that 14 donor samples need PCR and 16 have completed microscopy validation. The project will also assist in organization of the NAMS storage system and provide protocols for using the NAMS to develop proficiency testing panels.

Lastly, to further assist EPHI in capacity development, the project will sponsor a technical assistance trip by a malaria molecular scientist from Université Cheikh Anta Diop to assist in the transfer of other malaria-specific PCR techniques such as species and genotype identification and artemisinin-resistance testing.

## Ghana

In Ghana, MalariaCare is working to improve malaria case management across the continuum of care—from communities to health facilities—and in both the public and private sectors. Major accomplishments during PY2 include conducting MDRT for 20 regional supervisors at the national level and 245 laboratory staff from district hospitals at the regional level; completing one round of laboratory OTSS in collaboration with the Ghana Health Service's (GHS) Clinical Laboratory Unit; organizing national- and regional-level training on updated malaria treatment guidelines; and conducting 3,786 visits in two rounds of clinical OTSS in seven regions. The project also developed various training curricula and guidelines in support of Ghana's efforts to achieve universal diagnosis and treatment of malaria and other febrile illnesses.

### Key accomplishments

*Objective 1: Scale up and improve access to and availability of quality malaria diagnostic services, with a focus on the lower health facility level.*

- Improved supervisor competency in microscopy and RDTs from 57.55% to 91.5% pre- and posttest results respectively, on parasite identification during advanced MDRT. This training prepared the supervisors to act as master trainers who facilitate regional-level MDRTs for routine laboratory staff as well as provide support through OTSS. Mean scores for agreement were 78% (the WHO-recommended standard for malaria microscopy competency is 80%); however, there is a need to build competency in species identification and density (61% and 60% respectively, on posttest scores).
- These trainers then conducted regional-level MDRT for 245 laboratory staff in ten regions (see PMP indicator 1.f). The trainees then provided cascade training at district hospitals and major hospital laboratories. Table 3 shows the results of the regional MDRT.



Participants examining and reporting on malaria blood films. Photo credit: Isaac Osei-Owusu

Table 3. Percentage of microscopists attaining the WHO standard for parasite identification (agreement), species ID, and counting.

Region	Agreement			Species identification			Density		
	Pretest	Posttest	Δ**	Pretest	Posttest	Δ**	Pretest	Posttest	Δ**
Brong Ahafo	63%	<b>73%</b>	10%	23%	<b>58%</b>	35%	7%	<b>42%</b>	35%
Northern	53%	<b>67%</b>	14%	21%	<b>38%</b>	17%	8%	<b>43%</b>	35%
Eastern	51%	<b>74%</b>	23%	23%	<b>48%</b>	25%	16%	<b>41%</b>	25%
Volta	51%	<b>70%</b>	19%	23%	<b>43%</b>	20%	14%	<b>48%</b>	34%
Western	42%	<b>74%</b>	32%	14%	<b>58%</b>	44%	9%	<b>49%</b>	40%
Ashanti	43%	<b>69%</b>	26%	25%	<b>48%</b>	23%	11%	<b>49%</b>	38%
Central	59%	<b>71%</b>	12%	28%	<b>53%</b>	25%	14%	<b>38%</b>	24%
Upper West	57%	<b>73%</b>	16%	24%	<b>51%</b>	27%	8%	<b>50%</b>	42%
Greater Accra	68%	<b>78%</b>	10%	26%	<b>60%</b>	34%	13%	<b>42%</b>	29%
Upper East	59%	<b>82%</b>	23%	36%	<b>59%</b>	23%	21%	<b>48%</b>	27%

\*80% is the WHO-recommended standard for malaria microscopy competency.

\*\* Δ refers to the change in percentage points between pre- and posttest scores.

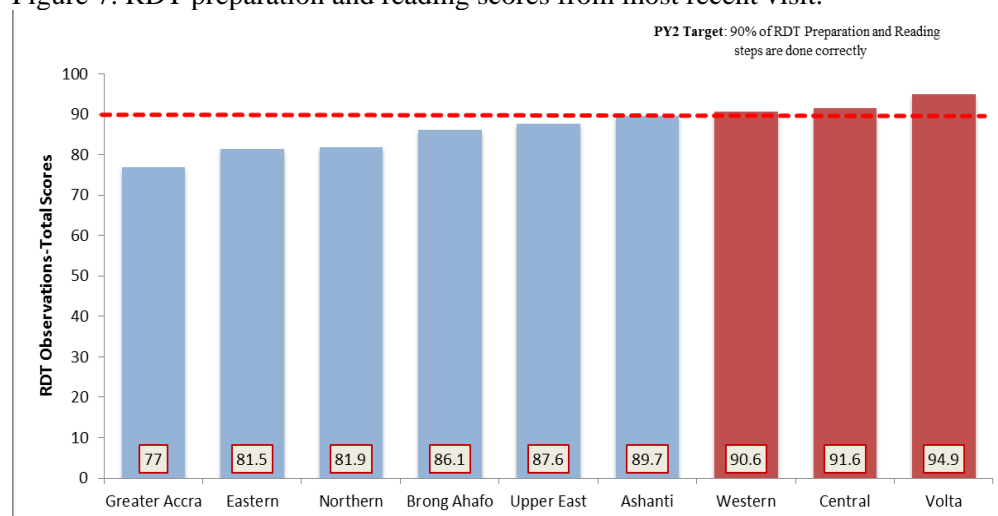
- Provided technical assistance and data management support to the Clinical Laboratory Unit, Institutional Care Division, and GHS to manage the OTSS laboratory program (see PMP indicator 1.1). Table 4 shows the critical laboratory OTSS results from the most recent OTSS visit, which occurred in November 2013. Establishment of the government-to-government funding mechanism led to delays in conducting further rounds of laboratory OTSS during PY2. These indicators will be reviewed with the Clinical Laboratory Unit to determine how to shift programmatic focus to address continued challenges with adherence and diagnostic competence.

Table 4. Ghana laboratory OTSS round 10 results (most recent visit).

Indicator	Observation type/level	Overall average HW/HF score	Total no. HF/HWs reporting	Target threshold scores	% HF/HWs scoring at/above target	No. HF/HWs scoring at/above target
Microscopy slide preparation, staining, and reading scores	HW	<b>81.0%</b>	779	≥ 90%	<b>43.6%</b>	340
RDT observation scores-laboratory staff (see Figure 7)	HW	<b>85.6%</b>	180	≥ 90%	<b>58.3%</b>	105
Slide validation	Facility	<b>93.8%</b>	189	≥ 90%	<b>84.1%</b>	159

Note: HW=health worker; HF=health facility; RDT=rapid diagnostic test; no.=number.

Figure 7. RDT preparation and reading scores from most recent visit.



Red bars indicate regions that have exceeded the target of 90%.

- Conducted a lessons learned workshop for 64 health care workers (see PMP indicator 1.c). Discussions at the workshop led to improvements in the way laboratory OTSS is conducted, including revision of certain aspects of the checklist. The workshop provided clinicians and laboratory professionals the opportunity to discuss the challenge of improving prescriber adherence to negative test results and focused discussions of proposed solutions, such as providing targeted on-the-job training to staff who have shown poor performance, and exploring the potential for conducting joint laboratory/clinical OTSS so that supervisors can reinforce teamwork and trust between clinicians and laboratory staff.
- Developed a national-level expert microscopist accreditation program designed to assess the capacity to accurately and consistently identify malaria infection at low density counts, and to correctly identify *P. ovale*, *P. malariae*, and mixed infections.

*Objective 2: Scale up and improve access and availability to quality malaria treatment with a focus on the lower health facility level.*

- Supported a national training-of-trainers (TOT) workshop on new malaria case management guidelines for 36 regional health staff. As shown under indicator 2.aa of the PMP, the percentage of supervisors demonstrating competence (scoring 80% or more on assessment) in malaria case management increased from 14% during the pretest to 57% in the posttest during this training—more than a threefold improvement. While this leaves 43% of supervisors below the target 80% score, the mean posttest score during this training was 78%. The participants who received high scores served as master trainers in the rollout of this training to regional- and district-level staff across the country.
- Trained 6,167 district and facility health officers such as doctors, nurses, and community health officers (CHOs) in nine regions on new malaria case management guidelines. The percentage of clinical providers under supervision demonstrating competence in preparation and reading of RDTs fell from 67% to 54%; however, the mean score remained just under the target at 89% (see PMP indicator 1.o). Additionally, through partnering with health professional bodies, participation in malaria case management training was accredited for the renewal of practice licenses based on posttest results, which attracted both private and public practitioners to participate.
- In response to low attendance by doctors at regular training programs, MalariaCare provided support to the NMCP and Medical and Dental Council to organize symposia to inform doctors of the



revisions to national case management guidelines. These symposia were accredited by the Medical and Dental Council to fulfill requirements for renewing medical licenses. More than 400 doctors participated in both symposia.

- Organized six regional OTSS lessons learned workshops to disseminate and discuss joint clinical/M&E OTSS round 1 data, collected during 2,019 health facility visits that provided supervision to an estimated 11,596 health workers. See Table 5 for results from the first two rounds of clinical OTSS.

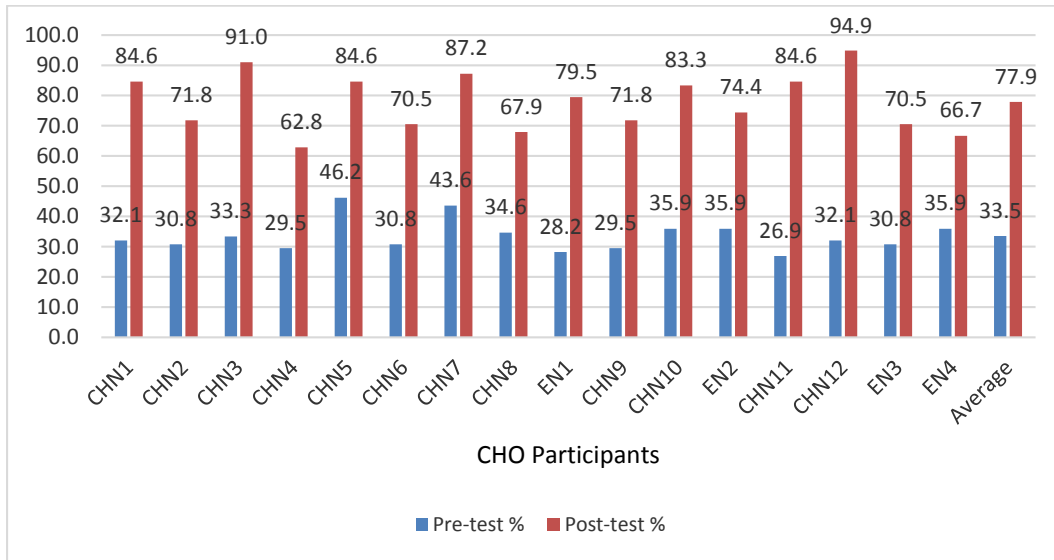
Table 5. Key findings from the first two rounds of clinical OTSS.

Indicator	Round 1	Round 2	Δ*
Percentage of facilities having malaria case management flowchart	68%	75.65%	7.65%
Percentage of facilities having RDTs	78%	93.45%	15.45%
Percentage of facilities having Artesunate Amodiaquine	78%	91.98%	13.98%
Trained in malaria case management	76%	85.50%	9.50%
Used correct case management protocols	94%	95.26%	1.26%

\* Δ refers to the change in percentage points between OTSS rounds 1 and 2.

- Provided technical support for the review and write-up of the updated integrated community case management (iCCM) guidelines for Ghana, instructing the use of malaria RDTs by community-based agents (volunteers) and integrating all community-level interventions aimed at reducing mortality and morbidity in children under 5 years old. Following the update, 17 national officers and 67 regional officers received refresher training on the revised iCCM guidelines. These officers then provided cascade training to 652 district-level supervisors nationwide. In PY2, 754 community-based agents from eight districts were trained to conduct RDTs per the revised iCCM guidelines. The remaining districts will continue this training in PY3.
- Liaised with the NMCP and the PPME (Policy, Planning, Monitoring and Evaluation Division of the GHS) to pilot a CHO/district hospital attachment program at seven locations in six districts. As part of this program, a checklist was developed to assess the skills of the CHOs in conducting a clinical assessment of a client presenting with febrile illnesses. Figure 8 represents the pre- and post-internship test results. On average, the assessed knowledge and skill increased from 35.5% at pretest to nearly 77% posttest.

Figure 8. Pre- and posttest results of CHO clinical attachment in Biakoye District, Volta Region.



The GHS is utilizing the results of these attachments as a guide to develop a curriculum for CHO internships across the continuum of care provided at that level. In PY3, MalariaCare will scale up the program to ten additional districts.

*Objective 3: Improve the accuracy, reliability, and availability of health information management systems.*

- Provided technical support and coordinated with technical teams from the NMCP, PPME, and other partners to update the GHS SOPs on health information management. With the support of MalariaCare, 5,000 copies of the SOPs were printed and distributed to all district health management teams in the country.
- Supported the NMCP in developing an M&E section of the Ghana Malaria Strategic Plan (2014–2018), which serves as the main reference for the development of concept notes under the new round of Global Fund support by the NMCP.
- Trained a total of 385 health information officers from seven regions on data quality improvement and data management using the updated GHS SOPs on health information management by regional- and national-level trainers (see PMP indicator 3.e).
- The project conducted two rounds of M&E OTSS, where health information officers provided on-site training and supervision on malaria data capture and reporting (see Table 6). Currently, 86.5% of these officers are now considered competent in data collection and recording (see PMP indicator 3.h).



Table 6. Key findings from the first two rounds of OTSS.

Indicator as seen from OTSS data	Round 1	Round 2	Δ*
Percentage of records staff trained in malaria data reporting	71.50%	87.17%	15.67%
Percentage of records units that train relevant staff on malaria data capture and reporting	59.48%	79.51%	20.03%
Percentage of persons in charge of DHIS use trained in DHIS2	46.02%	93.87%	47.85%
Percentage of facilities having data validation team	35.50%	60.85%	25.35%
Availability of consulting room register	95.67%	98.14%	2.47%
Availability of outpatient division morbidity forms	95.41%	98.28%	2.87%
Availability of monthly antimalarial reports	93.01%	97.33%	4.32%

Note: DHIS=district health information system.

\* Δ refers to the change in percentage points between OTSS rounds 1 and 2.

Health information officers assessed the accuracy of malaria data reported to DHIS2 against source documents (See Table 7). Facility staff were coached on malaria reporting tools/indicators and their sources, using SOPs in data management as a guide.

Table 7. Data audit on malaria indicators results.

Data sources for suspected malaria cases	Data accuracy	
	HFs with data within +/- 10% of verified data	HFs showing no deviation
Source document to DHIS	65.61%	42.34%
Summary document and DHIS	79.48%	71.10%

Note: HF=health facility; DHIS=district health information system.

*Objective 4: Strengthen technical management ability at the regional level for implementing programs and activities.*

To reemphasize the importance of OTSS to the regional and district health management teams and promote data-driven decision-making, MalariaCare developed a data utilization plan based on OTSS visits and used it in the training of health information officers prior to the lessons learned workshops. District teams, now equipped with skills for data utilization, are able to offer targeted support to health facility staff based on their own data.

**Utilizing OTSS data for decision-making**

At a lessons learned workshop, the district team from Buisla South in the Upper West region saw that OTSS data indicated most health workers performing RDTs were not trained. Resources were quickly mobilized to organize RDT training for the untrained staff.

**Support to former Focus Region Health Project regions**

Following the close-out of the Focus Region Health Project in February 2014, PMI requested that MalariaCare support existing malaria activities and bring the case management capacity of the three regions (Greater Accra, Central, and Western) up to the level of Ghana's other seven regions that received support from MalariaCare during PY2. As of the end of September 2014, activities had begun in only the Central and Western regions. The main accomplishments in those regions are described below:

- Trained 2,190 doctors, physician/medical assistants, pharmacists, clinical nurses, community health nurses, CHOs, midwives, and disease control officers on the appropriate use of malaria RDT kits and

correct documentation of test results. It is expected that this training will lead to improved malaria case management and quality of care in these two regions.

- Trained 2,316 regional and district facilitators, doctors, physician/medical assistants, pharmacists, clinical nurses, community health nurses, CHOs, midwives, and disease control officers on the revised malaria case management treatment guidelines in the Western and Central Regions. It is expected that these providers will be able to properly assess and manage all malaria cases for appropriate treatment to reduce malaria mortality and morbidity in these two regions.
- Trained 21 regional and 120 district officers to build their capacity as supervisors for OTSS in the Central Region. MalariaCare supported regional and district supervisor teams in the Central Region to conduct OTSS visits to 384 facilities to strengthen the capacity of providers to improve the quality of care.

## **Challenges**

The use of paper-based checklists for laboratory and joint clinical/M&E OTSS posed a significant challenge to the completion of all planned OTSS rounds in the year. There were significant delays in collating, entering, and analyzing the OTSS data for timely decision-making. This affected the ability of the districts to conduct all planned rounds of OTSS. Only two rounds of the three planned clinical/M&E OTSS were conducted. In PY3, the introduction of an electronic data collection system will ensure timely entry and access to OTSS data for feedback, improvement, and decision-making.

Delays in establishing the government-to-government funding mechanism hindered implementation of laboratory OTSS activities. Therefore, it was only possible to conduct the first of four planned rounds of laboratory OTSS. This also affected the planned proficiency testing panels that were to be implemented alongside laboratory OTSS.

## **Next steps**

In PY3, a refresher training will be conducted for diagnostic OTSS supervisors with an emphasis on the specific deficiencies identified in PY2 in order to improve their scores to the WHO-recommended 80% competency standard. Moreover, proficiency testing panels will be established for supervisors in PY3 to further assess their competence in microscopy at least twice a year. Using established slides to ensure a continuous assessment of their competencies post-MDRT will assist supervisors in maintaining their ability to provide microscopic coaching and support to routine laboratory personnel. The three best-performing supervisors will be recommended to participate in the WHO expert-level certification in Kenya.

The involvement of regional and district health management teams in activity planning will be increased to ensure a complete integration of MalariaCare's planned activities into theirs. This will further strengthen the ownership, cooperation, and eventual sustainability of implementation strategies.

QA strategies will be revised to provide the requisite technical assistance to the GHS within our mandate. Among others, we plan to introduce a targeted mentorship program to support low-performing facilities, pilot a community-based agent OTSS program, and introduce electronic OTSS checklists to improve turnaround times and improve the leadership and program management skills of district and regional managers.

Training institutions and professional/regulatory bodies in the country will be engaged to update their teaching notes and continuing professional development programs to reflect the updates to febrile case management protocols undertaken in PY2.

In the first quarter of PY3, MalariaCare will work in all ten of Ghana's regions. Beginning in January 2015, Volta, Greater Accra, Western, Central, and Northern regions will transition to the Systems for Health project. MalariaCare will, however, continue to implement diagnostic capacity strengthening activities in all ten regions.

## Guinea

Activities in Guinea centered on starting up laboratory supervision visits at the nine targeted national and regional hospitals across the country. Initial activities included an MDRT, from which OTSS laboratory supervisors were selected out of the pool of top-performing participants, and a participatory review of laboratory and clinical supervision tools. A cadre of clinicians was provided refresher training on febrile illness case management. Subsequently, the identified OTSS laboratory and clinical supervisors were trained on OTSS activities and methodologies before heading to the field to conduct the OTSS visits. Much effort has been put into developing joint supervision with the bilateral project StopPalu. Multiple in-country and virtual meetings have been held leading to the identification and training of clinical supervisors through the StopPalu consortium.

### Key accomplishments

*Objective 1: The accuracy of diagnostic testing for malaria is improved to greater than 90%.*

- Supported refresher training on malaria laboratory diagnosis for 25 health workers. Not only did this training serve to provide intensive microscopy refresher training to the selected participants, it was also used to strongly emphasize and encourage cascade training in the participants' own laboratories and to draw the pool of supervisors used to conduct the OTSS visits.
  - Among the 25 MDRT participants, 7 displayed microscopy skills at levels similar to those designated as malaria diagnostic experts; 4 of the 9 OTSS sites had a laboratory staff member who attended this MDRT.
- MalariaCare also developed a revised supervision tool with the NMCP and StopPalu that integrates malaria laboratory and clinical components in order to facilitate a joint laboratory/clinical supervision scheme to be implemented in collaboration with the StopPalu project.
- Eighteen laboratory supervisors attended a training session on OTSS activities and methodologies. One of the facilitators of the training served as a supervisor to round out the team compositions (9 teams of 2). These 18 participants were pulled from the best-performing technicians who attended the MDRT.
- Through close coordination with StopPalu, MalariaCare invited 11 clinicians to Conakry for refresher training on clinical case management of febrile illnesses. All clinicians, as their laboratory supervisor counterparts, were also trained on OTSS activities and methodologies before being deployed to the field to conduct OTSS.
- The first round of OTSS was conducted exclusively for laboratories in March 2014 at the nine targeted national and regional hospitals across Guinea. Each region of Guinea is covered in



Laboratory staff, Kindia Regional Hospital.  
Photo credit: Dr. Ramata Doukoure

MalariaCare's OTSS scheme. The second and third rounds of OTSS were joint clinical/laboratory visits to these same nine national and regional hospitals.

