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## PRESIDENT'S MALARIA INITIATIVE



# Improving Malaria Diagnostics FY09 Semi-Annual Report

COOPERATIVE AGREEMENT: GHS-A-00-07-00022-00  
MEDICAL CARE DEVELOPMENT INTERNATIONAL

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## Abbreviations

CDC	Centers for Disease Control and Prevention
CSReF	Centre de santé de référence (Reference/District Hospital)
EQA	External Quality Assurance
GFATM	Global Fund to Fight Aids, Tuberculosis, and Malaria
HIV/AIDS	Human Immunodeficiency Virus/ Acquired immune deficiency syndrome
HSSP	Health Services and Systems Program
IDSR	Integrated Disease Surveillance and Response
IMaD	Improving Malaria Diagnostics
INRSP	Institut Nationale de Recherche en Sante Publique
LAMLT	Liberia Association of Medical Laboratory Technology
LIBR	Liberian Institute of Biomedical Research
M&E	Monitoring and Evaluation
MACEPA	Malaria Control and Evaluation Partnership in Africa
MCDI	Medical Care Development International
MOH	Ministry of Health
MOH&SW	Ministry of Health and Social Welfare
MOP	Malaria Operational Plan
MRTC	Malaria Research and Training Center
NMCC	National Malaria Control Center
NMCP	National Malaria Control Program
NPHL	National Public Health Laboratory
NPHRL	National Public Health Reference Laboratory
PEPFAR	President's Emergency Plan for AIDS Relief
PMI	President's Malaria Initiative
PNLP	Programme National de Lutte contre le Paludisme
PISF	Projet intégré d'Appui à la Santé Familiale
QA	Quality Assurance
QHP	Quality Health Partners
RDT	Rapid Diagnostic Test
SOP	Standard Operating Procedure
TB	Tuberculosis
TNIMA	Tubman National Institute of Medical Arts
USAID	United States Agency for International Development
WHO	World Health Organization

## **Executive Summary**

In compliance with the requirements of the Cooperative Agreement GHS-A-00-07-00022-00, MCDI hereby submits the following as a semi-annual progress report on the activities, accomplishments and plans for the “Improving Malaria Diagnostics” (IMaD) project.

In accordance with individual country Malaria Operational Plans (MOPs), IMaD’s activities fall within the following major technical assistance categories as applied to strengthening the laboratory diagnosis of malaria:

- Laboratory baseline assessment
- National malaria policy development
- Training
- Quality Assurance
- Procurement assistance

During fiscal year 2008, IMaD focused on activities related to scale-up. These activities included laboratory assessments in seven PMI countries and meetings with members of Ministries of Health, national malaria control programs, public health and national reference laboratories, and training institutions to gain an understanding of health service structures. The information provided an overview of clinical and laboratory staff training and supervision, quality management systems, staffing levels, monitoring and evaluation systems and coordination with vertical disease programs that was used in the development of program work plans. In the latter part of the 2008, IMaD focused heavily on the utilization of laboratory assessment data to develop national malaria diagnostic policy and deliver targeted training to supported PMI countries.

Building strong in-country relationships is critical to successful program implementation. Recognizing the need for in-country support, IMaD worked diligently throughout the last fiscal year and during the first half of the current fiscal year to build complementary partnerships to ensure program success. In Benin, IMaD has formed partnerships with the MOH National Malaria Control program (including World Bank Booster Program) and Projet intégré d’Appui à la Santé Familiale (PISAF), an organization delivering clinician training and supervisory services throughout the country. While in Mali, IMaD will work with partners Programme National de Lutte contre le Paludisme (PNLP), Institut Nationale de Recherche en Sante Publique (INRSP) and ABT Associates in-country project, ATN Plus, to finalize clinical and laboratory training materials and carry out training in-country. In Zambia, IMaD will collaborate with the Malaria Consortium and the PATH Zambia project, MACEPA (discussions in progress), on quality assurance activities and to provide logistical support for program administration and training.

In addition, IMaD has scaled up its capacity on the local level by hiring in-country program coordinators for Benin, Ghana (in progress) and Liberia (in progress). Local representatives will receive orientation and training to provide program management services that will contribute to USAID's goals of technology transfer to increase in-country capacity during the course of PMI and PEPFAR programs.