- Over the course of these OTSS visits, a total of 174 laboratory technicians and clinicians participated in on-site training in malaria microscopy/RDT diagnostic procedures. The majority of these informal training activities occurred as a result of diagnostic errors noted during laboratory staff observations.
- All visited OTSS sites reported having at least one provider formally trained in RDTs; 8 out of 9 had at least one provider formally trained in malaria microscopy within the 12 months preceding the supervisory visit.
- Eight out of 19 (42.1%) observed laboratory staff performed at 90% or greater with respect to RDT administration; the overall mean score was 75.9%.
- Fifteen out of 23 (65.2%) observed laboratory staff performed at 90% or greater with respect to malaria slide preparation, staining, and reading; the overall mean score was 93.4%.
- OTSS supervisors recorded that 7 of 8 (87.5%) OTSS sites had all of the following: presence of a functional microscope, slides for malaria microscopy, Giemsa stain, all recommended SOPs/bench aids, and at least one formally trained technician in malaria microscopy.
- All 9 targeted OTSS sites had all recommended SOPs and bench aids for malaria diagnostic procedures.

*Objective 4: Strengthened laboratory systems at the country level for detecting malaria and other infectious diseases.*

- Eight out of the 9 (89%) OTSS sites had 90% or greater agreement on malaria slide re-checking compared to OTSS supervisor results; the overall mean score was 96.7%.

## **Challenges**

The Ebola virus outbreak has required diversion of the country's resources for health toward fighting the crisis, and thus resulted in an inability to continue implementing some planned MalariaCare activities. MalariaCare plans to resume activities once the situation allows.

Another challenge has been the coordination with local partners, due to the lack of MalariaCare in-country presence. To address this, MalariaCare worked closely with local implementing partners and dedicated support staff to help coordinate efforts to roll out joint clinical/laboratory OTSS.

In addition, only 28% of those who participated in the MDRT were able to obtain scores similar to experts. This result is not surprising given the limited training that microscopists in Guinea have received. Further training is recommended. In addition, OTSS supervisors should place additional and continued emphasis on malaria diagnostic procedures (microscopy/RDTs) and the skills necessary to correctly read and interpret malaria slides during subsequent rounds of OTSS.

## **Next steps**

One round of joint OTSS from PY2 will be conducted early in PY3. MalariaCare will continue working to transition activities to StopPalu and to provide recommendations based on MalariaCare lessons learned.

## Liberia

MalariaCare collaborates with the Liberian Ministry of Health and Social Welfare's (MOHSW) and the NMCP to strengthen malaria diagnosis in all 15 counties across the country. Key activities this year included strengthening the capacity of county health teams to conduct malaria diagnostic QA, training, supervision, and data management.

### Key accomplishments

- During PY2, MalariaCare hired an in-country coordinator, established a project office, and initiated project activities, including developing an integrated supervision checklist and assisting the NMCP to update national diagnostic guidelines for malaria.
- Worked closely with Liberia's national HIV and tuberculosis programs to begin collaborative development of an integrated health facility supervision checklist. This joint tool is anticipated for use by the national malaria, tuberculosis, and HIV control programs and is expected to help the Liberian MOHSW reach its goal of moving toward integrated QA visits to health facilities.
- Assisted the MOHSW and the NMCP to update national laboratory diagnostic guidelines. As part of this effort, MalariaCare organized a three-day workshop in Monrovia to gather input on the policy from more than 20 stakeholders. Following the workshop, universal testing of suspected malaria cases was added as a standard practice in the new guidelines and a draft policy was distributed for review.
- MalariaCare supported refresher training for 19 county diagnostic supervisors on malaria diagnostics. Ideally, scores for sensitivity and specificity for the assessed laboratory supervisors would have been  $\geq 90\%$  and  $\geq 80\%$ , respectively; four participants reached this level for sensitivity and nine did for specificity. Parasite detection scores increased from an average of 63% at pretest to 74% at posttest, and four participants scored greater than 80%. For the majority of participants, minimum desired standards for supervisors were not met regarding overall MDRT scores, but supervision activities might begin in the counties where at least supervisor parasite detection scores met minimum standards (i.e.,  $\geq 80\%$ ). Otherwise, the program may consider using RDTs for case management training/supervision activities until supervisor microscopy scores reach desired levels.
- MalariaCare identified Nimba, Biong, Grand Gedeh, and Monsterrado counties as ready to start malaria microscopy QA activities because laboratory supervisors in these counties had good parasite detection competence. These counties contain about 60% of Liberia's population and contribute most malaria cases.



Participant at microscopy training, Liberia. Photo credit: Medical Care Development International



Participants at diagnostics training of trainers, Liberia. Photo credit: Medical Care Development International

### Challenges

The Ebola virus outbreak has required diversion of the country's resources for health toward fighting the crisis, and thus resulted in an inability to continue implementing planned MalariaCare activities. Since July, central-level and field activities have been on hold. MalariaCare plans to resume training and field supervision once the situation allows.

MalariaCare previously sponsored three WHO-accredited microscopists to attend a reaccreditation course in Nairobi, Kenya; however, they were not able to maintain their high level of accreditation (Level 1 or 2) during the reaccreditation. The principal reason for the regression in accreditation levels was the lack of skills needed for parasite density determination. MalariaCare planned to develop these technicians as in-country trainers, but in light of their performance at the external competency assessment of malaria microscopy (ECAMM), the project would first need to reassess their current technical capacity to perform malaria microscopy and then plan for further refresher training before deploying them as national-level trainers.

### **Next steps**

Given uncertainty around the Ebola outbreak, remaining PY2 activities are expected to be implemented later in PY3. MalariaCare then plans to work with the MOHSW to continue decentralizing malaria case management capacity, working in particular to strengthen the case management and technical capacity of the county health teams. The project will also continue working at the national level to strengthen diagnostic services, and to support efforts to develop a decentralized malaria case management QA program.

## **Madagascar**

Madagascar is a new country for MalariaCare in PY2. This year, the team designed and planned for a health facility survey to assess malaria and febrile case management capacity. The assessment will be led by teams of clinical and laboratory surveyors and survey supervisors who will use tablets to efficiently upload data and facilitate analysis for further use. Results will inform MalariaCare's work plan activities in Madagascar.

### **Key accomplishments**

- Traveled to Antananarivo, Madagascar, in February to meet with USAID and partners. The team developed the concept for the rapid assessment of faith-based organizations and nongovernmental private-sector health facilities to determine existing capacity to implement high-quality case management that can be used as the basis of planning to improve capacity in those facilities.
- Received approval from USAID Madagascar mission, the Madagascar institutional review board (IRB), and the MOH to begin conducting the health facility survey.
- Developed a survey tool to be used on an electronic tablet in the assessment and identified participating facilities.
- Modified the survey tool to include public health facilities after the lifting of US government restrictions on funding to the Madagascar government.
- Identified and engaged a consultant who will serve as a team lead for the survey and engaged teams of surveyors who will conduct the survey.

### **Challenges**

As noted in the semiannual report, health facility survey activities were delayed due to the time required to obtain ethical clearance from the Madagascar IRB. The team continued to engage the IRB, malaria experts in country, and local organizations to help answer questions, and approval was received late in PY2.



## Next steps

The health facility survey will be conducted in early PY3, per the approved work plan. The results of the survey, demonstrating strengths and weaknesses of malaria and febrile case management, will be used to tailor and inform MalariaCare's work in PY3.

## Malawi

In PY2, MalariaCare worked with the MOH, the NMCP, and other partners to strengthen malaria case management efforts that started in PY1. The project has focused efforts in this reporting period on diagnostic training; supportive supervision to health care workers in case management; ensuring timely, accurate, and complete information on diagnostics through the distribution of new laboratory registers; and improving diagnostic capabilities through the supply and distribution of spare parts and cleaning materials for microscopes. MalariaCare remains committed to working with the MOH and NMCP in the coming years to provide a comprehensive, treatment-seeking approach for identifying, testing, and treating suspected malaria cases in Malawi.

### Key accomplishments

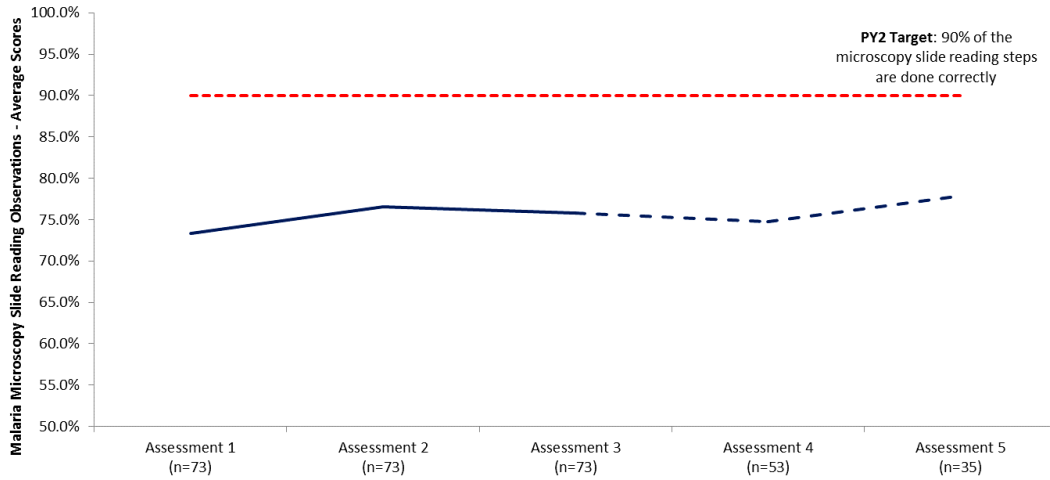
*Objective 1: The accuracy of diagnostic testing for malaria is improved to greater than 90%.*

- In collaboration with the NMCP, the Public Health Reference Laboratory, and the Diagnostics Unit of the MOH, MalariaCare trained 20 laboratory technicians from 20 district hospitals that routinely perform microscopic diagnosis of malaria. Pre- and posttests were used to measure microscopy skills (agreement of sensitivity and specificity, species identification, and density). The mean score for agreement of sensitivity and specificity at posttest was 90% (a 13-point change), which exceeds WHO's required minimum parasite detection score of 80%. A 44-point improvement was observed between pre- and posttest scores in parasite quantification. The average score for parasite quantification at posttest was 51%, in line with the minimum score of 50% required for WHO expert accreditation of Level 1 microscopists. A 20-point improvement was observed between pre- and posttests for parasite identification with a mean score of 50% at posttest.
- Provided targeted OTSS support across 29 districts, reaching 273 of the 500 targeted health facilities and supporting 967 providers through one round of OTSS. Data for the second round of OTSS, conducted late in PY2, are expected to become available within the first six months of PY3. Malaria microscopy slide reading performance is of particular importance in lower-level laboratories, where an analysis of slide reading performance over time showed that laboratories are still underperforming after five assessment visits (although the average score is close to 80%) (see Figure 9). Slide reading performance includes parasite detection, parasite speciation, and parasite density. Many microscopists at the subdistrict level have difficulty with parasite speciation and counting. Further discussions with the NMCP will be conducted in PY3 to determine necessary skills at different laboratory levels in Malawi, with recommendations focused on parasite detection at the subdistrict level and a focus on speciation and counting at the district and regional levels.



Microscopy training, Malawi. Photo credit: Petros Chirambo

Figure 9: Malaria microscopy slide reading performance.



Note: HF=health facility; PY2=project year two. The true trends for the presented subsets of HFs are represented by solid lines; the dotted lines show trends for the same facilities from the original subset for which data points were available. The drop in the N values at these points in the graphs represent lags in assessment scores and, as OTSS pushes forward, facility assessment scores will become increasingly available to fill in the gaps.

- Supported two MOH laboratory staff to participate in WHO’s External Accreditation in Malaria Microscopy training to build the capacity of microscopists in the field. Participation in this accreditation training will contribute to building a core group of experts at the national level. One participant scored a Level 2, and now has the expertise necessary to lead MDRT.

*Objective 2: Increased percentage of patients suspected to have malaria or a febrile illness who receive a diagnostic test for malaria.*

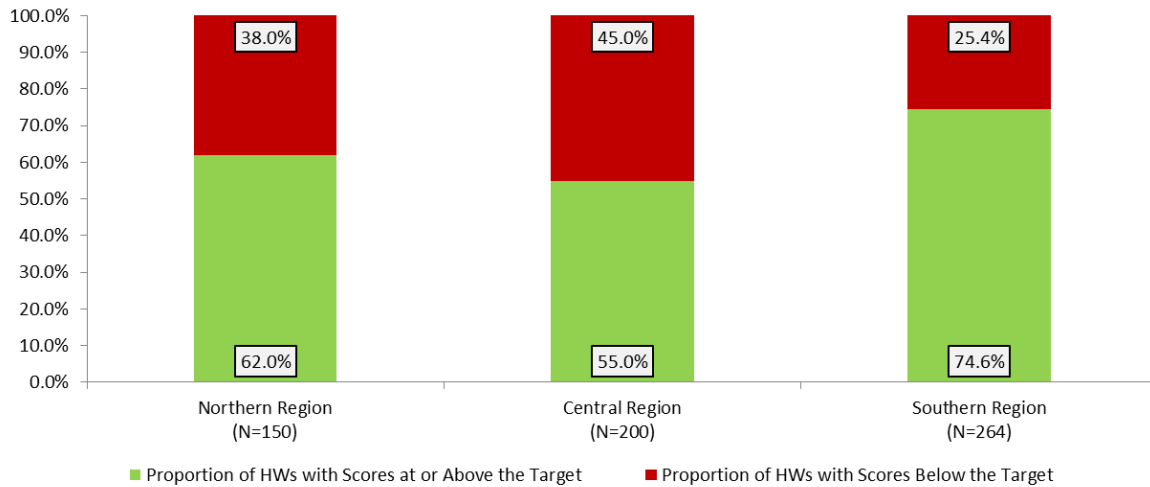
- Increased the number of facilities with the capacity to conduct RDTs to 98% of the 500 targeted facilities. By the end of PY2, these facilities had one or more providers trained in RDTs. As shown in Table 8, RDT competence among those trained by MalariaCare was strong, with mean scores of 88.4% and 88.5% for all staff and laboratory staff, respectively. This shows that, on average, providers are nearing the 90% target. However, the range (50-100%) shows that some providers still need additional support. In addition, as Figure 10 shows, there are also regional differences (district differences not shown) in the percentage of providers who are able to score above the 90% threshold in performing RDT steps correctly.

Table 8. Key diagnostics indicators for RDT support, OTSS round 10.

Indicator	Minimum	Mean	Maximum	Median	Total obs
RDT competence scores—all staff types	50.0%	88.4%	100.0%	88.5%	930
RDT competence scores—laboratory staff	50.0%	88.5%	100.0%	88.5%	505

Note: RDT=rapid diagnostic test; obs=observations.

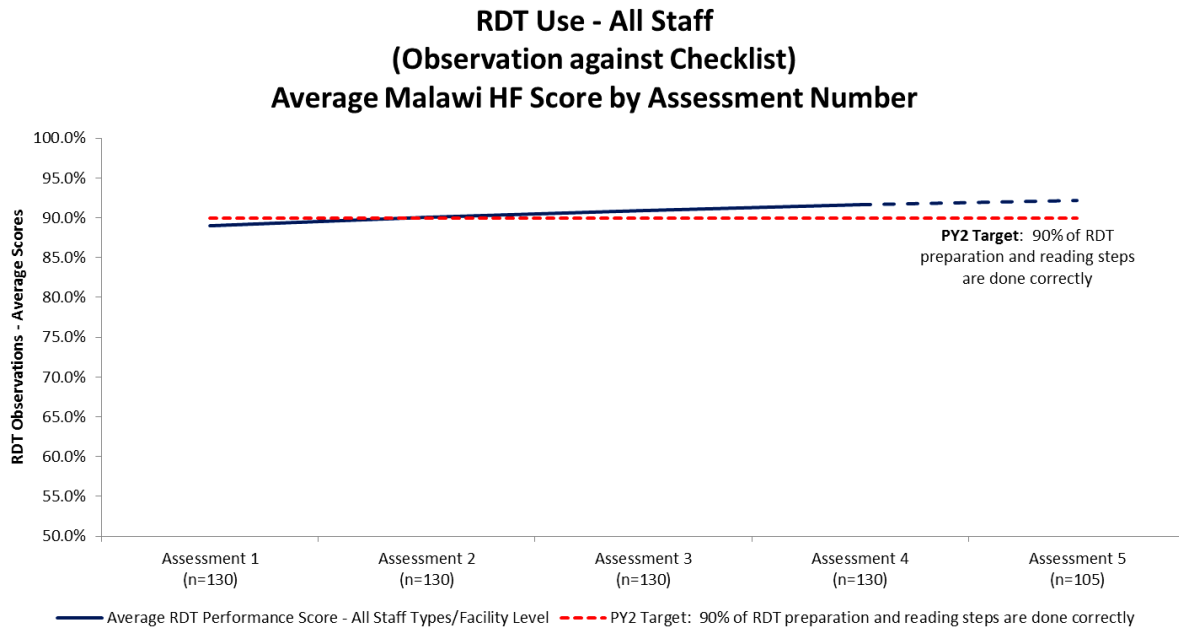
Figure 10: Percentage of targeted laboratory technicians demonstrating competence in RDTs.



Note: RDT=rapid diagnostic test; HF=health facility; PMP=performance monitoring plan.

- Continued OTSS targeted to specific challenges in RDT performance is needed to bring these facilities above the threshold. Figure 11 shows the competence in RDT use over time, based on the number of OTSS visits the facility has received. This demonstrates that overall RDT competence is high. Analysis at the health facility level should be used to ensure that all health workers achieve or maintain the overall competence indicated, and continued and consistent OTSS is still necessary to achieve that.

Figure 11: Competence in RDT use over time.



Note: RDT=rapid diagnostic test; HF=health facility.

RDT performance was measured across the same 130 health facilities for 4 consecutive assessments. The 5<sup>th</sup> assessment shows a truncated health facility count; only 105 of the original 130 facilities had RDT performance scores. The true trends for the presented subsets of HF's are represented by solid lines; the dotted lines show trends for the same facilities from the original

subset for which data points were available. The drop in the N values at these points in the graphs represent lags in assessment scores and, as OTSS pushes forward, facility assessment scores will become increasingly available to fill in the gaps.

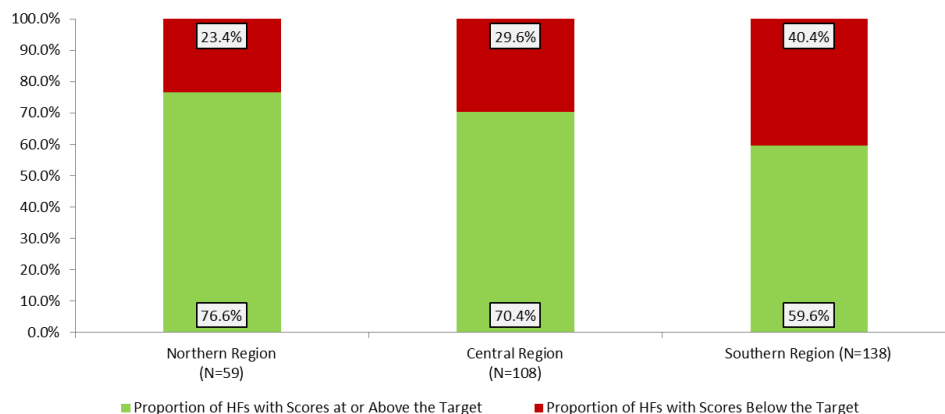
*Objective 3: Increased percentage of patients who receive appropriate treatment for malaria or other febrile illness—consistent with the result of the diagnostic test.*

- Supported the NMCP to conduct ten case management trainings, in which a total of 299 providers from Mzuzu and Mchinji districts were trained. Among participants, average pretest results were 40.3% (range: 18%–56%) and 45.0% (range: 18%–67%) for Mzuzu and Mchinji, respectively. There was an average increase of 30 percentage points in the posttest results: 71.6% (range: 33%–95%) in Mzuzu and 75.1% (range: 42%–87%) for Mchinji. The median did not deviate significantly from the mean; however the range in post-test scores indicates that some providers require additional support during follow-up supervision visits. MalariaCare provided additional mentoring to nine trainers who now support case management training in other districts and will provide follow-up supervision to all providers trained.
- In addition to assessing knowledge gained through RDT trainings, the project also focused on key case management competencies, including RDT panel reading, classifying cases as uncomplicated or severe, managing malaria in pregnancy, calculating the dose of injectable artesunate, and conducting exercises with stock card.
- Provided on-the-job training for 349 providers in appropriate malaria treatment during the first round of joint OTSS, exceeding the target of 273 providers. Although overall adherence to test results was high, there were regional differences (see Figure 12).