Prior to initiating capacity-building assistance, IMaD collected data on current levels of services through a combination of surveys and assessments. During the first part of this fiscal year, IMaD has assessed 1233 facilities in seven countries. Furthermore, these data have been used to identify major gaps in staffing, training, supplies and equipment. This information aided development of targeted training and evaluation programs in seven PMI countries. To date, more than 100 health care staff have been trained or assessed through proficiency testing, job aids have been developed in multiple languages and equipment to support malaria diagnosis is currently being procured. Finally, a major accomplishment of this fiscal year's activities was IMaD support for the development of an external accreditation program for malaria microscopy. Developed in conjunction with WHO and other partners, the External Competency Assessment of Malaria Microscopists will provide a core group of expert microscopists, accredited to internationally recognized standards and capable of assessing, validating and training health care workers around the globe.

During the remainder of this fiscal year, IMaD will embark on several policy development, training and evaluation activities. These will include large RDT evaluations in Liberia and Madagascar based on recently developed protocols, as well as Outreach Training in Angola, Benin, Ethiopia, Ghana and Zambia.

This report covers the major planning phase of FY2008 and is divided into four sections: 1) detailed activities concerned with each program objective; 2) specific major accomplishments; 3) major challenges and suggested solutions; and 4) IMaD's planned activities for the coming year.

The FY2009 Semi-Annual Report forms the foundation for the third and fourth quarters of FY2009, the major implementation and scale up phase of the IMaD Project.

## **Program Overview by Country**

As in previous reports, each country is reviewed in terms of program objectives, accomplishments and activities. In addition, the major challenges are described for each project and where possible, solutions have been proposed. Finally, each country's section includes a summary of the immediate future steps (way forward).

### **PROGRAM OVERVIEW GHANA**

#### **I. Description of program objectives, accomplishments and activities.**

##### ***Program Objectives:***

1. Assist in the development and implementation of microscopy and RDT guidelines;
2. Facilitate laboratory quality control and supervision of public sector health facilities.

##### ***Accomplishments:***

- Attended a 2-day national stakeholders meeting (January 2009) to review the National Guidelines for Laboratory Diagnosis of Malaria and Standard Operating Procedures (SOPs).
- Visited Ghana and revised the IMaD Laboratory and Clinical Training Materials to support upcoming Outreach Supervision Training (February);
- Provided support for 3 meetings of the TWG /NMCP to advance the National Guidelines for Laboratory Diagnosis of Malaria (March-April);
- Placed orders (at DELIVER) for essential laboratory equipment and supplies (April);
- Submitted local newspaper advertisements for IMaD/Ghana in-Country Coordinator position (March);
- Finalized IMaD Laboratory and Clinical Training Materials in preparation for upcoming training (May);

##### ***Activities***

#### **National Guidelines for Laboratory Diagnosis of Malaria**

The National Guideline document for Laboratory Diagnosis of Malaria is in the final stages of review by the NMCP and stakeholders. The CDC, supporting PMI-Ghana and the WHO have provided the team with technical input and the document is currently in alignment with best practices and international standards. Language from the document is being used to standardize guidance on diagnostics in other NMCP draft documents. Final revisions will be made to the document before going to print (June 2009). The IMaD team is finalizing a section about RDT validation that will be circulated among the stakeholders to gain consensus. In

addition, the team will incorporate WHO guidance contained in the recent results of the WHO product testing of malaria RDTs: Round 1 report [1]. The team will also look to broader PMI guidance for RDT validation protocols. Finally, the stakeholders feel that this document may ultimately serve as a template for laboratory diagnosis of malaria in other PMI countries.

#### IMaD Laboratory and Clinical Supervision Training Materials (February-March 2009)

During February and March 2009, an IMaD team member visited Accra and co-facilitated a meeting involving the NMCP and other stakeholders to review the IMaD Laboratory and Clinical Supervision Training Materials. The purpose of the visit was also to confirm that planning for the IMaD Outreach Supervision Training was progressing on schedule and to meet with the appointed laboratory and clinical points of contact. During the March visit, the NMCP determined that the team was not employing the appropriate institute to represent the clinical component of Outreach Supervision. Since the March visit, the IMaD team has worked with the National Public Health Reference Laboratory (Mr. Ekow Biney) and Institutional Care (Dr. Bannerman and Susan Wumbee) to select the laboratory and clinical supervisors, respectively. The training materials were finalized by the technical working group during a one day meeting held in early May 2009. Training materials have been printed in preparation for the upcoming Outreach Supervision Training.