Malaria Case Management Training, Malawi. Photo credit: Tedbabe Degefie

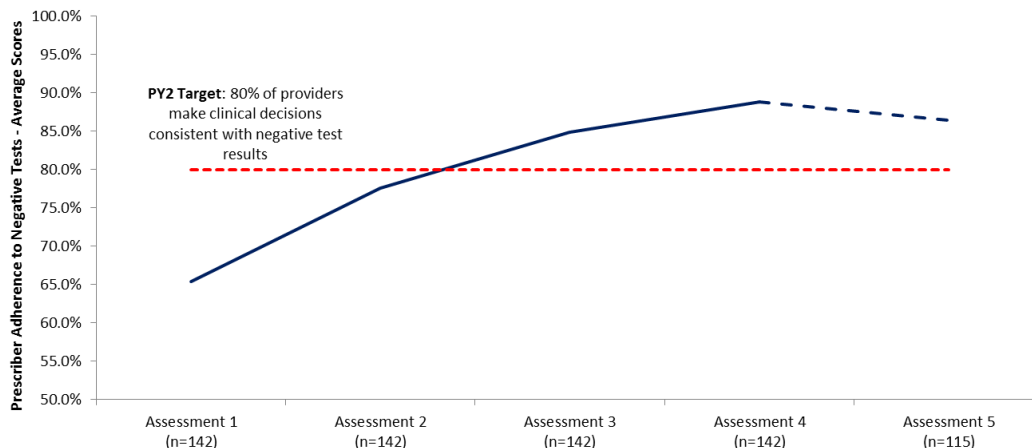
Figure 12: Percentage of targeted clinicians adhering to test results.



Note: HF=health facility; PMP=performance monitoring plan.

- Improved provider adherence to negative test results over time as facilities receive sequential OTSS visits. Figure 13 shows the improvement in adherence between the first through the fifth clinical OTSS visits. By the third visit, the average score for adherence to a negative test result was above the targeted 80%. Continued and consistent clinical OTSS visits are important to maintain these scores.

Figure 13: Prescriber adherence to negative test results.



Note: HF=health facility; PY2=project year two. The true trends for the presented subsets of HFs are represented by solid lines; the dotted lines show trends for the same facilities from the original subset for which data points were available. The drop in the N values at these points in the graphs represent lags in assessment scores and, as OTSS pushes forward, facility assessment scores will become increasingly available to fill in the gaps.

*Objective 4: Strengthened laboratory systems at the country level for detecting malaria and other infectious diseases.*

- Helped convene and support the WHO Technical Working Group meeting on diagnostics, which resulted in revised National Malaria Diagnostic Guidelines for Malawi. Printing and dissemination of the guidelines to laboratory centers will be supported in PY3.
- Revised clinical and diagnostic supervision checklists to align with international standards and developed an integrated checklist for joint supervision to further support implementation of the guidelines at the facility level. To prepare for broad rollout of the checklists alongside rollout of electronic tablets for reporting, eight supervisors were trained to pilot these new checklists.
- Worked closely with the NMCP to develop the NAMS protocol and training materials, and supported a meeting of the diagnostic task force to introduce the protocols. The IRB/technical working group in Malawi determined that NAMS constitutes routine monitoring and does not require IRB approval.
- Conducted two joint lessons learned workshops for clinicians and diagnostic staff to coordinate data analysis and encourage use of OTSS data for decision-making. As a result, participants generated reports outlining specific recommendations and next steps to address gaps and enhance the intended outcomes of OTSS activities. Reports were shared with stakeholders and are being used to support follow-up programming.

**Challenges**

During the ten initial case management training activities conducted in PY2, coordinating frequent and simultaneously occurring training activities with the schedules of district health facilities and the NMCP facilitators was challenging. The team worked closely with facilitators to anticipate schedule conflicts and plan ahead. MalariaCare also developed a more detailed facilitators’ guide, ensuring that learning objectives adequately targeted the desired competencies while also providing guidance on monitoring following the training. To address this, detailed trip reports were prepared and debrief/refresher sessions were held to prepare the in-country teams and NMCP facilitators so that they can best plan for training, anticipate and resolve challenges, and continue to enhance the quality of training and capacity-building efforts in PY3.

The development of the NAMS was delayed in order to align the existing protocol with the WHO global initiative to standardize malaria slide banks. To address this, MalariaCare worked closely with NMCP to revise the protocol to align with WHO guidance, prepare training materials, and clarify ethical review procedures. Authorities recently determined that NAMS does not require full IRB review.

During lessons learned workshops, supervisors noted that many non-clinical providers were administering RDTs. MalariaCare proposed training these non-clinical staff in RDTs; however, activities were postponed pending the results of a pilot that will help inform the Malawi Medical Board's policies on who is authorized to perform RDT diagnosis and at what level of the health system. MalariaCare will continue to work with the NMCP and other bodies within the MOH to clarify the way forward.

### **Next steps**

Using lessons learned from initial case management training conducted in PY2, MalariaCare will continue to provide support for capacity-building in broader case management, including the use of injectable artesunate to manage life-threatening cases of severe malaria. The project team will expand case management training and follow-up supervision to nearly 2,851 health workers in PY3.

MalariaCare piloted a new electronic supervision checklist for use on tablets to facilitate complete and rapid data entry and analysis. The project will work with the NMCP and the Support for Service Delivery Integration (SSDI) project to roll out the checklist for use in tablet-based OTSS. This checklist will include more detailed information on specific challenges with malaria diagnosis and treatment.

There is a continued need to strengthen provider adherence to negative malaria tests (adherence is still only at 68.8% overall, though there is strong improvement with consistent OTSS visits). Implementing a revised checklist, with detailed sub-indicators of performance and a focus on documenting challenges, is expected to enable the project to document and target specific challenges to adherence.

## **Mozambique**

Mozambique is a new addition to MalariaCare's focus countries in PY2. During the first half of the year, the MalariaCare team conducted an introductory trip to meet with the PMI mission and to discuss and determine project activities. A second technical visit was made to develop a work plan and to work with the National Institute of Health of Mozambique and stakeholders to develop a QA framework for diagnosis of malaria and other febrile illnesses. This QA framework is part of MalariaCare's efforts to strengthen laboratory systems for malaria diagnostics and improve provider competence to manage malaria within the context of febrile illness.

In line with the MOH's decentralized approach, MalariaCare's strategy in Mozambique is to focus activities on central-level support to strengthen the capacity of the NMCP and National Institutes of Health (INS) to provide nationwide support to high-quality malaria diagnosis and treatment, as well as to develop the capacity of provincial- and district-level health teams in two of the highest burden provinces, Zambezia and Nampula. Support in Zambezia and Nampula, through a combination of our QA activities, will target all public health facilities, while assessing the capacity of the private sector to provide case management services. The QA activities include peer-to-peer mentoring, OTSS, lessons learned workshops, MDRT, training of trainers/supervisors (TOT), and RDT and QA training. Measuring indicators in our PMP will be facilitated by the rollout of an electronic data collection tool linked to the country DHIS2 platform for programmatic decision, real-time adjustment by supervisors, and country-level decision-making by the NMCP and INS. A MalariaCare in-country coordinator was hired in October 2014, and MalariaCare is continuing recruitment for provincial-level coordinators.

## Key accomplishments

- Conducted an introductory visit to Maputo in October 2013 to meet with the PMI mission and develop a draft scope of work for MalariaCare in Mozambique.
- Traveled to Maputo in late January 2014 to participate in the development of a national QA framework for the diagnosis of febrile disease.
- Developed a work plan for MalariaCare activities, successfully recruited a national coordinator to oversee MalariaCare activities in country, and actively continued recruitment of a project manager and regional coordinator to manage implementation of activities.
- Initiated central-level support to help finalize Mozambique's national QA framework, support a national-level data manager, and include central staff in project-supported MDRT and TOT for QA activities.

## Challenges

No significant challenges to report.

## Next steps

As MalariaCare's PY3 work plan was approved by PMI, the team recruited key in-country personnel and started implementing planned activities in October 2014. MalariaCare has completed preparations for an MDRT that will include central staff and provincial staff from Zambezia and Nampula. Full implementation of activities in Mozambique will continue during PY3, including MDRT, RDT, and QA training, training of laboratory and clinical supervisors, and initiation of QA activities that will include OTSS, lessons learned workshops, and peer-to-peer mentoring. To improve country-level access to key programmatic data and to facilitate shared decision-making among the NMCP and provincial- and district-level health teams, MalariaCare will initiate electronic data collection and help link programmatic data with Mozambique's current DHIS2 platform. In addition to supporting PY3 activities in Zambezia and Nampula, MalariaCare will begin preparing for implementation of project activities in Cabo Delgado and Tete in PY4. The team will also assess private-sector case management activities in Mozambique to help plan for project efforts to engage the private sector.

## Nigeria

In Nigeria, MalariaCare is partnering with the National Malaria Control Program, the Expanded Social Marketing Project in Nigeria (ESMPIN) led by Society for Family Health, and state health authorities to implement and evaluate a pilot to assess the ability of private-sector health providers to manage cases of malaria and other febrile illnesses in accordance with national health standards. The pilot will be implemented by ESMPIN and supports the training of approximately 400 patent and proprietary medical vendors (PPMVs) in community case management of malaria, diarrhea, and pneumonia. PPMVs are a diverse group of private providers that sell pharmaceuticals and are the first point of health care for approximately 60% of Nigerians.

MalariaCare will evaluate whether training and supervision of PPMVs in management of common childhood illnesses (malaria, diarrhea, and pneumonia) can substantially improve care and treatment on a population



Advocacy visit to Ebonyi State Ministry of Health with MalariaCare and ESMPIN teams. Photo credit: Kachi Amajour

basis without the use of subsidies for medications or the introduction of new types of providers. The pilot will utilize outlet surveys, household surveys, and provider competence measurements to evaluate outcomes, including the use of RDTs; respiratory timers; and proper case management of malaria, diarrhea, and pneumonia. The overall aim of the pilot is to help increase access to quality care for febrile illness through training and supervising local drug sellers on proper case management of febrile childhood diseases such as malaria, diarrhea, and pneumonia.

### **Key accomplishments**

The MalariaCare Nigeria team has worked to lay a solid foundation for pilot success in PY3. This past year, MalariaCare conducted two technical assistance visits to discuss the research design with stakeholders and finalize the pilot implementation site. After consultation with the NMCP and the USAID mission, Ebonyi State was chosen based on its long peak malaria transmission period, and because no other pilot projects focused on the private sector are currently being implemented. Within Ebonyi State, two local government areas are proposed to serve as the two intervention sites, with two other local government areas proposed as control sites. During the second technical assistance visit, the team finalized the pilot budget and further refined pilot design and evaluation plans.

“...PPMVs tend to treat a significant number of people who need health care...when your mandate captures such people, it brings recognition to this cadre of health care workers, increases their capacity, and improves health... Once we increase their capacity, we can bridge the gap of all level of health care...I would like to continue to partner with such programs.”

—Dr. Suny Nwangele, State Commissioner of Health, Ebonyi

After recruiting a field-based program coordinator and the baseline survey company to support the pilot, the program coordinator worked closely with the ESMPIN implementation team to conduct an advocacy visit with Ebonyi State health authorities, including the commissioner of health. Following the advocacy visit, Ebonyi’s commissioner of health and community members welcomed MalariaCare and were enthusiastic about the pilot intervention being implemented in their state. MalariaCare then finalized the pilot protocol, revised survey tools, and developed a subcontract with the local survey company. The pilot is expected to begin early in PY3.

### **Challenges**

Multiple private-sector activities are occurring in Nigeria, and it has been difficult to coordinate strategies and share tools. To help ensure that data collected from the pilot can be compared with other evaluations of private-sector contributions, MalariaCare is working to coordinate efforts through ACTwatch and PSI. The goal is to help ensure that household survey and outlet survey indicators from the pilot align with the indicators used for the ACTwatch survey conducted in 2012 as well as the ACTwatch survey planned for 2014.

### **Next steps**

The subcontract for Population Sampling International, the Nigerian survey company, has been approved and signed. MalariaCare’s program coordinator in Abuja is working with the survey company to prepare the survey tools. The protocol and survey tools will be submitted for IRB approval in Nigeria. Pending IRB review and approval by the National Health Research Ethics Committee in Nigeria, the baseline survey is scheduled to start in November 2014. MalariaCare, with support from PSI, is also developing the monitoring information system for monitoring and evaluation of the pilot.



## Tanzania

Tanzania is a new country for MalariaCare in PY2. Prior to confirmation of the financial obligation in April 2014, the MalariaCare team worked with PMI Tanzania to begin developing plans to assist the NMCP in strengthening case management services, including microscopy and RDT diagnostics, focusing on implementation of a QA program and building the capacity of the NMCP to lead QA activities in subsequent years.

### Key accomplishments

- Conducted an initial technical assessment and planning visit in February to meet with key malaria case management stakeholders—including the NMCP and National Institute of Medical Research in Tanzania—and visit health facilities in three regions. The information gathered during this visit was used to develop proposed activities for MalariaCare.
- Initiated recruitment of a project director, diagnostics experts, and several other key in-country positions.
- Negotiated a subagreement with the National Institute of Medical Research to fund an antimalarial therapeutic efficacy study to monitor for development of artemisinin resistance.
- Conducted a planning visit in June 2014 to work with the PMI Tanzania mission and NMCP on activity planning for MalariaCare and conduct site visits in the Kagera Region to gather lessons learned from the RDT QA modeling program being piloted there.
- Conducted a technical assistance visit in September to review planned MalariaCare activities with the PMI Tanzania mission and NMCP and to agree on implementation timelines.
- In consultation with the NMCP, MalariaCare developed a training plan and course curriculum. National trainers were also identified to lead the training of OTSS supervisors.

### Challenges

No significant challenges to report.

### Next steps

In PY3, MalariaCare's immediate task will be to finalize recruitment of the project director and other key staff and then begin implementation of an RDT and case management QA activities in five regions of the Lake Zone. The QA program will focus on cascade training of regional and district health management team staff, training of health facility staff, and on-site supervision or OTSS visits. Three more regions, in a zone yet to be determined, will be added to the QA program later in PY3. Given the challenge of collecting and effectively using data from up to 6,000 health facilities as the program expands across the country in continuing years, MalariaCare plans to pilot an electronic checklist data collection system. The purpose is to allow collection of individual health facility data and compare with national HMIS data, so that improvement interventions can be targeted to districts and individual health facilities. In addition to more effective short-term use of data, the new system will better allow long-term tracking and monitoring of project indicators, both in Tanzania and across project countries.

## Zambia

MalariaCare works across all ten provinces in Zambia to strengthen malaria case management. In

PY2, the project focused on strengthening and consolidating the malaria case management QA system through OTSS and several new key initiatives: training additional clinical supervisors, continuing development of a national microscopy training slide set, and developing a national microscopist accreditation course. MalariaCare also worked to improve clinical capacity to manage cases that present with fever but test negative for malaria. The project expanded OTSS coverage to additional health facilities, improved data collection tools for decision-making, and enhanced the functionality of the national malaria QA system by engaging provincial and district health management teams in planning and budgeting for OTSS, thereby facilitating local ownership and sustainability.

## Key accomplishments

*Objective 1: The accuracy of diagnostic testing for malaria is improved to greater than 90%.*

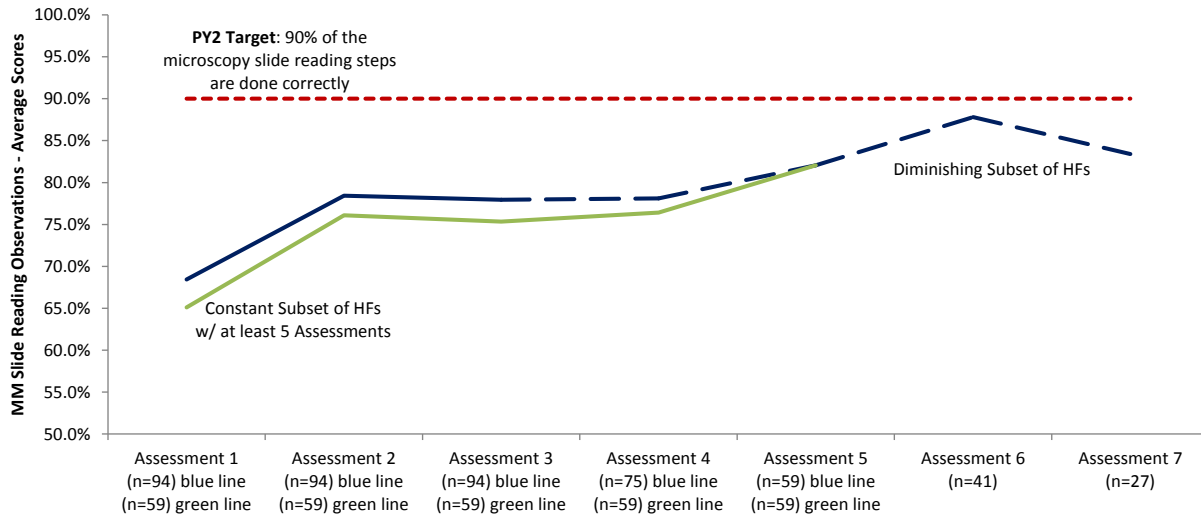
- Developed an outline for the National Malaria Microscopy Accreditation Program. The program is designed to accredit basic- and advanced-level microscopist skills. Target groups include a core group of national/provincial-level microscopy trainers, OTSS supervisors, reference-level microscopists, and health facility practicing microscopists. The first course tested 21 senior laboratory staff and the results are under review.
- Revised the laboratory OTSS checklist to improve the quality of monitoring and mentoring support. The checklist will be reformatted for use on a tablet, allowing for additional components such as individualized health facility action plans. In addition, data and action points collected during prior visits can now be updated in real time, ensuring that updated checklist data is available during subsequent OTSS visits.
- Worked with the National Malaria Control Center to develop a NAMS protocol. The protocol is under review by a Zambia ethics committee and subagreement development is moving forward. Slide set development is anticipated to begin in Quarter 2 of PY3.
- MalariaCare completed three rounds of combined clinical and laboratory OTSS (rounds 11, 12, and 13), providing mentoring for malaria diagnostics and treatment for more than 400 health workers. In general, health facilities enrolled in the OTSS program are reaching or approaching program targets, including the key goals for malaria microscopy slide reading, RDT performance, and compliance to negative test results.



OTSS visit, Lusaka, Zambia.  
Photo credit: Timothy Nzangwa

Some targets are proving more difficult to reach than others. For example, among the total health care workers receiving training during OTSS, only 54.3% of them meet the QA threshold ( $\geq 90\%$  compliance with checklist) for competent microscopy preparation and reading. Figure 14 shows an overall improvement in slide reading performance, nearly meeting the threshold after six OTSS visits with an average gain of over 30% in slide reading scores between visits 1 and 6 (blue line). Although visit 7 shows a dip in performance, this appears to be due to a subset of ten poorly performing health facilities. The other 17 health facilities had scores equal to or greater than scores obtained in visit 6. The cause of decline in these ten facilities is unknown, but may be due to staff turnover, and is being further investigated. The general improvement trend is confirmed in a subset of 59 health facilities that have received five consecutive assessments (green line), but will need to be confirmed as these facilities receive their sixth and seventh visits. Moving forward, MalariaCare will use this information to prioritize targeted interventions toward poorly performing health facilities.

Figure 14: Malaria microscopy slide reading performance.

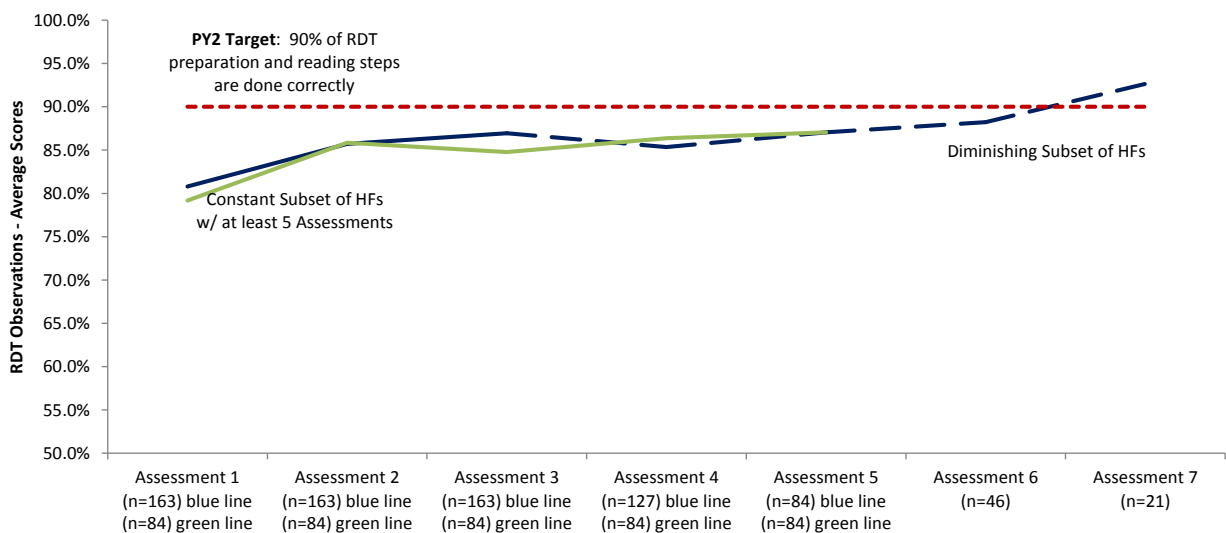


Note: HF=health facility; PY2=project year two. The true trends for the presented subsets of HFs are represented by solid lines; the dotted lines show trends for the same facilities from the original subset for which data points were available. The drop in the N values at these points in the graphs represent lags in assessment scores and, as OTSS pushes forward, facility assessment scores will become increasingly available to fill in the gaps.

*Objective 2: Increased percentage of patients suspected to have malaria or a febrile illness who receive a diagnostic test for malaria.*

- Since the inception of OTSS, 162 health facilities have been enrolled in the program. Overall, there has been steady improvement in the quality of malaria diagnostic capacity and compliance to test results. For example, when assessing RDT use, health facilities on average show a steady improvement in performance against a checklist, reaching the target of 90% compliance on average at approximately 6.5 visits (blue line). The trend is confirmed, but not yet reached in a subset of 84 health facilities that have received at least five consecutive on-site assessments (green line).

Figure 15. Health worker RDT performance over successive OTSS rounds.

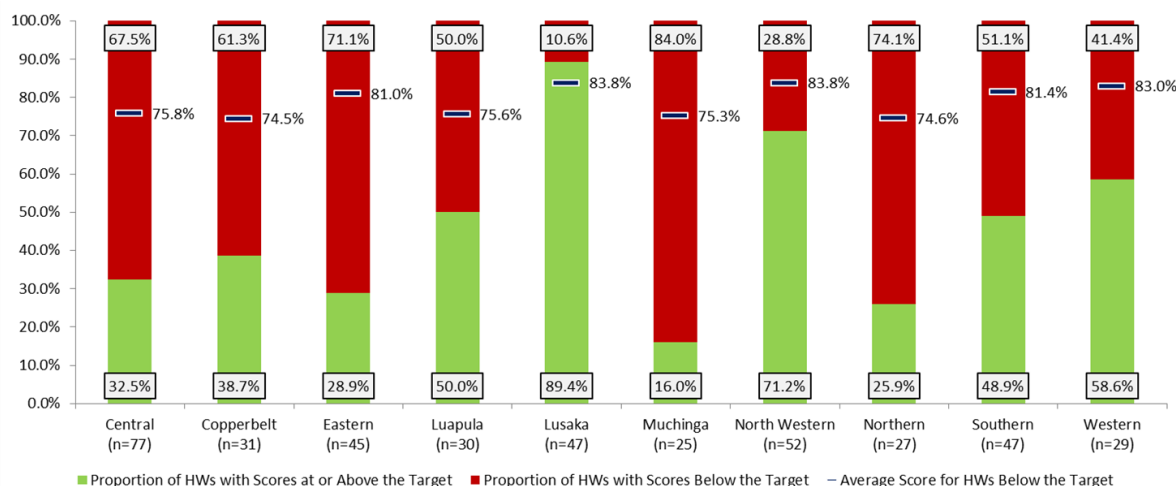


Note: RDT=rapid diagnostic test; OTSS=outreach training and support supervision; HF=health facility. The true trends for the presented subsets of HFs are represented by solid lines; the dotted lines show trends for the same facilities from the original

subset for which data points were available. The drop in the N values at these points in the graphs represent lags in assessment scores and, as OTSS pushes forward, facility assessment scores will become increasingly available to fill in the gaps.

Figure 15 shows RDT performance for individual health workers from the most recent OTSS round (round 12). Performance varies significantly by province. The green bars represent the percentage of health care workers who were able to perform above the 90% threshold on RDT preparation and reading. The red bars represent the percentage of health care workers who were not able to meet the 90% threshold, and the blue lines indicate the average score for those who were not able to meet the 90% threshold. As Figure 16 below shows, the means vary between 75.3% and 83.8% (with overall ranges between 53.8% and 88.5%) with no significant differences between the medians and means, which demonstrates that even the poorer performing group of providers are reaching a reasonably good performance level in preparation and use of RDTs across all provinces.

Figure 16. Health worker RDT performance.



Note: PY2=project year two; PMP=performance monitoring plan; RDT=rapid diagnostic test; HF=health facility.

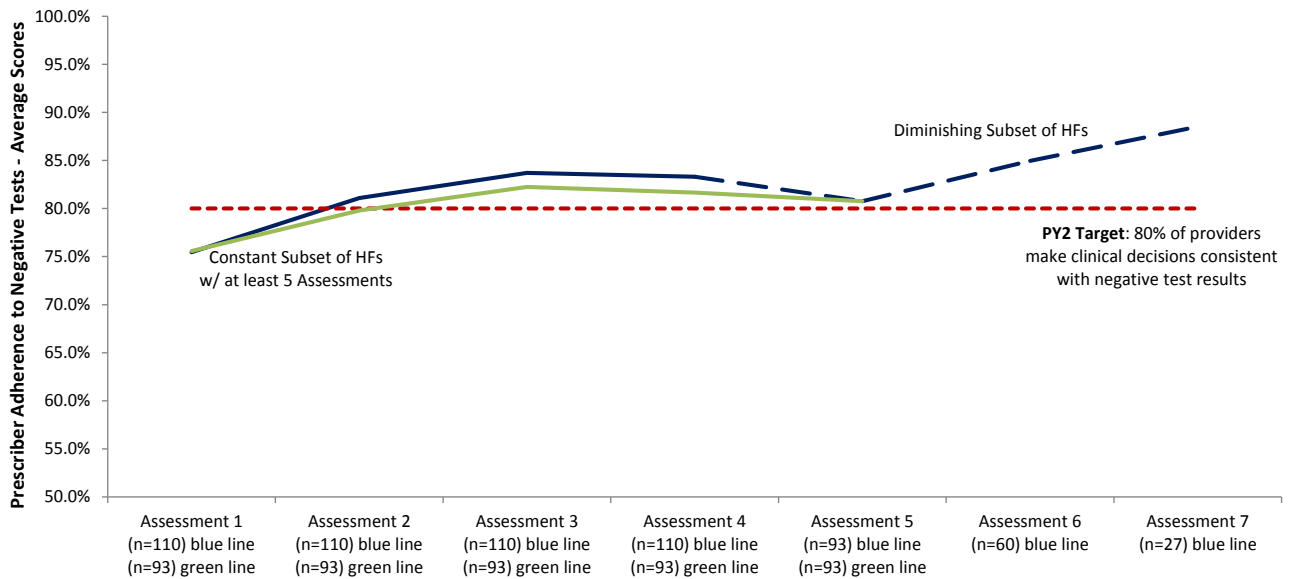
- In addition to OTSS, MalariaCare coordinated RDT QA activities in the 27 Zambia Integrated Systems Strengthening Program (ZISSP)-supported districts and in health facilities that receive routine MalariaCare OTSS support. The project engaged provincial and district health management teams from the MOH and the Ministry of Community Development and Mother and Child Health (MCDMCH) to encourage them to plan and budget for upcoming OTSS rounds. Several teams have now included OTSS activities in their action plans and budgets. MalariaCare also supported a lessons learned workshop for 27 provincial OTSS supervisors and clinical care experts where information from the latest OTSS visit was shared and action plans were determined by supervisors to address specific challenges.

*Objective 3: Increased percentage of patients who receive appropriate treatment for malaria or other febrile illness consistent with the result of the diagnostic test.*

- Printed and distributed 200 copies of algorithm charts for severe and uncomplicated malaria and non-malaria febrile illnesses in collaboration with the National Malaria Control Centre (NMCC)/MOH.
- Revised clinical pre-service training curriculum to align with WHO standards.
- While Zambia started from a relatively high level of compliance to malaria test results—75.5% (baseline adherence is much lower in general in other MalariaCare project countries)—there has been slow and steady improvement during the implementation of OTSS. Figure 17 shows the average trend with provider compliance to test results (from both RDTs and laboratory-based microscopy). The blue line represents the complete dataset, and shows that health facilities maintain high compliance out to seven assessments. In a subset of 93 health facilities that have received five consecutive assessments for this indicator (green line), the general trend is also maintained at a high level and over the 80% compliance with the checklist threshold. MalariaCare will continue to push compliance in health facilities to higher targets, and in the future will monitor compliance to both negative and positive test results.

“MalariaCare has been providing on-site technical assistance on management of malaria and other febrile disease. This has helped me broaden my understanding that not all febrile diseases are malaria cases. Febrile patients who don't have malaria benefit tremendously from first ruling out malaria with a diagnostic test. Also, in line with mentorship at this health center, anti-malaria drugs are usually not issued to patients before being screened for the disease, which is in line with the new policies of Ministry of Health.” —Clinician, Chelstone Health Center, Lusaka, Zambia.

Figure 17: Provider adherence to negative test results over successive OTSS rounds.

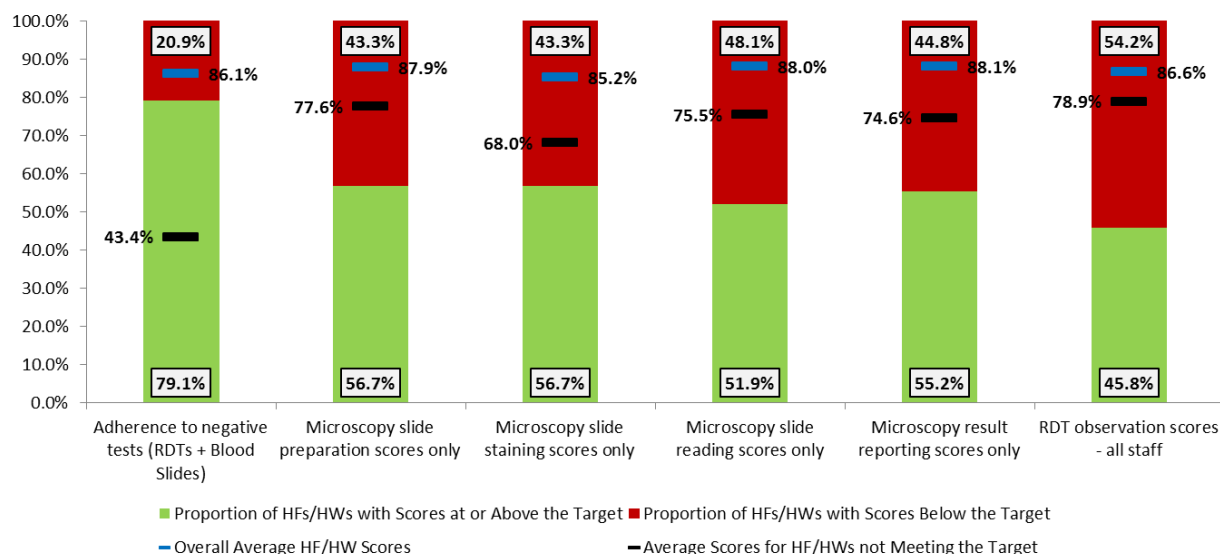


The true trends for the presented subsets of HF are represented by solid lines; the dotted lines show trends for the same facilities from the original subset for which data points were available. The drop in the N values at these points in the graphs represent lags in assessment scores and, as OTSS pushes forward, facility assessment scores will become increasingly available to fill in the gaps.

*Objective 4: Strengthened laboratory systems at the country level for detecting malaria and other infectious diseases.*

- Worked with the MOH/NMCC, MCDMCH, and PMI to develop a Zambian-focused national malaria case management QA framework.
- Standardized malaria laboratory registers across OTSS-supported health facilities. These registers include laboratory serial numbers to help streamline monthly reporting and disaggregates data by sex and age. Other features on these register include more detailed patient information, test results, staff that completed the test, and expiry dates for RDTs, if applicable.
- Refined OTSS strategy through lessons learned workshops and advocated for OTSS focused on underperforming health facilities. Figure 18 represents a snapshot for performance of key indicators across all OTSS enrolled health facilities. These figures represent health facility scores, as a composite of individual scores and record reviews rather than individual health worker scores. Although average scores (represented by the blue bars) are high, there are significant gains to be made in improving performance to target levels. The black bars show the average score for those facilities that did not make the indicator target thresholds. This analysis shows that there is significant underperformance in adherence to negative test results and in microscopy slide staining in the underperformers, and indicate areas that need more focused mentoring. The review of these indicators in lessons learned workshops and subsequent targeting of underperforming health facilities is expected to lead to improvement for those facilities most in need.

Figure 18: Key performance indicators of health facilities undergoing OTSS.



Note: PY2=project year two; PMP=performance monitoring plan; HF=health facility.

### Challenges

The project has encountered delays in conducting analysis of OTSS data due to the time it takes to manually enter data from a paper checklist. To address this, MalariaCare will continue working to transition to an electronic data collection platform in Zambia.

Logistical challenges, such as limited availability of MOH vehicles, scheduling conflicts with other health facility monitoring activities, and competing priorities for OTSS supervisors have contributed to delayed

OTSS related health facility visits. To address this, MalariaCare will work with the provincial and district health management teams, the NMCC, and the MCDMCH to further institutionalize malaria case management OTSS into their scheduled activities.

Expansion of malaria case management OTSS to lower-level health facilities, particularly at the subdistrict level, has been hindered by the high cost of per diems in Zambia. Providing regular on-site visits would help to assure quantity and quality of testing and appropriate treatment of suspected cases.

### **Next steps**

MalariaCare will continue to support national efforts to improve management of malaria and other febrile illness and to strengthen diagnostic capacity in large health centers with laboratories and hospitals. In PY3, MalariaCare will work to decentralize malaria case management.

MalariaCare plans to:

- Implement the national malaria diagnostics QA framework by training district health teams in select provinces to perform OTSS QA visits to lower-level health facilities.
- Help accredit microscopist trainers and health facility supervisors in line with national and WHO standards.
- Expand joint laboratory and clinical OTSS to include the majority of district hospitals and health centers that have laboratories with in-patient admission capacity.
- Continue to provide OTSS support to health facilities with laboratories as well as expand support to poorly performing health facilities. Improve effectiveness and timeliness of data collection and use for decision-making by using a revised and more targeted checklist to better address indicators of improved case management. In addition, MalariaCare will pilot use of an electronic data collection and analysis platform in one province, with planned rollout to the rest of the country early in PY4.

# Appendix A: Performance monitoring plan

## Democratic Republic of Congo

Objective 1: The accuracy of diagnostic testing for malaria is improved to greater than 90%.

\* marks indicators that will be disaggregated by sex

### Outputs

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status / values	Gaps analysis/notes
1.a*	Number of participants in lessons learned workshops.	Number of participants in lessons learned workshops.	1.1	Clear and disseminated laboratory guidelines and supervision structures.	Activity reports	Semi-annually	20	19	19 participants attended the lessons learned workshops.
1.b	Outreach training and support supervision (OTSS) checklist revised.	OTSS checklist revised.	1.2	Clear and disseminated laboratory guidelines and supervision structures.	Activity reports	Semi-annually	Revised checklist meets global standards	Completed	Target reached.
1.c	Number of bench aids printed and distributed.	Number of training manuals printed and distributed to provincial National Malaria Control Program (PNLP) entities.	1.3	Clear and functioning quality assurance (QA) procedures for regulation of diagnostics for malaria.	Activity reports	Semi-annually	100	150	Target exceeded.
1.d	Number of OTSS visits conducted.	Number of OTSS visits conducted at targeted laboratories. Total number including all rounds of OTSS at each facility.	1.4	Clear and disseminated laboratory guidelines and supervision structures.	OTSS activity reports	Semi-annually	45	44	The final round of laboratory OTSS began in September and continued in PY3.
1.e*	Number of malaria diagnostic refresher training (MDRT)	Number of laboratory technicians trained in MDRTs.	1.5	Providers demonstrate competence in rapid diagnostic tests (RDTs) and/or microscopy.	Activity reports	Semi-annually	15	<u>17 total</u> 11 male 6 female	17 laboratory technicians (re)trained in malaria diagnostics.



Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status / values	Gaps analysis/notes
	participants trained (advanced).								
1.f	Percentage of targeted facilities with at least one provider formally trained in RDTs in the past 12 months.	Number of targeted facilities with one or more providers formally trained in RDTs in the past 12 months /total number of targeted facilities.	1.4	Providers demonstrate competence in RDTs and/or microscopy.	OTSS activity reports	Semi-annually	80%	80%	Target reached; 12 out of the 15 OTSS sites for which data are available for this report had at least one provider formally trained in RDTs. Results derived from laboratory OTSS database.
1.g	Percentage of targeted facilities with at least one provider formally trained in malaria microscopy in the past 12 months.	Number of targeted facilities with one or more providers formally trained in malaria microscopy in the past 12 months/total number of targeted facilities.	1.4	Providers demonstrate competence in RDTs and/or microscopy.	OTSS activity reports	Semi-annually	80%	80%	Target reached; 12 out of the 15 OTSS sites for which data are available for this report had at least one provider formally trained in malaria microscopy. Results derived from laboratory OTSS database.
1.h*	Percentage of targeted providers who received training by supervisors on documented diagnostic errors during the reporting period.	Number of providers who received training by supervisors on documented diagnostics errors (according to team supervision reports) during the reporting period/total number of providers with documented errors in diagnostics during team supervision during the reporting period.	1.4	Providers demonstrate competence in RDTs and/or microscopy.	OTSS activity reports	Semi-annually	80%	<u>70 total</u> 42 male 28 female	Unable to calculate percentages. Results reflect the total number of on-the-job trainings provided by supervisors for RDT and/or microscopy.
1.o*	Percentage of targeted laboratory technicians trained in RDTs.	Number of laboratory technicians trained in RDTs/total number of targeted laboratory technicians.	1.1	Providers demonstrate competence in RDTs and/or microscopy.	OTSS activity reports	Semi-annually	80%	<u>100%</u> 15 male 10 female	Target reached; 24 trainings were expected, 25 occurred.

**Intermediate outcomes**

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status / values	Gaps analysis/notes
1.i	Percentage of targeted countries with national malaria diagnostics supervision tools whose indicators adhere to global standards.	Number of targeted countries whose national malaria diagnostics supervision tools adhere to global standards/total number of targeted countries.	1.2	Clear and disseminated laboratory guidelines and supervision structures.	Activity reports	Semi-annually	OTSS supervision tools adhere to global standards.	Completed	Target reached.
1.j*	Percentage of targeted laboratory technicians demonstrating competence in RDT.	Number of targeted laboratory technicians who score 90% or greater on supervisory checklists measuring the preparation and reading of the malaria RDTs demonstrating competence in RDTs/total number of laboratory staff who received a supervisory visit during the reporting period.	1.4	Providers demonstrate competence in RDTs and/or microscopy.	OTSS activity reports	Semi-annually	90%	29.4% met the 90% target or above, with an average score of 84.2%	Target not reached; only 5 out of 17 observed laboratory staff performed at 90% or greater with respect to RDT use; unable to disaggregate by sex.
1.k*	Percentage of targeted laboratory technicians demonstrating competence in malaria microscopy.	Number of targeted laboratory technicians who score 90% or greater on supervisory checklist measuring slide preparation and parasite detection/total number of laboratory technicians who received a supervisory visit during the reporting period.	1.4	Providers demonstrate competence in RDTs and/or microscopy.	OTSS activity reports	Semi-annually	90%	30% met the 90% target or above, with an average score of 83.6%	Target not reached; only 9 out of 30 observed laboratory staff performed at 90% or greater with respect to malaria slide preparation, staining, and reading; unable to disaggregate by sex.