#### Specification of essential laboratory equipment and supplies for DELIVER (April)

The IMaD team finalized the laboratory assessment report based on 40 health facilities representing the 10 administrative regions in Ghana (June, 2008). Based on the results of the assessment exercise, IMaD provided a list of essential clinical and laboratory diagnostic equipment and supplies, technical specifications and quantities to DELIVER. Currently, the DELIVER project is preparing a Commodity Procurement Information Request (CPIR) for the mission and the MOH to review, amend and sign. DELIVER will then begin the tendering process. IMaD is working with the DELIVER project to develop a customized malaria microscopy kit that captures both laboratory and basic essential clinical diagnostic equipment. The team hopes to have this kit ready for the next procurement cycle.

#### Logistical Planning for Outreach Supervision Training

Outreach Supervision Training is scheduled to occur during the first week of June. A total of forty participants have been identified by the NPHRL (twenty laboratory supervisors) and Institutional Care (twenty clinical supervisors). In addition, local facilitators have been identified to serve as instructors for sessions relating to their field of expertise for both the laboratory and clinical modules. IMaD has developed a draft PowerPoint slide presentation to accompany each module of the curriculum and provided the NMCP, laboratory and clinical focal persons with a soft copy for review and orientation.

The Outreach Supervision training course will run for 5.5 days with daily joint sessions for clinical and laboratory cadres to address cross-cutting issues. Separate theory and practical sessions will be held for the laboratory and clinical participants to address specific topics relating to their field. Practical sessions will be held at the NPHRL and Korle–Bu Hospital. An on-site supervision exercise will occur at two separate health facilities to give the participants an opportunity to practice using the supervisory checklists. At the end of the Outreach Training course, a joint work plan will be developed by clinical and laboratory supervisors from each Region outlining their activities for the next quarter. The plans will be submitted to the NMCP for review and approval.

### IMaD/Ghana In-Country Coordinator for Ghana

A scope of work and job description was developed by the IMaD team and PMI–Ghana. The advertisement will be posted to local newspapers for a two week period. Quality Health Partners (PMI Partner) has agreed to screen candidates for IMaD’s review. The main role of the IMaD/Ghana in-country coordinator is to facilitate timely implementation of IMaD Ghana’s annual work plan. To this end, the Coordinator will liaise with and maintain productive collaborative relationships with in-country partners, namely: (1) the PMI/Ghana team, housed at USAID Ghana; (2) the Ghana Health Service, including the National Malaria Control Program, the National Public Health Reference Laboratory; the Institutional Care Division, and other departments; and (3) other PMI/Ghana implementing partners, especially those working in procurement (e.g. DELIVER) and case management (such as QHP, SPS, and the New Malaria RFA); and (4) other stakeholders in malaria diagnostics, such as professional associations, private sector representatives and the WHO country office. The IMaD/Ghana in-country coordinator will support and follow up on assignments carried out by IMaD’s partners. Their duties will include providing assistance with coordination, logistics and communication including the organization of training, workshops and other events, and data collection for monitoring and evaluation including the numbers of supervisory visits made, people trained, reports disseminated and other products. In addition, the IMaD/Ghana in-country coordinator will work with the IMaD regional and headquarters staff to plan for and ensure successful execution of IMaD technical assistance, including TDY visits and virtual support during a minimum of bi-weekly teleconferences and through regular activity reports.

## **II. Program challenges and solutions**

Based on the MOPs and field experience to date, the team believes the following areas could potentially create a challenge to our established goals:

- Complexity of working without in-country presence.

The IMaD/Ghana in-country coordinator will ensure the project maintains momentum while the core team is away. In addition, the IMaD/Ghana coordinator will attend stakeholder meetings and brief the NMCP regularly ensuring IMaD maintains traction while providing adequate support to the program objectives.

### **III. Outline of Way Forward:**

Over the course of the next six months, IMaD will complete a number of laboratory strengthening exercises in Ghana. The National Guidelines for Laboratory Diagnosis of Malaria will be finalized as will the customization of the malaria microscopy kit. Comprehensive outreach supervision training to Ghana MOH staff is due to take place in June and will be followed by the development of a work plan and schedule for IMaD Outreach Supervision. Finally, an IMaD/Ghana In-country Coordinator will join the IMaD project and receive training and orientation.

## **PROGRAM OVERVIEW LIBERIA**

### **I. Description of program objectives, accomplishments and activities.**

#### *Program Objectives*

1. Assist with the development of the National Reference Laboratory
2. Train laboratory technicians in malaria diagnostics
3. RDT supervision, monitoring, and evaluation
4. Hire IMaD/Liberia In-Country Coordinator

#### *Accomplishments*

- Finalized list of essential laboratory and essential clinical diagnostic equipment
- Submitted contract to PMI-Liberia and MOH&SW IMaD/Liberia In-Country Coordinator (Mr. Henry Kohar)

#### *Activities*

#### **List of essential laboratory and essential clinical diagnostic equipment**

A decision has been taken to develop an integrated national public health reference laboratory at the Liberian Institute of Biological Research (LIBR), the former national research institution established in 1975. The LIBR is situated about 1 hour's drive from Monrovia and is currently non-functional.