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status / values	Gaps analysis/notes
1.l*	Percentage of targeted clinicians demonstrating competence in RDTs.	Number of targeted clinicians who score 90% or greater on supervisory checklists measuring the preparation and reading of the malaria RDTs demonstrating competence in RDTs/total number of clinical staff who received a supervisory visit during the reporting period.	1.4	Providers demonstrate competence in RDTs and/or microscopy.	OTSS activity reports	Semi-annually	90%	--	Clinical supervision began in September 2014; results have not yet been compiled.
1.m	Percentage of targeted clinics that meet standards (including appropriate materials, documentation, and qualified staff) for high-quality diagnosis of malaria.	Number of targeted clinics that meet 90% or greater on facility checklists for diagnosis during supervisory visits/total number of targeted facilities that received a supervisory visit during the reporting period.	1.4	Providers demonstrate competence in RDTs and/or microscopy.	OTSS activity reports	Semi-annually	90%	--	Clinical supervision began in September 2014; results have not yet been compiled.
<b>Objective 2: Increased percentage of patients suspected to have malaria or febrile illness who receive a diagnostic test.</b>									
<b>Outputs</b>									
2.a	Develop pilot study protocol for RDT in the private retail sector based on feasibility study results.	Develop pilot study protocol for RDT in the private retail sector based on feasibility study results.	2.1	Private facilities are linked with the public sector.	Activity reports	Semi-annually	Pilot protocol developed		After initial screening visit by Population Services International (PSI), MalariaCare decided to put further private-sector case management work on hold until the PSI and the Clinton Health Access Initiative Kinshasa private-sector studies are done.

**Objective 3: Increased percentage of patients who receive appropriate treatment for malaria or other febrile illnesses-consistent with the diagnostic test.**

**Outputs**

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status / values	Gaps analysis/notes
3.a	Percentage of targeted facilities receiving at least two clinical supervisory visits per annum for malaria treatment.	Number of facilities receiving at least two clinical supervisory visits per annum for malaria treatment with World Health Organization (WHO)-recommended artemisinin-based combination therapy (ACTs)/total number of targeted facilities.	1.4	Health care providers demonstrate competence in malaria treatment.	Activity reports	Annually	100%	0%	Three rounds of clinical OTSS were anticipated, but due to difficulties aligning schedules with national partners, the clinical OTSS component was delayed.
3.b*	Percent of targeted clinicians trained in case management refresher training.	Percent of targeted clinicians trained in case management refresher training.	3.1	Health care providers demonstrate competence in malaria treatment.	Activity reports	Semi-annually	100%	<b>100%</b> 9 male 8 female	17 clinicians were (re)trained in febrile illness case management.
3.c*	Percentage of targeted clinical supervisors trained in supervision for malaria treatment.	Number of targeted clinical supervisors trained in supervision for clinical case management of febrile illnesses/Number of targeted clinical supervisors.	3.2	Country has supervisory structures and implementation of supervision for malaria treatment.	OTSS activity reports	Semi-annually	100%	<b>100%</b> 9 male 8 female	17 clinicians were trained as OTSS supervisors for malaria case management.
3.e*	Percentage of targeted providers who received training in malaria treatment by supervisors during the reporting period.	Number of providers who received training in malaria treatment by supervisors based on documented errors during the reporting period/total number of providers who had documented errors during team supervision during the reporting period.	1.4	Health care providers demonstrate competence in malaria treatment.	OTSS activity reports	Semi-annually	70%	--	Clinical supervision began in September 2014; results have not yet been compiled.

**Intermediate outcomes**

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status / values	Gaps analysis/notes
3.f	Percentage of targeted clinics that meet standards (including appropriate materials, documentation, and qualified staff) for high-quality treatment of malaria.	Number of targeted clinics that meet 90% or greater on facility checklists during supervisory visits/total number of targeted facilities that received a supervisory visit during the reporting period.	1.4	Health care providers demonstrate competence in malaria treatment.	Activity reports	Semi-annually	80%	--	Clinical supervision began in September 2014; results have not yet been compiled.
3.g*	Percentage of providers demonstrating competence in identifying suspected malaria cases according to global standards.	Number of providers who demonstrate correct procedures for differential diagnosis of possible malarial symptoms during team supervision observation/total number of providers targeted for team supervision during the reporting period.	1.4	Health care providers demonstrate competence in malaria treatment.	Activity reports	Semi-annually	70%	--	Cannot be derived from OTSS data using current platform.
3.h*	Percentage of providers demonstrating competence in testing suspected patients for malaria.	Number of providers who appropriately order or perform testing of suspected malaria patients during team supervision observations/total number of providers targeted for team supervision observations during the reporting period.	1.4	Health care providers demonstrate competence in malaria treatment.	Activity reports	Semi-annually	70%	--	Cannot be derived from OTSS data using current platform.

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status / values	Gaps analysis/notes
3.i*	Percentage of targeted providers demonstrating compliance to treatment with WHO-recommended ACT for cases with positive malaria test results.	Number of providers who comply with treatment with a WHO-recommended antimalarial for cases with positive malaria test results during clinical assessment visits measured through direct observation during team supervision visits/total number of providers who received team supervision during the reporting period.	1.4	Health care providers demonstrate competence in malaria treatment.	Activity reports	Semi-annually	70%	--	Cannot be derived from OTSS data using current platform.
3.j*	Percentage of providers demonstrating adherence to negative test results according to global standards.	Number of providers demonstrating adherence to negative test results during team supervision measured through direct observation during team supervision visits/total number of providers who received team supervision during reporting period.	1.4	Health care providers demonstrate competence in malaria treatment.	Activity reports	Semi-annually	70%	25.4%	Target not reached; only 31 out of 122 clinician records reviewed at the time of the most recent OTSS visits showed adherence to negative test results with respect to prescription practices; unable to disaggregate by sex.

**Objective 4: Strengthened laboratory systems at the country level for detecting malaria and other infectious diseases.**

**Outputs**

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status / values	Gaps analysis/notes
4.a	Establish a coordinated malaria diagnostic training and supervision plan, including QA/AQ and monitoring and evaluation (M&E).	Plan for coordination of malaria diagnostics with a unified training, supervision, and M&E plan.	4.1	Reference laboratories and facilities able to provide high-quality diagnostics for malaria and other febrile illness.	Activity reports	Semi-annually	National Malaria Control Program (NMCP) approved plan for training, supervision, and M&E.	Partially completed	MalariaCare, the NMCP, B8, and in-country implementing partners have drafted a QA guide for malaria diagnostics; document is under central review and will be finalized in PY3.
4.b	Number of coordination meetings conducted with diagnostic partners.	Meetings conducted with in-country partners for planning and coordination of malaria diagnostics.	4.1	Country has full national policies for malaria treatment.	Activity reports	Semi-annually	3	3	Target reached; multiple coordination meetings have been held with the NMCP, B8 and in-country implementing partners, namely, the United States President's Malaria Initiative Expansion Project (PMI-EP). Focus was on finalization of the national archive of malaria slides (NAMS) protocol, the QA guidelines for malaria diagnostics, and supervision tools.

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status / values	Gaps analysis/notes
4.c	In-country NAMS protocol developed for malaria microscopy QA and submitted to the relevant institutional review boards (IRBs).	Development of a protocol and submission of the protocol for NAMS for conducting malaria microscopy QA.	4.3	Reference laboratories and facilities able to provide high-quality diagnostics for malaria and other febrile illness.	Activity reports	Semi-annually	Protocol developed and submitted to relevant IRBs.	Partially completed	Protocol has been developed and reviewed. It will be submitted to the local IRB at the beginning of PY3; a number of NAMS activities have been pushed to PY3 including procurement of supplies, training of dedicated NAMS staff, and sample collection.
4.d	Number of people trained from the INRB/PNLP on NAMS.	Number of people trained from the INRB/PNLP on how to assemble a NAMS.	4.3	Reference laboratories and facilities able to provide high-quality diagnostics for malaria and other febrile illness.	Activity reports	Semi-annually	10	--	Target not yet reached; activity has not yet occurred.
4.e	Number of targeted facilities participating in the United Kingdom National External Quality Assessment Service (UK NEQAS) microscopy proficiency program.	Number of targeted facilities having received slides from the UK NEQAS program and having submitted results to the National Reference Laboratory (NRL).	4.2	Reference laboratories and facilities able to provide high-quality diagnostics for malaria and other febrile illness.	Activity reports	Semi-annually	6	6	Target reached.



Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status / values	Gaps analysis/notes
4.f	Percentage of targeted laboratories that meet global standards for high-quality malaria diagnostics.	Number of targeted laboratories that meet 90% or greater on re-checking of malaria slides during supervisory visits/total number of targeted laboratories who received a supervisory visit during the reporting period.	1.4	Reference laboratories and facilities able to provide high-quality diagnostics for malaria and other febrile illness.	OTSS activity reports	Semi-annually	80%	78.6% met the 80% target or above, with an average score of 92.0%	11 out of the 14 OTSS sites for which data are available had 90% or greater agreement on malaria slide re-checking compared to OTSS supervisor results.
4.g	Percentage of targeted facilities receiving at least two laboratory supervisory visits per annum.	Number of facilities receiving at least two laboratory supervisory visits per annum/total number of targeted facilities.	1.4	Reference laboratories and facilities able to provide high-quality diagnostics for malaria and other febrile illness.	Activity reports	Annually	100%	100%	Target achieved; 15 out of the targeted 15 facilities have received two supervisory visits via laboratory OTSS.

# Ghana

## Objective 1: The accuracy of diagnostic testing for malaria is improved to greater than 90%.

### Outputs

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status/values	Gaps analysis/notes
1.a	Laboratory supervision checklist updated.	Laboratory supervision checklist updated with input from stakeholders.	1.2	Country has supervisory structures for the implementation of supervision for malaria diagnosis.	Activity reports	Semi-annually	Checklist revised	Complete	Target reached. Revised checklist used during PY2 laboratory OTSS.
1.b	PT program developed.	PT program developed including an operations manual, storage unit, and PT protocols.	1.3	Clear and functioning QA procedures for regulation of diagnostics for malaria and other IDs.	Activity reports	Semi-annually	PT program established	Complete	Target reached. Completed and used during PY2 LAB OTSS.
1.c*	Number of laboratory supervisors attending an OTSS lessons learned workshop.	Number of laboratory supervisors who attended an OTSS lessons learned workshop.	1.4	Country has supervisory structures for the implementation of supervision for malaria diagnosis.	Activity reports	Semi-annually	30	68	Target exceeded.
1.d	Number of revised laboratory registers printed and distributed.	Number of revised laboratory registers printed and distributed to health facilities.	1.5	Clear and disseminated laboratory guidelines, procurement policies, and supervision structures.	Activity reports	Semi-annually	2,000	3000	Target exceeded.
1.e	Full WHO endorsement of Ghana NAMS.	Full WHO endorsement of the NAMS for conducting malaria microscopy QA.	1.6	Clear and functioning QA procedures for regulation of diagnostics for malaria and other IDs.	Activity reports	Semi-annually	WHO endorsement received	Ongoing	Activity has not yet been completed. Slides are currently undergoing PCR validation at Kintampo.

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status/values	Gaps analysis/notes
1.f*	Number of participants trained in MDRT.	Number of participants trained in MDRT.	1.7, 1.8	Providers demonstrate competence in RDTs and microscopy.	Activity reports	Semi-annually	220	265	Target exceeded.
1.g	Develop a national-level accreditation program.	Develop a national-level accreditation program for expert microscopists.	1.9	Clear and functioning QA procedures for regulation of diagnostics for malaria and other IDs.	Activity reports	Semi-annually	Plan and training guidelines for accreditation program developed	Ongoing	Draft accreditation curriculum developed. Awaiting final approval by Allied Health Council.
1.h	Report on PSI private-sector assessment.	Report on PSI private-sector assessment.	1.10	Providers demonstrate competence in RDTs and microscopy.	Activity reports	Semi-annually	PSI private-sector report submitted to stakeholders	Complete	Target reached. Initial assessment report submitted. PMI has no interest in further MalariaCare private-sector work.
1.i*	Percentage of targeted laboratory supervisors trained in supervision for laboratory diagnosis of malaria.	Number of supervisors trained in supervision for laboratory diagnosis of malaria/total number of targeted laboratory supervisors.	1.7, 1.8	Country has supervisory structures for the implementation of supervision for malaria treatment.	Activity reports	Semi-annually	90%	100%	Target exceeded. 20 out of 20 targeted supervisors received training.
1.j	Percentage of targeted facilities with at least one provider trained in RDTs.	Number of targeted facilities with one or more providers trained in RDT/total number of targeted facilities.	2.1	Providers demonstrate competence in RDTs and microscopy.	Activity reports	Semi-annually	90%	88%	1,321 of 1,500 facilities.
1.k	Percentage of targeted communities with at least one community based agent (CBA) trained in RDTs.	Number of targeted communities with at least one CBA trained in RDTs/total number of targeted communities.	2.1	Providers demonstrate competence in RDTs and microscopy.	Activity reports	Semi-annually	75%		This activity was not planned for PY2 (removed from initial proposal).

Intermediate outcomes									
Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status/values	Gaps analysis/notes
1.l	Country has national laboratory supervision tools with indicators adhering to global standards for determining possible malaria cases.	Country has national laboratory supervision tools with indicators adhering to global standards for determining possible malaria cases.	1.1	Providers demonstrate competence in ordering/conducting malaria diagnostic tests for suspected cases.	Activity reports	Semi-annually	Laboratory supervision tools adhere to global standards	Complete	Target reached.
1.m*	Percentage of targeted laboratory technicians demonstrating competence in RDTs.	Number of targeted laboratory technicians who score 90% or greater on the MDRT posttest/total number of laboratory staff who completed the MDRT course.	1.7	Providers demonstrate competence in RDTs and microscopy.	Activity reports	Semi-annually	90%	70.4%	Target not reached. Mean score 93%. 429 observations. 91.84% of participants scored greater than 80%.
1.n*	Percentage of targeted laboratory technicians demonstrating competence in malaria microscopy.	Number of targeted laboratory technicians who score 90% or greater on the MDRT posttest/total number of laboratory staff who completed the MDRT course.	1.7	Providers demonstrate competence in RDTs and microscopy.	Activity reports	Semi-annually	90%	48.6%	Target not reached. Mean score 73%. 245 observations.  See Table 3 in narrative for performance by region.

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status/values	Gaps analysis/notes
1.o*	Percentage of targeted clinical providers who demonstrate competence in RDTs.	Number of targeted clinical providers who score 90% or greater on supervisory checklists on preparation and reading of the malaria RDTs/total number of clinical providers who received a supervisory visit during the reporting period.	2.1	Providers demonstrate competence in RDTs.	Activity reports	Semi-annually	90%	54%	Target not reached. Mean score 89%. 2,379 observations. 84.21% of participants scored greater than 80%.
1.p*	Percentage of targeted trained CBAs that demonstrate competence in RDTs.	Number of targeted trained CBAs that demonstrate competence in RDTs/total number of CBAs.	2.11, 2.12	Providers demonstrate competence in RDTs.	Activity reports	Semi-annually	80%		This activity was not planned for PY2 (removed from initial proposal).
1.q*	Percentage of laboratory supervisors demonstrating competence in malaria microscopy.	Percentage of laboratory supervisors who score 90% or greater in slide preparation and parasite detection during the training-of-trainers (TOT) posttest/total number of laboratory supervisors who completed a posttest during a TOT.	1.8	Providers demonstrate competence in RDTs and/or microscopy.	Activity reports	Semi-annually	90%	65%	Target not reached. Mean score 91.5%. 20 supervisors. 90% scored 80% and greater.

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status/values	Gaps analysis/notes
1.r*	Percentage of laboratory supervisors demonstrating competence in RDTs.	Percentage of laboratory supervisors who score 90% or greater in preparation and reading of RDTs during the TOT posttest/total number of laboratory supervisors who completed a posttest during a TOT.	1.8	Providers demonstrate competence in RDTs and/or microscopy.	Activity reports	Semi-annually	90%	100%	Target exceeded.
1.s*	Percentage of clinical supervisors demonstrating competence in RDTs.	Percentage of clinical supervisors who score 90% or greater in preparation and reading of RDTs during the TOT posttest/total number of clinical supervisors who completed a posttest during a TOT.	2.6, 2.7	Providers demonstrate competence in RDTs.	Activity reports	Semi-annually	90%	53%	Target not reached. Mean score 89%. 84.29% of participants scored greater than 80%. Target appears low as supervisors to perform at a high level (i.e., score 90% and greater to be considered competent). Clinical supervisors to be retrained on RDT use in PY3.
1.t*	Percentage of CBA supervisors demonstrating competence in RDTs.	Percentage of CBA supervisors who score 90% or greater in preparation and reading of RDTs during the TOT posttest/total number of CBA supervisors who completed a posttest during a TOT.	2.8	Providers demonstrate competence in RDTs and/or microscopy.	Activity reports	Semi-annually	90%	48.53%	Target not reached. Mean score 89.2%. 88% of 509 CBA supervisors scored greater than 80%. Reason same as in above. Retraining of supervisors required in PY3.

**Objective 2: Scale up and improve access and availability to high-quality malaria treatment with focus on the lower health facility level.**

**Outputs**

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status/values	Gaps analysis/notes
2.a	Number of clinical OTSS visits conducted.	Number of clinical OTSS visits conducted in seven regions.	2.1	Providers demonstrate competence in malaria treatment.	Activity reports	Semi-annually	4,500	3786	Target not reached. Round 2 OTSS data entry is ongoing and final figure will be higher.
2.b	Update supportive supervision policy and guidelines.	Update supportive supervision policy and guidelines.	2.2	Country has supervisory structures for the implementation of supervision for malaria treatment.	Activity reports	Semi-annually	Supportive supervision policy and guidelines updated	Ongoing	Stakeholders meeting held to develop framework. Awaiting consultant to draft policy together with Ghana Health Service (GHS) (there was no initial policy to be updated).
2.c	Clinical supervision checklist updated.	Clinical supervision checklist updated with input from stakeholders.	2.3	Country has supervisory structures for the implementation of supervision for malaria treatment.	Activity reports	Semi-annually	Checklist revised	Complete	Target reached.
2.d	Number of clinical supervisors attending regional lessons learned workshop.	Number of clinical supervisors attending regional lessons learned workshop.	2.4	Country has supervisory structures for the implementation of supervision for malaria treatment.	Activity reports	Semi-annually	28	168	Target exceeded.

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status/values	Gaps analysis/notes
2.e	GHS/NMCP national malaria case management policy guideline printed and disseminated.	Print and disseminate GHS/NMCP national malaria case management policy guidelines.	2.5	Providers demonstrate competence in case management (use of the guidelines measured through supportive supervision assessments of competence and related indicators).	Activity reports	Semi-annually	1,700 policy guidelines; 6,000 job aids; 6,000 flow charts	10,000 policy guidelines; 6,000 job aids; 28,000 flow charts	Target reached. Printings completed, distribution ongoing.
2.f*	Number of regional- and district-level participants in case management supervision training.	Number of regional- and district-level participants in competency-based training for supervisors in case management.	2.6, 2.7	Country has supervisory structures for the implementation of supervision for malaria treatment.	Activity reports	Semi-annually	30 for regional; 168 for district	220	Target exceeded.
2.g	Number of districts with case management at community level.	Number of districts with case management at community level.	4.1	Providers demonstrate competence in case management.	Activity reports	Semi-annually	15		This activity was not planned for PY2 (removed from initial proposal).
2.h*	Number of CBA supervisors trained on HBC.	Number of CBA supervisors trained on HBC in 15 districts.	2.8	Country has supervisory structures and implementation of supervision for malaria treatment.	Activity reports	Semi-annually	308	882	Target exceeded. NMCP requested for training in additional districts.
2.i*	Number of community health officers (CHOs) enrolled in hospital attachment pilot.	Number of CHOs enrolled in hospital attachment pilot.	2.9	Providers demonstrate competence in case management.	Activity reports	Semi-annually	50	83	Target exceeded.



Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status/values	Gaps analysis/notes
2.j	Pilot report of CHO hospital attachment developed.	Pilot report of CHO hospital attachment developed.	2.9	Providers demonstrate competence in case management.	Activity reports	Semi-annually	Pilot analysis disseminated to NMCP, GHS, regional health management teams (RHMTs), district health management teams (DHMTs), and USAID.	Ongoing	Report being finalized.
2.k*	Number of CBAs trained in home based management of malaria (HMM).	Number of CBAs trained in HMM in 25 districts.	2.1	Providers demonstrate competence in case management.	Activity reports	Semi-annually	900	754	Target not reached. 84% complete. Training to be continued in PY3.
2.l*	Number of CBAs enrolled in a facility attachment pilot.	Number of CBAs enrolled in a facility attachment pilot.	2.11	Providers demonstrate competence in case management.	Activity reports	Semi-annually	300		This activity was not planned for PY2 (removed from initial proposal).
2.m	Pilot report of CBA facility attachment developed.	Pilot report of CBA facility attachment developed.	2.11	Providers demonstrate competence in case management.	Activity reports	Semi-annually	Pilot analysis disseminated to NMCP, GHS, RHMTs, DHMTs, and USAID.		This activity was not planned for PY2 (removed from initial proposal).

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status/values	Gaps analysis/notes
2.n*	Number of supportive supervision visits for CBAs.	Number of supportive supervision visits for CBAs.	2.12	Providers demonstrate competence in case management.	Activity reports	Semi-annually	2,000		This activity was not planned for PY2 (removed from initial proposal).
2.o*	Percentage of targeted facility providers trained in case management.	Number of facility providers trained in malaria treatment with WHO-recommended ACTs/total number of targeted providers.	2.6-2.7	Health care providers demonstrate competence in malaria treatment.	Activity reports	Semi-annually	90%	96%	Target reached. Data from OTSS reports and serving as baseline figure.
2.p*	Percentage of targeted CHOs trained in malaria case management.	Number of CHOs trained in malaria treatment with WHO-recommended ACTs/total number of targeted providers.	2.8	Health care providers demonstrate competence in malaria treatment.	Activity reports	Semi-annually	90%	83.20%	Target not reached. Data from 107 CHOs observed during OTSS round 2. Trainings to continue in PY3.
2.q*	Percentage of targeted CBAs trained in case management.	Number of CBAs trained in malaria treatment with WHO-recommended ACTs/total number of targeted providers.	2.1	Health care providers demonstrate competence in malaria treatment.	Activity reports	Semi-annually	90%	84%	Target not reached. 754 of 900 CBAs trained. Trainings to continue in PY3.

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status/values	Gaps analysis/notes
2.r*	Percentage of targeted facility providers who received training by supervisors to address documented errors in determining suspected malaria patients during the reporting period.	Number of facility providers who received training by supervisors to address documented errors determining suspected patients (according to team supervision reports) during the reporting period/total number of facility providers with documented errors in determining suspected patients during team supervision during the reporting period.	2.1	Providers demonstrate competence in detecting suspected malaria cases.	Team supervision reports	Semi-annually	90%	95.70%	Target exceeded. Determined through OTSS reports.
2.s*	Percentage of targeted CBAs who received training by supervisors to address documented errors in determining suspected malaria patients during the reporting period.	Number of CBAs who received training by supervisors to address documented errors determining suspected patients (according to team supervision reports) during the reporting period/total number of CBAs with documented errors in determining suspected patients during team supervision during the reporting period.	2.12	Providers demonstrate competence in detecting suspected malaria cases.	Team supervision reports	Semi-annually	90%		Activity to occur in PY3. CBA OTSS not planned in PY2.

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status/values	Gaps analysis/notes
2.t*	Percentage of targeted facility providers who received training by supervisors to address treatment errors during the reporting period.	Number of targeted facility providers who received training by supervisors to address documented treatment errors (according to team supervision reports) during the reporting period/total number of targeted facility providers with documented errors in case management during team supervision during the reporting period.	2.1	Providers demonstrate competence malaria treatment.	Team supervision reports	Semi-annually	90%	95.70%	Target exceeded. Determined through OTSS reports.
2.u*	Percentage of targeted CBAs who received training by supervisors to address treatment errors during the reporting period.	Number of targeted CBAs who received training by supervisors to address treatment errors during the reporting period/total number of CBAs with documented treatment errors during supervision.	2.12	Providers demonstrate competence in case management.	Team supervision reports	Semi-annually	90%		This activity was not planned for PY2 (was part of initial proposal but was removed).

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status/values	Gaps analysis/notes
2.v	Percentage of targeted facilities receiving at least two clinical supervisory visits per annum.	Number of facilities receiving at least two clinical supervisory visits per annum/total number of targeted facilities.	2.1	Country has supervisory structures for the implementation of supervision for malaria treatment.	Team supervision reports	Semi-annually	90%	118%	Target exceeded. Initial number of facilities was determined based on district health information system (DHIS) data during work plan development, but not all facilities in most districts were captured in DHIS, e.g. new facilities Community based Health Planning and Services and private facilities.
2.w	Percentage of targeted communities receiving at least six CBA supervisory visits per annum.	Number of targeted communities receiving at least six CBA supervisory visits per annum/total number of targeted communities.	2.12	Country has supervisory structures for the implementation of supervision for malaria treatment.	Team supervision reports	Semi-annually	90%		This activity was not planned for PY2 (removed from initial proposal).
2.x*	Percentage of targeted clinical supervisors trained in supervision for case management.	Number of clinical supervisors trained in malaria case management/total number of targeted clinical supervisors.	2.6	Country has supervisory structures for the implementation of supervision for case management.	Activity reports	Semi-annually	90%	111%	Target exceeded. Some districts presented additional clinical supervisors.
2.y*	Percentage of CHO supervisors trained in supervision for case management.	Number of CHOs trained in supervision of CBAs/total number of targeted CHO supervisors.	2.8	Country has supervisory structures for the implementation of supervision for case management.	Activity reports	Semi-annually	90%	286%	Target exceeded. NMCP requested for training in additional districts.

Intermediate outcomes									
Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status/values	Gaps analysis/notes
2.z	Country has national clinical supervision tools with indicators adhering to global standards for determining possible malaria cases.	Country has national clinical supervision tools with indicators adhering to global standards for determining possible malaria cases.	2.2	Country has supervisory structures for the implementation of supervision for malaria treatment.	Activity reports	Semi-annually	National guidelines adhere to global standards.	Complete	Target reached.
2.aa*	Percentage of supervisors demonstrating competence in malaria treatment.	Number of supervisors who score greater than 80% on a treatment posttest during TOTs/total number of supervisors who completed a posttest during a TOT.	2.6, 2.8	Country has supervisory structures for the implementation of supervision for malaria treatment.	Activity reports, posttest results	Semi-annually	90%	57%	Target not reached. Pretest mean score 70% and pretest competence 14%. Posttest mean score 78%.
2.ab*	Percentage of facility providers demonstrating competence in testing suspected patients for malaria.	Number of facility providers who appropriately order or perform testing of suspected malaria patients according to global standards during team supervision observations/total number of providers targeted for team supervision observations during the reporting period.	2.1	Providers demonstrate competence in ordering/conducting malaria diagnostic tests for suspected cases.	Team supervision reports	Semi-annually	90%	83%	Target not reached. Determined from OTSS data.

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status/values	Gaps analysis/notes
2.ac*	Percentage of targeted trained CBAs demonstrating competence in testing suspected patients for malaria.	Number of targeted trained CBAs demonstrating competence in testing suspected patients for malaria/total number of targeted trained CBAs who received a community supervision visit during the reporting period.	2.12	Providers demonstrate competence malaria case management.	Team supervision reports	Semi-annually	80%		This activity was not planned for PY2 (removed from initial proposal).
2.ad*	Percentage of targeted facility providers demonstrating compliance to treatment with WHO-recommended ACT for cases with positive malaria test results.	Number of facility providers who comply to treatment with a WHO-recommended antimalarial for cases with positive malaria test results observed during team supervision visits/total number of facility providers who received team supervision during the reporting period.	2.1	Providers demonstrate competence in malaria case management.	Team supervision reports	Semi-annually	90%	96%	Target exceeded. Determined from OTSS data.
2.ae*	Percentage of CBAs demonstrating compliance to treatment with WHO-recommended ACT for cases with positive malaria test results.	Number of CBAs who comply to treatment with a WHO-recommended antimalarial for cases with positive malaria test results observed during team supervision visits/total number of CBAs that received supervision during the reporting period.	2.12	Providers demonstrate competence in malaria case management.	Team supervision reports	Semi-annually	90%		This activity was not planned for PY2 (removed from initial proposal).

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status/values	Gaps analysis/notes
2.af	Percentage of facility provider adherence to negative test results according to global standards.	Number of providers who did not prescribe ACTs for negative malaria cases/total number of providers with negative malaria cases as observed under supervision.	2.1	Providers demonstrate competence in malaria treatment.	Team supervision reports	Semi-annually	70%	43%	Target not reached. Determined from OTSS round 2 data.
2.ag*	Percentage of CBA adherence to negative test results according to global standards.	Number of negative malaria cases for which CBAs did not prescribe/total number of providers with negative malaria cases observed under supervision.	2.12	Health care providers demonstrate competence in malaria treatment.	Team supervision reports	Semi-annually	80%		This activity was not planned for PY2 (removed from initial proposal).
2.ah*	Percentage of proper referrals by CBAs for fever-related illness.	Number of proper referrals by CBAs for fever-related illness/total number of cases in need of referral observed under supervision.	2.12	Health care providers demonstrate competence in malaria treatment.	Team supervision reports	Semi-annually	70%		This activity was not planned for PY2 (removed from initial proposal).



**Objective 3: Improve accuracy, reliability, and availability of health information management systems.**

**Outputs**

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status/values	Gaps analysis/notes
3.a	Develop assessment report for the Center for Health Information Management and NMCP M&E units.	Assessment report detailing the needs of the CHIM and NMCP in developing a strategy and data quality assessment plan.	3.1	Reporting on malaria indicators is complete and accurate.	Team supervision reports	Semi-annually	Assessment report submitted to stakeholders.	Complete	Target reached.
3.b	Technical assistance provided to Policy, Planning Monitoring and Evaluation/CHIM and the NMCP on revision of standard operating procedures (SOPs).	Technical assistance provided to NMCP on revision of SOPs.	3.2	Reporting on malaria indicators is complete and accurate.	Team supervision reports	Semi-annually	Technical assistance report submitted to stakeholders.	Complete	Target reached.
3.c	Revised SOPs piloted.	Revised SOPs piloted.	3.3	Reporting on malaria indicators is complete and accurate.	Team supervision reports	Semi-annually	Revised SOPs submitted to stakeholders.	Complete	Target reached.
3.d	Number of annual regional technical assistance visits on data preparation conducted.	Number of annual regional technical assistance visits on data preparation conducted.	3.4	Reporting on malaria indicators is complete and accurate.	Team supervision reports	Semi-annually	7	7	Target reached.
3.e*	Number of health information officers (HIOs) trained in data management.	Number of health information officers trained in data management.	3.5	Reporting on malaria indicators is complete and accurate.	Team supervision reports	Semi-annually	230	385	Target exceeded.
3.f	Linked OTSS and DHIS2 data.	System developed to link OTSS and DHIS2 data.	3.6	Reporting on malaria indicators is complete and accurate.	Team supervision reports	Semi-annually	OTSS and DHIS platforms linked.	Ongoing	Migrating from paper-based OTSS reporting to electronic platform.

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status/values	Gaps analysis/notes
3.g	Percentage of targeted facilities that receive an M&E OTSS visit in the reporting period.	Number of targeted facilities that receive an M&E OTSS visit in the reporting period/total number of targeted facilities.	3.7	Reporting on malaria indicators is complete and accurate.	Team supervision reports	Semi-annually	100%	84%	Target not reached.
<b>Intermediate outcomes</b>									
3.h*	Percentage of information officers who are competent in data collection and reporting.	Number of information officers who score 90% or greater on supervision checklists/total number of targeted information officers.	3.1	Reporting on malaria indicators is complete and accurate.	Team supervision reports	Semi-annually	70%	86.52%	Target exceeded. Mean performance score 79% with 1215 observations.
3.i	Percentage of districts in focus regions with staff trained in health management information system (HMIS).	Number of districts in focus regions with staff trained in HMIS/total number of districts in focus regions.	3.5	Reporting on malaria indicators is complete and accurate.	Team supervision reports	Semi-annually	80%	100%	Target exceeded. All district and hospital HIOs trained in HMIS.
<b>Objective 4: Strengthen technical management ability at the regional level for implementing programs and activities.</b>									
<b>Outputs</b>									
4.a	Percentage of regional work plan workshops conducted.	Number of regional work plan workshops conducted/total number of targeted regions for work plan workshops (target = 7).	4.1	Regional work planning is evidence-based.	Activity reports	Semi-annually	100%	100%	Target reached.
4.b	Number of regional planning meetings for rollout of HMM.	Number of regional planning meetings for rollout of HMM.	4.1	Providers demonstrate competence in RDTs.	Activity reports	Semi-annually	4	6	Target exceeded.

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status/values	Gaps analysis/notes
4.c	Plan developed for initiating HMM in 15 focus districts.	Plan developed for initiating HMM in 15 focus districts.	4.1	Providers demonstrate competence in RDTs.	Activity reports	Semi-annually	HMM initiation report submitted to NMCP, ICD, and USAID.		This activity was not planned for PY2 (removed from initial proposal).
4.d	Number of annual data reviews with partners conducted.	Number of annual data review meetings with partners conducted to strengthen coordination.	4.2	Regional work planning is evidence-based.	Activity reports	Semi-annually	7	7	Target reached.
4.e	Number of annual assessment visits conducted by RHMTs to DHMTs.	Number of annual assessment visits to assist RHMTs in assessment, training, and supervision of DHMTs conducted.	4.2	Regional work planning is evidence-based.	Activity reports	Semi-annually	21 (3 in each of seven regions)	13	Target not reached.
<b>Intermediate outcomes</b>									
4.f	Percentage of focus regions that submit complete quarterly program reports to GHS and NMCP.	Number of focus regions that submit complete quarterly program reports to GHS and NMCP/total number of focus regions.	4.1, 4.2	Malaria programing is evidence-based.	Activity reports	Semi-annually	80%	100%	Target exceeded.
4.g	Percentage of focus regions that submit timely quarterly program reports to GHS and NMCP.	Number of focus regions that submit timely quarterly program reports to GHS and NMCP/total number of focus regions.	4.1, 4.2	Malaria programing is evidence-based.	Activity reports	Semi-annually	90%	100%	Target exceeded.
4.h	Percentage of focus regions that engage districts in participatory planning.	Number of focus regions that engage districts in participatory planning/total number of focus regions.	4.1, 4.2	Malaria programing is evidence-based.	Activity reports	Semi-annually	100%	100%	Target reached.

**Project management: Assure the visibility and support the mission of PMI through strong partner relationships.**

**Outputs**

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status/values	Gaps analysis/notes
5.a	Number of working groups and/or task force meetings attended.	Number of working groups and/or task force meetings held or attended with in-country partners.	5.1	Strong relationships and presence in focus countries.	Activity reports	Semi-annually	8	8	Target reached.
5.b	Establish two regional offices.	Establish office space and finance and administrative systems, procure equipment, and hire staff.	5.2	Strong relationships and presence in focus countries.	Activity reports	Semi-annually	2	2	Target reached.
5.c	Publish a Ghana story in MalariaCare publication or website.	Publish a Ghana story in MalariaCare publication or website.	5.5	Strong relationships and presence in focus countries.	Activity reports	Semi-annually	4	1	Target not reached. One success story presented to PMI for reporting.
5.d	Number of government personnel participating in international conferences.	Number of government personnel participating in international conferences.	5.7	Regional work planning is evidence-based.	Activity reports	Semi-annually	2	3	Target exceeded.
5.e	Number of NMCP staff sponsored to pursue an entomology degree.	Number of NMCP staff sponsored to pursue an entomology degree at the University of Ghana.	5.8	Providers demonstrate competence in RDTs and microscopy.	Activity reports	Semi-annually	1	1	Target reached.

# Guinea

Objective 1: The accuracy of diagnostic testing for malaria is improved to greater than 90%.

## Outputs

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status / values	Gaps analysis/notes
1.a*	Number of MDRT participants trained (basic).	Number of laboratory technicians trained in MDRT.	1.1	Providers demonstrate competence in RDTs and/or microscopy.	Activity reports	Annually	23	<u>25 total</u> 17 male 8 female	Target reached.
1.b*	Percentage of targeted clinical providers trained in RDTs.	Number of clinical providers trained in RDTs/total number of targeted clinical providers.	1.1	Providers demonstrate competence in RDTs and/or microscopy.	OTSS activity reports	Semi-annually	27 (3 trainings per visited health facility)	<u>24 total</u> 16 male 8 female	Target not reached; 27 trainings were expected, 24 occurred. Values derived from most recent round of OTSS for which data are available.
1.c*	Percentage of targeted laboratory technicians trained in RDTs.	Number of laboratory technicians trained in RDTs/total number of targeted laboratory technicians.	1.1	Providers demonstrate competence in RDTs and/or microscopy.	OTSS activity reports	Semi-annually	27 (3 trainings per visited health facility)	<u>68 total</u> 38 male 30 female	Target exceeded; 27 trainings were expected, 68 occurred. Values derived from most recent round of OTSS for which data are available.
1.d*	Percentage of targeted laboratory technicians trained in malaria microscopy.	Number of laboratory technicians trained in microscopy/total number of targeted laboratory technicians.	1.1	Providers demonstrate competence in RDTs and/or microscopy.	OTSS activity reports	Semi-annually	27 (3 trainings per visited health facility)	<u>82 total</u> 41 male 34 female 7 sex unknown	Target exceeded; 27 trainings were expected, 82 occurred. Values derived from most recent round of OTSS for which data are available.

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status / values	Gaps analysis/notes
1.e	Revised checklist for OTSS.	Revised and approved checklist is adopted for use during OTSS visits.	1.2	Clear and disseminated laboratory guidelines and supervision structures.	Activity reports	Semi-annually	Revised and approved checklist is adopted for OTSS.	Completed	Target reached.
1.f*	Number of laboratory supervisor participants attending the OTSS training workshop.	Number of laboratory supervisor participants attending the OTSS training workshop.	1.3	Clear and disseminated laboratory guidelines and supervision structures.	OTSS training workshop report	Semi-annually	8	<u>18 total</u> 17 male 1 female	Target exceeded.
1.g	Number of OTSS visits conducted.	Number of OTSS visits conducted at targeted laboratories. Total number including all rounds of OTSS at each facility.	1.4	Providers demonstrate competence in RDTs and/or microscopy.	OTSS activity reports	Semi-annually	36	27	Target not yet achieved; 1 additional round of OTSS was expected under PY2, but due to the Ebola crisis, activities were put on hold.
1.h	Percentage of targeted facilities with at least one provider formally trained in RDTs in the past 12 months.	Number of targeted facilities with one or more providers formally trained in RDTs in the past 12 months/total number of targeted facilities.	1.4	Providers demonstrate competence in RDTs and/or microscopy.	OTSS activity reports	Semi-annually	80%	100.0%	Target reached; 9 of 9 facilities had at least one provider formally trained in RDTs in the past 12 months.
1.i	Percentage of targeted facilities with at least one provider formally trained in malaria microscopy in the past 12 months.	Number of targeted facilities with one or more providers formally trained in malaria microscopy in the past 12 months/total number of targeted facilities.	1.4	Providers demonstrate competence in RDTs and/or microscopy.	OTSS activity reports	Semi-annually	80%	88.9%	Target reached; 8 of 9 facilities had at least one provider formally trained in malaria microscopy in the past 12 months.

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status / values	Gaps analysis/notes
1.j*	Percentage of targeted providers who received training by supervisors on documented diagnostic errors during the reporting period.	Number of providers who received training by supervisors on documented diagnostics errors (according to team supervision reports) during the reporting period/total number of providers with documented errors in diagnostics during team supervision during the reporting period.	1.4	Providers demonstrate competence in RDTs and/or microscopy.	OTSS activity reports	Semi-annually	80%	<u>174 total</u> 95 male 72 female 7 sex unknown	Unable to calculate percentages. Results reflect the total number of on-the-job training provided by supervisors.
1.k	Percentage of targeted facilities with at least one provider who received MDRT in the last two years.	Number of targeted facilities with one or more providers who received MDRT in the last two years/total number of targeted facilities.	1.4	Reference laboratories and facilities able to provide high-quality diagnostics for malaria and other febrile illness.	OTSS report	Semi-annually	75%	44.4%	Target not reached; 4 out of the 9 OTSS sites had a staff member attend the MDRT course under MalariaCare.
1.l	Number of bench aids and training manuals printed and distributed.	Number of bench aids and training manuals printed and distributed.	1.5	Reference laboratories and facilities able to provide high-quality diagnostics for malaria and other febrile illness.	Activity reports	Semi-annually	75	135 bench aids 11 SOP sets	Target exceeded; at the mission's request, SOPs and additional bench aides were printed/distributed.