An evaluation of the LIBR was performed by WHO AFRO in December 2007, specifically to establish capabilities for virology/serology (for HIV services) and microbiology (for diarrheal

diseases). Complete refurbishment of the laboratory buildings are expected to be funded by the Global Fund. Work was to commence this year. All laboratory support units for disease control programs will be relocated to the LIBR, including the reference laboratory for the National Malaria Control Program supporting diagnosis and quality assurance.

The team has developed a list of essential laboratory and essential clinical diagnostic equipment for malaria diagnosis. Once IMaD receives confirmation regarding the status of the LIBR and receives approval from the MOH&SW, the team will make a recommendation to the DELIVER project to prepare a CPIR for review and amendment by the mission and the MOH. When a final version of the CPIR is agreed upon, the mission and the MOH will sign the document and DELIVER will then begin the tendering process before the end of the fiscal year.

#### IMaD/Liberia In-Country Coordinator

The team will identify an IMaD/Liberia In-Country Coordinator to assist with on the ground implementation of the IMaD workplan. The team will identify a third party national from Ghana or ideally a repatriate of Liberia to fill this position. A scope of work and job description was developed by the IMaD team. The main role of the IMaD/Liberia In-Country Coordinator is to facilitate timely implementation of IMaD Liberia's annual work plan. To this end, the Coordinator will liaise with and maintain productive collaborative relationships with in-country partners, namely: (1) the PMI/Liberia team, housed at USAID Liberia; (2) the National Malaria Control Program (3) other PMI/Liberia implementing partners, especially those working in procurement (i.e. DELIVER) and case management (such as Mentor Initiative); and (4) other stakeholders in malaria diagnostics, such as professional associations, private sector representatives, the WHO country office, etc. The IMaD/Liberia In-Country Coordinator will support and follow up on assignments carried out by IMaD's partners, filling the needs for assistance with coordination, logistics, communication, administrative and logistical tasks such as the organization of training, workshops and other events, and tracking program deliverables (supervisory visits made, people trained, reports disseminated and other products). In addition the IMaD/Liberia In-Country Coordinator will work with the IMaD regional and headquarter staff to coordinate IMaD technical assistance, including TDY visits and virtual support during a minimum of bi-weekly teleconferences and through regular activity reports.

## **II. Program challenges and solutions**

Based on the MOPs and field experience to date, the team believes the following areas could potentially create a challenge to our established goals:

- Complexity of working without in country presence
- Shortage of trained clinical and laboratory supervisors

The IMaD/Liberia In-Country Coordinator will ensure the project maintains momentum while the core team is away. This is especially important in the case of Liberia where there are a limited number of skilled professionals. The team hopes to reach a solution with the MOH&SW over the next month regarding Mr. Kohar, who is viewed to have both technical and managerial capacity. If no agreement can be made the team will strive to identify an alternative hire.

IMaD will use qualified clinical and laboratory staff from both public and private health facilities to fill the supervisory gap in the short to medium term.

### **III. Outline of Way Forward:**

- Come to agreement with the MOH&SW regarding Mr. Kohar as IMaD/Liberia In-Country Coordinator
- Finalize contract with the MENTOR Initiative (financial instrument to support in-country coordinator)
- Work with IMaD coordinator to develop a work plan and schedule for IMaD Outreach Supervision and Training (microscopy and RDTs)

## **PROGRAM OVERVIEW MADAGASCAR**

Due to civil unrest in the country, the USG has postponed all activities in collaboration with the Government of Madagascar. All future activities are contingent on USAID's re-engagement with the government of Madagascar.

### **I. Description of program objectives, accomplishments and activities.**

#### ***Program Objectives:***

1. Performance of a baseline assessment of malaria laboratory diagnostic capacity and infrastructure;
2. Development and implementation of microscopy and RDT policy;
3. Provide support to the NMCP to finalize and implement written guidelines for the laboratory diagnosis of malaria;
4. Training of laboratory technicians and clinicians through outreach supervision visits (in-service training);
5. Provide support to the NMCP for laboratory supervision (EQA);
6. Conduct a RDT assessment in collaboration with IPM, CDC, NMCP, SanteNet.