Intermediate outcomes									
Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status / values	Gaps analysis/notes
1.m	Country has national malaria diagnostics supervision tools whose indicators adhere to global standards.	Number of targeted countries whose national malaria diagnostics supervision tools adhere to global standards/total number of targeted countries.	1.2	Country has full national policies for malaria treatment.	Activity reports	Semi-annually	Revised guidelines that meet global standards.	Malaria diagnostic supervision tools are vetted and in use.	
1.n*	Percentage of supervisors demonstrating competence in malaria microscopy.	Percentage of supervisors who score 90% or greater in slide preparation and parasite detection during the TOT posttest/total number of supervisors who completed a posttest during a TOT.	1.3	Providers demonstrate competence in RDTs and/or microscopy.	OTSS activity reports	Semi-annually	90%	32% (8 of 25 participants scored 90% or higher)	Of those participants who attended the training in its entirety (n=18), their average posttest score was 79%.
1.o*	Percentage of supervisors demonstrating competence in RDTs.	Percentage of supervisors who score 90% or greater in preparation and reading of RDTs during the TOT posttest/total number of supervisors who completed a posttest during a TOT.	1.3	Providers demonstrate competence in RDTs and/or microscopy.	OTSS activity reports	Semi-annually	90%	100% <u>25 total</u> 17 male 8 female	Target exceeded.
1.p*	Percentage of targeted laboratory technicians demonstrating competence in RDTs.	Number of targeted laboratory technicians who score 90% or greater on supervisory checklists measuring the preparation and reading of the malaria RDTs demonstrating competence in RDTs/total number of laboratory staff who received a supervisory visit during the reporting period.	1.4	Providers demonstrate competence in RDTs and/or microscopy.	OTSS activity reports	Semi-annually	90%	60% met the 90% target or above, with an average score of 90.8%	Target not reached; only 12 out of 20 observed laboratory staff performed at 90% or greater with respect to RDT administration; unable to disaggregate by sex.



Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status / values	Gaps analysis/notes
1.q*	Percentage of targeted laboratory technicians demonstrating competence in malaria microscopy.	Number of targeted laboratory technicians who score 90% or greater on supervisory checklist measuring slide preparation and parasite detection/total number of laboratory technicians who received a supervisory visit during the reporting period.	1.4	Providers demonstrate competence in RDTs and/or microscopy.	OTSS activity reports	Semi-annually	90%	65.2% met the 90% target or above, with an average score of 93.4%	
1.r*	Percentage of targeted clinical providers who demonstrate competence in RDTs.	Number of targeted clinical providers who score 90% or greater on supervisory checklists measuring the preparation and reading of the malaria RDTs/total number of clinical providers who received a supervisory visit during the reporting period.	1.4	Providers demonstrate competence in RDTs and/or microscopy.	OTSS activity reports	Semi-annually	90%	42.1% met the 90% target or above, with an average score of 75.9%	
1.s	Percentage of targeted facilities that meet standards (including appropriate materials, documentation, and qualified staff) for high-quality diagnosis of malaria.	Number of targeted facilities that score 90% or greater on facility checklists for diagnosis during supervisory visits/total number of targeted facilities that received a supervisory visit during the reporting period.	1.4	Providers demonstrate competence in RDTs and/or microscopy.	OTSS activity reports	Semi-annually	90%	87.5%	

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status / values	Gaps analysis/notes
1.t	Percentage of targeted facilities with complete and updated guidelines for malaria diagnosis that meet global standards.	Number of targeted facilities with complete and updated guidelines for malaria diagnosis that meet global standards/total number of targeted facilities.	1.4	Reference laboratories and facilities able to provide high-quality diagnostics for malaria and other febrile illness.	OTSS activity reports	Semi-annually	90%	100.0%	9 out of 9 OTSS sites had all recommended SOPs and bench aids for malaria diagnostic procedures.
<b>Objective 2: Increased percentage of patients suspected to have malaria or febrile illness who receive a diagnostic test.</b>									
NO ACTIVITIES FOR PY2									
<b>Objective 3: Increased percentage of patients who receive appropriate treatment for malaria or other febrile illnesses-consistent with the diagnostic test.</b>									
NO ACTIVITIES FOR PY2									
<b>Objective 4: Strengthened laboratory systems at the country level for detecting malaria and other infectious diseases.</b>									
4.a	Percentage of targeted laboratories that meet global standards for high-quality malaria diagnostics.	Number of targeted laboratories that meet 90% or greater on re-checking of malaria slides during supervisory visits/total number of targeted who received a supervisory visit during the reporting period.	1.4	Reference laboratories and facilities able to provide high-quality diagnostics for malaria and other febrile illness.	OTSS activity reports	Semi-annually	90%	88.9% met the 90% target or above, with an average score of 96.7%	Target not reached; 8 out of the 9 OTSS sites had 90% or greater agreement on malaria slide re-checking compared to OTSS supervisor results.
4.b	Percentage of targeted facilities receiving at least two laboratory supervisory visits per annum.	Number of facilities receiving at least two laboratory supervisory visits per annum/total number of targeted facilities.	1.4	Reference laboratories and facilities are able to provide high-quality diagnostics for malaria and other febrile illnesses.	OTSS activity reports	Semi-annually	100%	100%	Target achieved.

# Liberia

## Objective 1: The accuracy of diagnostic testing for malaria is improved to greater than 90%.

### Outputs

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status / values	Gaps analysis/notes
1.1*	Number of laboratory professionals sent to external competency assessment of malaria microscopy (ECAMM) training.	Number of laboratory professionals sent to ECAMM training.	1.1	Providers demonstrate competence in RDTs and/or microscopy.	Activity reports	Semi-annually	2	<u>3 total</u> 1 female 2 male	Target exceeded.
1.2*	Number of participants in MDRT for supervisors.	Number of participants in MDRT for supervisors.	1.2	Providers demonstrate competence in RDTs and/or microscopy.	Activity reports	Semi-annually	6	<u>19 total</u> 19 male	Target exceeded.
1.3*	Number of MDRT laboratory technicians trained.	Number of MDRT laboratory technicians trained.	1.3	Providers demonstrate competence in RDTs and/or microscopy.	Activity reports	Semi-annually	90	Activity delayed	Due to the Ebola crisis, this activity was delayed.
1.4	Slide sets procured for training purposes.	Slide sets procured for training purposes.	1.4	Clear and functioning QA procedures for regulation of diagnostics for malaria and other infectious diseases.	Activity reports	Semi-annually	15 slide sets procured	Activity delayed	Due to the Ebola crisis, composition and procurement order for the slides has been delayed.
1.5	Number of OTSS visits conducted.	Number of OTSS visits conducted.	1.5	Clear and disseminated laboratory guidelines and supervision structures.	Team supervision reports	Semi-annually	100	--	No OTSS rounds were completed in PY2.

Intermediate outcomes									
Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status / values	Gaps analysis/notes
1.7*	Percentage of diagnostic supervisors or hospital laboratory supervisors in targeted counties trained in supervision for laboratory diagnosis of malaria.	Percentage of diagnostic supervisors or hospital laboratory supervisors in targeted counties trained in supervision for laboratory diagnosis of malaria/number of targeted diagnostic supervisors or hospital laboratory supervisors in targeted counties.	1.2	Clear and disseminated laboratory guidelines, procurement policies, and supervision structures.	Team supervision reports	Semi-annually	90%*	--	This training did not occur in PY2.
1.8*	Percentage of laboratory supervisors demonstrating competence in malaria microscopy.	Percentage of laboratory supervisors who score 90% or greater in slide preparation and parasite detection during the TOT posttest/total number of laboratory supervisors who completed a posttest during a TOT.	1.2	Providers demonstrate competence in RDTs and/or microscopy.	Team supervision reports	Semi-annually	90%*	0% 0/19 (mean 73%)	Target not reached; no MDRT participants met the threshold score of 90% for parasite detection. However, the mean score was 73%.
1.9*	Percentage of laboratory supervisors demonstrating competence in RDTs.	Percentage of supervisors who score 90% or greater in preparation and reading of RDTs during the TOT posttest/total number of supervisors who completed a posttest during a TOT.	1.2	Providers demonstrate competence in RDTs and/or microscopy.	Team supervision reports	Semi-annually	90%*	0% 0/19 (mean 63.3%)	Target not reached; no MDRT participants met the threshold score of 90% for correctly using RDTs.

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status / values	Gaps analysis/notes
1.10	Percentage of targeted facilities with at least one provider trained in RDTs.	Number of targeted facilities with one or more providers trained in RDT/total number of targeted facilities.	1.5	Providers demonstrate competence in RDTs and/or microscopy.	Team supervision reports	Semi-annually	80%*	--	No OTSS rounds were completed in PY2.
1.11*	Percentage of targeted providers who received training by supervisors on documented diagnostic errors during the reporting period.	Number of providers who received training by supervisors on documented diagnostics errors (according to team supervision reports) during the reporting period/total number of providers with documented errors in diagnostics during team supervision during the reporting period.	1.5	Providers demonstrate competence in RDTs and/or microscopy.	Team supervision reports	Semi-annually	80%*	--	No OTSS rounds were completed in PY2.
1.12*	Percentage of targeted laboratory technicians demonstrating competence in RDTs.	Number of targeted laboratory technicians who score 90% or greater on supervisory checklists measuring the preparation and reading of the malaria RDTs demonstrating competence in RDTs/total number of laboratory staff who received a supervisory visit during the reporting period.	1.5	Providers demonstrate competence in RDTs and/or microscopy.	Team supervision reports	Semi-annually	90%*	--	No OTSS rounds were completed in PY2.

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status / values	Gaps analysis/notes
1.13*	Percentage of targeted laboratory technicians demonstrating competence in malaria microscopy.	Number of targeted laboratory technicians who score 90% or greater on supervisory checklist measuring slide preparation and parasite detection/total number of laboratory technicians who received a supervisory visit during the reporting period.	1.5	Providers demonstrate competence in RDTs and/or microscopy.	Team supervision reports	Semi-annually	90%*	--	No OTSS rounds were completed in PY2.
1.14*	Percentage of targeted providers accurately recording laboratory data in laboratory registers.		1.5	Clear and functioning QA procedures for regulation of diagnostics for malaria.	Team supervision reports	Semi-annually	80%*	--	MalariaCare audited NMCP procedures to compile laboratory results captured through the HMIS and is currently taking corrective actions to improve reporting/ interpretation of data; no OTSS rounds were completed in PY2.
<b>Objective 2: Increased percentage of patients suspected to have malaria or febrile illness who receive a diagnostic test.</b>									
NO ACTIVITIES FOR PY2									
<b>Objective 3: Increased percentage of patients who receive appropriate treatment for malaria or other febrile illnesses, consistent with the diagnostic test.</b>									
NO ACTIVITIES FOR PY2									

Objective 4: Strengthened laboratory systems at the country level for detecting malaria and other infectious diseases.

Outputs

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status / values	Gaps analysis/notes
4.1	Stakeholder meeting for policy review conducted.	Stakeholder meeting for policy review conducted.	4.1	Assure the visibility and support the mission of PMI through strong partner relationships.	Activity reports	Semi-annually	Revised policy adopted	Completed	The stakeholders meeting for integration of the malaria diagnostic component of the community health team (CHT) supervision tool was conducted, and the revised policy adopted.
4.2	Number of diagnostic guidelines printed and distributed.	Number of diagnostic guidelines printed and distributed.	4.2	Clear and functioning QA procedures for regulation of diagnostics for malaria.	Activity reports	Semi-annually	500	Pending	The revised National Laboratory Guidelines are being reviewed by Liberian stakeholders. The guidelines will be printed, following validation of the guidelines.

# Malawi

## Objective 1: The accuracy of diagnostic testing for malaria is improved to greater than 90%.

### Outputs

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status / values	Gaps analysis/notes
1.a*	Number of MDRT participants trained.	Number of laboratory technicians trained in MDRTs (from districts).	1.1	Providers demonstrate competence in RDTs and microscopy.	Activity reports	Semi-annually	20	<u>20 total</u> 15 male 5 female	Target met. 20 laboratory supervisors trained at MDRT. 1
1.b*	Number of participants trained in RDT.	Number of participants trained in RDT for malaria diagnosis (disaggregated by type of provider).	2.1. 3.1	Providers demonstrate competence in RDTs and microscopy.	Activity reports	Semi-annually	564 HSAs 600 health facility staff Total: 1,164		Moved to PY3.
1.c	WHO external accreditation of malaria microscopy achieved.	WHO external accreditation of malaria microscopy achieved.	1.2	Clear and functioning QA procedures for regulation of diagnostics for malaria and other infectious diseases.	Activity reports	Semi-annually	WHO accreditation certification disseminated to stakeholders.	WHO external accreditation of malaria microscopy achieved.	Target met. 2 microscopists achieved accreditation.
1.d	Number of OTSS visits conducted.	Number of OTSS visits conducted at targeted laboratories/total number including all rounds of OTSS and each facility.	1.3	Providers demonstrate competence in RDTs and microscopy.	Team supervision reports	Semi-annually	500 facility visits conducted.	273 visits conducted in round 1.	Data entry for round 2 is ongoing. In round 1—250 health facilities targeted; 273 were visited.
1.e	Number of laboratory management meetings conducted.	Number of laboratory management meetings conducted.	1.4	Clear and disseminated laboratory guidelines, procurement policies, and supervision structures.	Team supervision reports	Semi-annually	2	2	Target met. OTSS lessons learned meetings conducted. Integrated per NMCP/mission agreement.
1.f	National stakeholder meeting on RDTs and community case management conducted.	National stakeholder meeting on RDTs and CCM conducted.	2.2	Clear and functioning QA procedures for regulation of diagnostics for malaria and other infectious diseases.	Team supervision reports	Semi-annually	National stakeholder meeting on RDTs and CCM conducted.		Moved to PY3.



Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status / values	Gaps analysis/notes
1.g	Laboratory management dissemination meeting conducted for DHMTs.	Laboratory management dissemination meeting conducted for DHMTs.	1.5	Clear and disseminated laboratory guidelines, procurement policies, and supervision structures.	Team supervision reports	Semi-annually	Report with next steps developed and submitted to stakeholders.	OTSS lessons learned meeting reports developed and submitted to stakeholders.	Target met. 2 OTSS lessons learned meetings conducted. Integrated per NMCP/mission agreement. OTSS lessons learned meeting reports developed and submitted to stakeholders.
1.h	Percentage of targeted facilities with at least one provider trained in RDTs.	Number of targeted facilities with one or more providers trained in RDTs/total number of targeted facilities.	1.3	Providers demonstrate competence in RDTs and/or microscopy.	Team supervision reports	Semi-annually	100%	98%	Target not met.
1.i	Percentage of targeted facilities with at least one provider trained in malaria microscopy.	Number of targeted facilities with one or more providers trained in malaria microscopy/total number of targeted facilities.	1.3	Providers demonstrate competence in RDTs and/or microscopy.	Team supervision reports	Semi-annually	90%	85%	Target not met.
1.j*	Percentage of targeted supervisors trained in supervision for laboratory diagnosis of malaria.	Number of supervisors trained in supervision for laboratory diagnosis of malaria/total number of targeted supervisors.	1.3	Providers demonstrate competence in RDTs and/or microscopy.	Activity reports	Semi-annually	90%	100%	Target exceeded.
1.k*	Percentage of targeted providers who received training by supervisors on documented diagnostic errors in the reporting period.	Number of providers who received training by supervisors on documented diagnostics errors (according to team supervision reports) in the reporting period/total number of providers with documented errors in diagnostics during team supervision in the reporting period.	1.3	Providers demonstrate competence in RDTs and/or microscopy.	Team supervision reports	Semi-annually	80%	86%	Target exceeded.

Intermediate outcomes

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status / values	Gaps analysis/notes
1.l*	Percentage of targeted laboratory technicians demonstrating competence in RDTs.	Number of targeted laboratory technicians who score 90% or greater on supervisory checklists measuring the preparation and reading of malaria RDTs/total number of laboratory staff who received a supervisory visit in the reporting period.	1.3	Providers demonstrate competence in RDTs and/or microscopy.	Team supervision reports	Semi-annually	80%	64%	Target not met. Mean score 88.5%.
1.m*	Percentage of targeted laboratory technicians demonstrating competence in malaria microscopy.	Number of targeted laboratory technicians who score 90% or greater on supervisory checklist measuring slide preparation and parasite detection/total number of laboratory technicians who received a supervisory visit in the reporting period.	1.3	Providers demonstrate competence in RDTs and/or microscopy.	Team supervision reports	Semi-annually	20%**	64%	Target exceeded. Average score 80%
1.n*	Percentage of laboratory supervisors demonstrating competence in malaria microscopy.	Percentage of laboratory supervisors who score 90% or greater in slide preparation and parasite detection on the TOT posttest/total number of laboratory supervisors who completed a posttest at a TOT.	1.1	Providers demonstrate competence in RDTs and/or microscopy.	Activity reports	Semi-annually	90%	90%	Target met.
1.o*	Percentage of supervisors demonstrating competence in RDTs.	Percentage of supervisors who score 90% or greater in preparation and reading of RDTs on the TOT posttest/total number of supervisors who completed a posttest at a TOT.	1.1	Providers demonstrate competence in RDTs and/or microscopy.	Activity reports	Semi-annually	90%	77%	Target not met.

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status / values	Gaps analysis/notes
1.p	Percentage of targeted (OTSS) clinics that meet standards (including appropriate materials, documentation, and qualified staff) for high-quality diagnosis of malaria.	Number of targeted clinics that meet 90% or greater on facility checklists for diagnosis during supervisory visits/total number of targeted facilities that received a supervisory visit in the reporting period.	1.3	Providers demonstrate competence in RDTs and/or microscopy.	Activity reports	Semi-annually	90%	79%	Target not met.
<b>Objective 2: Increased percentage of patients suspected to have malaria or febrile illness who receive a diagnostic test.</b>									
<b>Outputs</b>									
Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status/ values	Gaps analysis/notes
2.a*	Percentage of targeted providers who received training by supervisors on documented errors in identifying suspected malaria patients in the reporting period.	Number of providers who received training by supervisors on documented errors identifying suspected patients (according to team supervision reports) in the reporting period/total number of providers with documented errors in identifying suspected patients during team supervision in the reporting period (disaggregated by provider type).	1.3, 3.2	Providers demonstrate competence in malaria case management.	Activity reports	Semi-annually	90%	86%	Target not met.
<b>Intermediate outcomes</b>									
2.b*	Percentage of targeted providers demonstrating competence in testing suspected patients for malaria.	Number of targeted clinics that meet 90% or greater on facility checklists for testing suspected patients during supervisory visits/total number of targeted facilities that received a supervisory visit in the reporting period (disaggregated by provider type).	1.3, 3.2	Providers demonstrate competence in detecting suspected malaria cases.	Activity reports	Semi-annually	75%	68%	Target not met. Average score 97%.

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status / values	Gaps analysis/notes
2.c*	Percentage of providers demonstrating competence in identifying suspected malaria cases according to global standards.	Number of providers who demonstrate correct procedures for differential diagnosis of possible malarial symptoms according to global standards during team supervision observation/total number of providers targeted for team supervision during the reporting period (disaggregated by provider type).	1.3, 3.2	Providers demonstrate competence in detecting suspected malaria cases.	Activity reports	Semi-annually	80%	75%	Target not met.
<b>Objective 3: Increased percentage of patients who receive appropriate treatment for malaria or other febrile illnesses-consistent with the diagnostic test.</b>									
<b>Outputs</b>									
3.a*	Percentage of targeted providers trained in malaria treatment.	Number of providers trained in malaria treatment with WHO-recommended ACT/total number of targeted providers (disaggregated by provider type).	1.3, 3.2	Providers demonstrate competence in malaria case management.	Activity reports	Semi-annually	90%	63%	Target not met.
3.b*	Percentage of targeted providers who received training in malaria treatment by supervisors in the reporting period.	Number of providers who received training in malaria treatment by supervisors based on documented errors in the reporting period/total number of providers who had documented errors during team supervision in the reporting period (disaggregated by provider type).	1.3, 3.2	Providers demonstrate competence in malaria case management.	Activity reports	Semi-annually	90%	86%	Target not met.
3.c	Percentage of targeted facilities receiving at least two clinical supervisory visits per annum.	Number of facilities receiving at least two clinical supervisory visits per annum/total number of targeted facilities.	1.3	Providers demonstrate competence in malaria case management.	Activity reports	Semi-annually	90%	82%	Target not met.

## Intermediate outcomes

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status / values	Gaps analysis/notes
3.e	Country has national clinical supervision tools whose indicators adhere to global standards for malaria treatment.	Country has national clinical supervision tools whose indicators adhere to global standards for malaria treatment.	4.2	Clear and disseminated clinical guidelines, procurement policies, and supervision structures.	Activity reports	Semi-annually	Revised checklist whose indicators adhere to global standards	Complete.	Target met. Revised clinical supervision checklist developed.
3.f	Percentage of targeted clinics that meet standards (including appropriate materials, documentation, and qualified staff) for high-quality treatment of malaria.	Number of targeted clinics that meet 90% or greater on facility checklists during supervisory visits/total number of targeted facilities that received a supervisory visit in the reporting period.	3.1	Providers demonstrate competence in malaria case management.	Activity reports	Semi-annually	90%	84%	Target not met.
3.g*	Percentage of targeted providers demonstrating compliance with treatment according to national treatment guidelines using WHO-recommended ACT for cases with positive malaria test results.	Number of providers who comply with treatment using WHO-recommended ACT for cases with positive malaria test results measured through direct observation during team supervision visits/total number of providers who received team supervision in the reporting period (disaggregated by provider type).	3.1, 3.2	Providers demonstrate competence in malaria case management.	Activity reports	Semi-annually	90%	83%	Target not met.
3.h*	Percentage of providers demonstrating competence in identifying suspected malaria cases according to Malawi treatment guidelines and WHO recommendations.	Number of providers who demonstrate correct procedures for differential diagnosis of possible malarial symptoms according to global standards during team supervision observation/total number of providers targeted for team supervision in the reporting period (disaggregated by provider type).	3.1, 3.2	Providers demonstrate competence in malaria case management.	Activity reports	Semi-annually	90%	84%	Target not met.

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status / values	Gaps analysis/notes
3.i	Percentage of providers demonstrating adherence to negative test (microscopy and RDT) results according to national and global standards.	Number of providers demonstrating adherence to negative test results according to national and global standards measured through direct observation during team supervision visits/total number of providers who received team supervision in the reporting period (disaggregated by provider type and test type).	3.1, 3.2	Providers demonstrate competence in malaria case management.	Activity reports	Semi-annually	90%	73%	Target not met. Average score 90%
<b>Objective 4: Strengthened laboratory systems at the country level for detecting malaria and other infectious diseases.</b>									
<b>Outputs</b>									
4.a	Revision and distribution of national diagnostic guidelines for malaria through the Case Management Technical Working Group (TWG).	Revision and distribution of national diagnostic guidelines for malaria through the Case Management TWG.	4.1, 4.5	Reference laboratories and facilities are able to provide high-quality diagnostics for malaria and other febrile illnesses.	Activity reports	Semi-annually	Guidelines printed and distributed to the laboratory network in coordination with Support for Service Delivery Integration (SSDI) project.	Ongoing.	Target not met. The TWG meeting was held in May and the diagnostic guidelines were revised. Printing and distribution will take place in PY3.
4.b	Integrated checklist developed for OTSS laboratory visits.	Integrated checklist developed from an integration workshop with other programs, including tuberculosis (TB) and HIV/AIDS, for OTSS visits.	4.2	Reference laboratories and facilities are able to provide high-quality diagnostics for malaria and other febrile illnesses.	Activity reports	Semi-annually	Integrated checklist developed.	Complete.	Target met. Integrated checklist developed.
4.c*	Number of people trained in the piloting of the national revised laboratory checklist and use of tablets for supervision.	Number of people trained in the piloting of the national revised laboratory checklist and use of tablets for supervision.	4.3	Clear and disseminated laboratory guidelines, procurement policies, and supervision structures.	Activity reports	Semi-annually	8	Complete.	Target met. 8 people trained in the piloting of the national revised laboratory checklist and use of tablets for supervision.

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status / values	Gaps analysis/notes
4.d	Number of laboratory management meetings and management dissemination meetings held.	Number of laboratory management meetings and management dissemination meetings held.	4.7, 4.8	Clear and disseminated laboratory guidelines, procurement policies, and supervision structures.	Activity reports	Semi-annually	3	1	Target not met. 1 lessons learned workshops conducted. Integrated per NMCP/mission agreement.
<b>Intermediate outcomes</b>									
4.e	Country has national malaria diagnostics supervision tools whose indicators adhere to national and global standards.	Country has national malaria diagnostics supervision tools whose indicators adhere to national and global standards.	4.2	Clear and disseminated laboratory guidelines, procurement policies, and supervision structures.	Activity reports	Semi-annually	Checklist adhering to global standards.	Complete.	Target met. Revised diagnostic supervision checklist developed
4.f	Percentage of targeted facilities with complete and updated guidelines for malaria diagnosis that meet global standards.	Number of targeted facilities with complete and updated guidelines for malaria diagnosis that meet global standards/total number of targeted facilities.	1.3	Reference laboratories and facilities are able to provide high-quality diagnostics for malaria and other febrile illnesses.	Activity reports	Semi-annually	90%	84%	Target not met.
4.g	Percentage of targeted laboratories that meet national and global standards for high-quality malaria diagnostics.	Number of targeted laboratories that meet 90% or greater on re-checking of malaria slides during supervisory visits/total number of targeted laboratories that received a supervisory visit during the reporting period.	1.3	Reference laboratories and facilities are able to provide high-quality diagnostics for malaria and other febrile illnesses.	Activity reports	Semi-annually	90%	90%	Target met.
4.h	Percentage of targeted facilities receiving at least two laboratory supervisory visits per annum.	Number of facilities receiving at least two laboratory supervisory visits per annum/total number of targeted facilities.	1.3	Reference laboratories and facilities are able to provide high-quality diagnostics for malaria and other febrile illnesses.	Activity reports	Semi-annually	90%	81%	Target not met.

Program management

Outputs

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status / values	Gaps analysis/notes
5.a	MalariaCare integrated community case management (iCCM) expert hired to work in collaboration with Save the Children.	MalariaCare iCCM expert hired to work in collaboration with Save the Children.	2.1, 2.2, 3.2, 3.3	Assure the visibility and support the mission of PMI through strong partner relationships.	Activity reports	Semi-annually	MalariaCare iCCM expert hired.	Not done	Target not met.



# Zambia

## Objective 1: The accuracy of diagnostic testing for malaria is improved to greater than 90%.

### Outputs

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status / values	Gaps analysis/notes
1.a	Number of national laboratory training manuals printed and distributed.	Number of national laboratory training manuals printed and distributed.	1.1	Clear and disseminated laboratory guidelines, procurement policies, and supervision structures.	Activity reports	Semi-annually	200	Delayed	Delayed; will be printed in PY3.
1.b*	Number of MDRT participants trained.	Number of MDRT participants trained in a national-level expert accreditation course.	1.2	Providers demonstrate competence in RDTs and/or microscopy.	Activity reports	Semi-annually	20	<u>21 total</u> 3 female 18 male	Completed; 21 MDRT participants trained.
1.c	Laboratory OTSS checklist revised and finalized.	Laboratory OTSS checklist revised and finalized.	1.3	Clear and disseminated laboratory guidelines, procurement policies, and supervision structures.	Activity reports	Semi-annually	Revised and finalized laboratory OTSS checklist disseminated	Completed	Completed; revised laboratory OTSS checklist used during round 13 OTSS.
1.d	NAMS protocol finalized.	NAMS protocol finalized.	1.4	QA procedures for regulation of diagnostics for malaria and other infectious diseases.	Activity reports	Semi-annually	NAMS protocol finalized and submitted to stakeholders and IRB as needed.	In progress	In progress; NAMS protocol is in final review stages and will then be submitted to IRB early in PY3.

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status / values	Gaps analysis/notes
1.e*	Percentage of targeted laboratory technicians who received training by supervisors on documented diagnostic errors in the reporting period.	Number of providers who received training by supervisors on documented diagnostic errors (according to team supervision reports) in the reporting period/total number of providers with documented errors in diagnostics during team supervision in the reporting period.	2.1–2.4	Providers demonstrate competence in RDTs and/or microscopy.	Activity reports	Semi-annually	90%	74 total 64 male 9 female 1 sex unknown	Unable to calculate percentages. Current tools do not collect information on diagnostic errors linked to on-the-job trainings. Results reflect the total number of on-the-job training provided by supervisors.
1.f	Percentage of targeted facilities with at least one laboratory technician formally trained in RDTs in the past 12 months.	Number of targeted facilities with one or more laboratory technician formally trained in RDTs in the past 12 months /total number of targeted facilities	2.1–2.4	Providers demonstrate competence in RDTs and/or microscopy.	Activity reports	Semi-annually	90%	11.8%	Target not reached; 19 out of 161 laboratory OTSS sites for which data are available had at least one laboratory technician formally trained in RDTs in the past 12 months.
1.g	Percentage of targeted facilities with at least one laboratory technician formally trained in malaria microscopy in the past 12 months.	Number of targeted facilities with one or more laboratory technicians formally trained in malaria microscopy in the past 12 months/total number of targeted facilities	2.1–2.4	Providers demonstrate competence in RDTs and/or microscopy.	Activity reports	Semi-annually	90%	13.0%	Target not reached; 21 out of 161 OTSS sites for which data are available had at least one laboratory technician formally trained in malaria microscopy in the past 12 months.
1.h*	Percentage of supervisors demonstrating competence in malaria microscopy in a national accreditation course.	Percentage of supervisors who score 90% or greater in slide preparation and parasite detection on the national accreditation posttest/total number of supervisors who completed a posttest at the national accreditation course.	1.2	Providers demonstrate competence in RDTs and/or microscopy.	Activity reports	Semi-annually	90%	76.2% met the 90% target or above, with an average score of 92.5%	16 out of the 21 MDRT participants scored at least 90% in parasite identification.

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status / values	Gaps analysis/notes
1.i*	Percentage of targeted laboratory technicians demonstrating competence in malaria microscopy.	Number of targeted laboratory technicians who score 90% or greater on supervisory checklist measuring slide preparation and parasite detection/total number of laboratory technicians who received a supervisory visit in the reporting period.	2.1–2.4	Providers demonstrate competence in RDTs and/or microscopy.	Activity reports	Semi-annually	90%	57.3% met the 90% target or above, with an average score of 87.9%	Target not reached; only 176 out of 307 observed laboratory staff performed at 90% or greater with respect to malaria stain preparation, staining, and reading. A single technician may have been observed multiple times. Unable to disaggregate by sex.
1.j*	Percentage of targeted laboratory technicians demonstrating competence in RDTs.	Number of targeted laboratory technicians who score 90% or greater on supervisory checklists measuring the preparation and reading of malaria RDTs/total number of laboratory staff who received a supervisory visit in the reporting period.	2.1–2.4	Providers demonstrate competence in RDTs and/or microscopy.	Activity reports	Semi-annually	90%	58.3% met the 90% target or above, with an average score of 89.2%	Target not reached; only 105 out of 180 observed laboratory staff performed at 90% or greater with respect to RDT administration. A single technician may have been observed multiple times. Unable to disaggregate by sex.
<b>Objective 2: Increased percentage of patients suspected to have malaria or febrile illness who receive a diagnostic test.</b>									
<b>Outputs</b>									
2.a*	Number of participants in OTSS lessons learned workshops.	Number of participants in OTSS lessons learned workshops.	2.8	Country has supervisory structures and implementation of supervision for malaria treatment.	Team supervision reports	Semi-annually	30	<u>27 total</u> 27 male	Three missing participants were called away to attend to Ministry of Health (MOH) responsibilities.

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status / values	Gaps analysis/notes
2.b	Percentage of targeted facilities with at least one clinical provider formally trained in RDTs in the past 12 months.	Number of targeted facilities with one or more clinical providers formally trained in RDTs in the past 12 months /total number of targeted facilities.	2.1–2.4	Providers demonstrate competence in RDTs and/or microscopy.	Team supervision reports	Semi-annually	80%	10.3%	Target not reached; only 16 out of the 156 clinical OTSS sites for which data are available for this report had at least one clinical provider trained in RDTs in the past 12 months.
2.c*	Percentage of targeted clinical providers who received training by supervisors on documented diagnostic errors in the reporting period.	Number of providers who received training by supervisors on documented diagnostic errors (according to team supervision reports) in the reporting period/total number of providers with documented errors in diagnostics during team supervision in the reporting period.	2.1–2.4	Providers demonstrate competence in RDTs and/or microscopy.	Team supervision reports	Semi-annually	80%	<u>122 total</u> 60 male 48 female 14 sex unknown	Results reflect the total number of on-the-job training provided by supervisors.
2.f	Updated pre-service laboratory curriculum.	Updated pre-service laboratory curriculum.	2.9	Providers demonstrate competence in RDTs and/or microscopy.	Team supervision reports	Semi-annually	Revised curriculum approved	Ongoing activity	Completed for PY2; revised curriculum approved.
<b>Intermediate outcomes</b>									
2.g*	Percentage of targeted providers demonstrating competence in RDTs.	Number of targeted clinical staff who score 90% or greater on supervisory checklists measuring the preparation and reading of malaria RDTs/total number of laboratory staff who received a supervisory visit in the reporting period.	2.1–2.4	Providers demonstrate competence in RDTs and/or microscopy.	Team supervision reports	Semi-annually	90%	65.6% met the 90% target or above, with an average score of 86.6%	Target not reached; only 107 out of the 163 observed clinical staff performed at 90% or greater with respect to RDT administration; unable to disaggregate by sex.

**Objective 3: Increased percentage of patients who receive appropriate treatment for malaria or other febrile illnesses, consistent with the result of the diagnostic test.**

**Outputs**

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status / values	Gaps analysis/notes
3.a	Country has national clinical supervision tools whose indicators adhere to global standards for determining possible malaria cases.	Country has national clinical supervision tools whose indicators adhere to global standards for determining possible malaria cases.	3.1	Country has supervisory structures and implementation of supervision for malaria treatment.	Team supervision reports	Semi-annually	Revised checklist meets global standards.	Completed	Revised clinical OTSS checklist used during round 13 OTSS.
3.b	Number of algorithm charts printed and distributed.	Number of algorithm charts printed and distributed for severe malaria, uncomplicated malaria, and non-malarial febrile illnesses.	3.2	Country has full national policies for malaria treatment.	Activity reports	Semi-annually	200	Pending	National Malaria Control Center has approved printing. Printing company awaiting final approval from MalariaCare.
3.c	Percentage of targeted facilities receiving at least two clinical supervisory visits per annum for malaria treatment.	Number of facilities receiving at least two clinical supervisory visits per annum for malaria treatment with WHO-recommended ACT/total number of targeted facilities.	2.1–2.4	Providers demonstrate competence in malaria treatment.	Team supervision reports	Semi-annually	80%	45.5%	Target not yet reached (additional rounds of OTSS are still scheduled); 71 out of 156 facilities visited within the current reporting period have been visited twice for clinical supervision.
3.d*	Percentage of targeted providers who received training in malaria treatment by supervisors in the reporting period.	Number of providers who received training in malaria treatment by supervisors based on documented errors in the reporting period/total number of providers who had documented errors during team supervision in the reporting period.	2.1–2.4	Providers demonstrate competence in malaria treatment.	Team supervision reports	Semi-annually	80%	32.3% 52 total 21 male 19 female 12 sex missing	Target not reached; trainings reported here were classified as case management training.

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status / values	Gaps analysis/notes
3.e	National pre-service curriculum for physicians and nurses revised.	Fever case management portions of the national pre-service curriculum for physicians and nurses revised.	3.3	Providers demonstrate competence in malaria treatment.	Team supervision reports	Semi-annually	Revised curriculum approved	Ongoing	Completed for PY2; revised curriculum approved.
<b>Intermediate outcomes</b>									
3.f	Percentage of targeted health facilities with malaria algorithm charts.	Percentage of targeted health facilities with malaria algorithm charts for severe malaria, uncomplicated malaria, and non-malarial febrile illnesses.	3.2	Country has full national policies for malaria treatment.	Activity reports	Semi-annually	100%	62.7%	Target not reached; 101/161 OTSS facilities were reported as having malaria algorithm charts (malaria case management/treatment guidelines).
3.h*	Percentage of targeted providers demonstrating compliance with treatment using WHO-recommended ACT for cases with positive malaria test results.	Number of providers who comply with treatment using WHO-recommended ACT for cases with positive malaria test results measured through direct observation during team supervision visits/total number of providers who received team supervision in the reporting period.	2.1–2.4	Providers demonstrate competence in malaria treatment.	Team supervision reports	Semi-annually	80%	--	Cannot be derived from OTSS data using current platform.
3.i*	Percentage of providers demonstrating adherence to negative test results according to global standards.	Number of providers demonstrating adherence to negative test results according to global standards measured through direct observation during team supervision visits/total number of providers who received team supervision in the reporting period.	2.1–2.4	Providers demonstrate competence in malaria treatment.	Team supervision reports	Semi-annually	80%	86.7% met the 80% target or above, with an average score of 83.7%	Target achieved; during the most recent round of OTSS, 1,346 clinical records were reviewed out of which 1,168 adhered to negative malaria test results (i.e., no malaria treatment was given).

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status / values	Gaps analysis/notes
3.j*	Percentage of targeted providers demonstrating compliance with treatment using WHO-recommended ACT for cases with positive malaria test results.	Number of providers who comply with treatment using a WHO-recommended antimalarial for cases with positive malaria test results during clinical assessment visits measured through direct observation during team supervision visits/total number of providers who received team supervision in the reporting period.	2.1–2.4	Providers demonstrate competence in malaria treatment.	Team supervision reports	Semi-annually	80%	--	Cannot be derived from OTSS data using current platform.
<b>Objective 4: Strengthened laboratory systems at the country level for detecting malaria and other infectious diseases.</b>									
<b>Outputs</b>									
4.a	Country has national laboratory supervision tools whose indicators adhere to global standards for laboratory system analysis.	Country has national laboratory supervision tools whose indicators adhere to global standards for laboratory system analysis.	3.1	Country has supervisory structures and implementation of supervision for malaria treatment.	Activity reports	Semi-annually	Revised checklist adheres to global standards.	Completed	Revisions completed.
4.b	Percentage of targeted facilities receiving at least two laboratory supervisory visits per annum.	Number of facilities receiving at least two laboratory supervisory visits per annum/total number of targeted facilities.	2.1–2.4	Reference laboratories and facilities able to provide high-quality diagnostics for malaria and other febrile illnesses.	Activity reports	Semi-annually	90%	60.2%	Target not yet reached (additional rounds of OTSS are still scheduled); 97 out of 161 facilities visited within the current reporting period have been visited twice for laboratory supervision.

Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status / values	Gaps analysis/notes
4.c	Malaria diagnostics QA/QC framework developed.	Malaria diagnostics QA/QC framework developed.	4.1, 4.2	Country has supervisory structures and implementation of supervision for malaria treatment.	Activity reports	Semi-annually	Malaria diagnostics QA/QC framework developed.	Nearly complete	Final framework will be submitted to the MOH and Ministry of Community Development/Maternal and Child Health (MCDMCH) for their final input early in PY3.
4.d	Integrated checklist with TB program developed.	Integrated checklist with TB program developed.	4.4	Country has supervisory structures and implementation of supervision for malaria treatment.	Activity reports	Semi-annually	Draft of integrated checklist submitted to stakeholders.	Not complete	MalariaCare visited the HIV/TB program to explore the possibility of integration; it was determined that currently little, if any, supervisory elements could be integrated from the TB program to the malaria program. MalariaCare will share the microscope inventory results with the TB program once they are finalized.
4.e	National laboratory register developed.	National laboratory register developed for improved monitoring of malaria case management.	4.5	Reference laboratories and facilities able to provide high-quality diagnostics for malaria and other febrile illnesses.	Activity reports	Semi-annually	National laboratory register developed.	Ongoing activity	Completed for PY2; standard laboratory registers developed in all OTSS sites.
4.f	National laboratory microscope inventory conducted.	National laboratory microscope inventory conducted (in conjunction with OTSS).	4.6	Reference laboratories and facilities able to provide high-quality diagnostics for malaria and other febrile illnesses.	Activity reports	Semi-annually	Report on national laboratory microscope inventory submitted to stakeholders.	In progress	Report will be finalized during ongoing OTSS rounds 13 and 14.



Intermediate outcomes									
Indicator ID	Indicator	Definition	Relevant activity #	Contributes to the following intermediate objective of MalariaCare	Data source	Frequency	Targets	Target status / values	Gaps analysis/notes
4.g	Percentage of targeted laboratories that meet global standards for high-quality malaria diagnostics.	Number of targeted laboratories that meet 90% or greater on re-checking of malaria slides during supervisory visits/total number of targeted laboratories that received a supervisory visit in the reporting period.	2.1–2.4	Reference laboratories and facilities able to provide high-quality diagnostics for malaria and other febrile illnesses.	Activity reports	Semi-annually	90%	78.9% met the 90% target or above, with an average score of 95.1%	Target not reached; only 56 out of the 71 reporting OTSS sites had 90% or greater agreement on malaria slide re-checking compared to OTSS supervisor results.
Project management: Assure the visibility and support the mission of PMI through strong partner relationships.									
Outputs									
5.a	Number of OTSS data input technicians hired.	Number of OTSS data input technicians hired.	2.5	Assure the visibility and support the mission of PMI through strong partner relationships.	Activity reports	Semi-annually	6	<u>6 total</u> 5 male 1 female	Target reached.



PRESIDENT'S MALARIA INITIATIVE