#### ***Accomplishments:***

- The IMaD team visited 15 facilities and conducted a baseline laboratory assessment of 12 sites to determine current laboratory capacity at health facilities under the jurisdiction of the MOH (May 2008).
- IMaD designed a protocol to conduct an assessment of RDT use at 30 health centers on the east coast of Madagascar. An ethical review of this protocol was conducted at the Centers for Disease Control (March 2008).

### ***Activities***

Drs. Jane Carter, Luis Benavente and Daouda Ndiaye visited Madagascar to conduct the baseline assessment. In addition to the laboratory assessment visits, the team met with members of the MOH, NMCP and training institutions to understand Madagascar's national systems for health services structure; training of clinical/laboratory staff; supervisory systems; Quality Assurance (QA) systems; staffing levels; records/Monitoring and Evaluation (M&E); and coordination with vertical disease programs.

After the baseline assessment was performed, a detailed scope of work was developed for a nationwide RDT assessment and the process of hiring enumerators initiated. The CDC resident advisor was designated as the Principal Investigator for the assessment. The start of the full assessment has been delayed because of social unrest in Madagascar.

### **II. Program challenges and solutions**

Based on the MOPs and field experience to date, the team believes the following areas could potentially create a challenge to our established goals:

- Due to civil unrest in the country, the USG has postponed all activities in collaboration with the Government of Madagascar.

The completion of a full laboratory RDT assessment, development of national guidelines, outreach training and clinical supervision has been put on hold and all future activities are contingent on USAID's re-engagement with the government of Madagascar.

### **III. Outline of Way Forward**

IMaD's prime partner, MCDI has strong in-country presence in Madagascar and enjoys very good relations with the MOH. The IMaD team will seek to hire an IMaD/Madagascar in-Country Coordinator to oversee in-country activities and provide day-to-day logistical support. The team will work quickly to expedite the identification and hiring of process due to MCDI's local office support (pending Mission approval).

## **PROGRAM OVERVIEW ZAMBIA**

### **I. Description of program objectives, accomplishments and activities.**

#### ***Program Objectives:***

1. Together with the MoH and NMCC, conduct a comprehensive review of written guidance and use of diagnostic procedures for malaria;
2. Harmonize MOH and IMaD training documents and develop a training manual for both laboratory and clinical activities;
3. Develop and implement a plan for quality assurance of malaria laboratory diagnosis;
4. Conduct initial and refresher training and facilitate supportive supervision of laboratory workers in malaria diagnosis;
5. Conduct training and facilitate supportive supervision of health workers to increase their confidence in, and use of, malaria test results to guide treatment;
6. Evaluate changes in performance of and adherence to lab diagnostic tests to monitor program productivity.

#### ***Accomplishments:***

- Conducted a meeting to support Outreach Supervision planning and logistics (April)
- Convened a meeting of the Zambia Laboratory Core Group to review IMaD Laboratory Training materials and prepare for the Outreach Supervision training course and supervisory visits.
- Agreed upon a timetable to review and harmonize all training materials and documents, in collaboration with the NMCC, and to hold a stakeholders meeting to finalize documents in July 2009. These documents include:
  - IMaD Generic Curricula and timetables (clinical and laboratory)
  - IMaD Checklist Tools (clinical and laboratory)
  - IMaD Generic Policy Document
  - IMaD QA Protocol for malaria slides
  - Zambia Curriculum Chart and Detailed Syllabus for Malaria Microscopy
  - Zambia Diagnosis of Malaria Course Curriculum
  - Zambia QA Guidelines
- Initiated discussions with the Malaria Consortium and MACEPA to explore various options and partner requirements for establishing in-country logistical support.

#### ***Activities***

##### **Laboratory Core Group Meeting**

The NMCC and IMaD co- facilitated a meeting with 7 members of the laboratory core team comprising members of NMCC-partner organizations within Lusaka on 21 – 22 April. This meeting was initially planned as a policy review, however the laboratory core group expressed the need for:

1. A review of all training materials and policy guidelines developed by IMaD
2. Harmonization of IMaD materials and all MOH diagnostic materials currently being used in Zambia

The outcome of the core group meeting was a timeline in which the laboratory core group, and the clinical core group, would meet as follows: (dates subject to slight change)

- 10 - 22 May: review and provide feedback to the IMaD team on diagnostic materials
- May 22 – 29 June: IMaD team to review and provide feedback to the NMCC on diagnostic documents
- 14 – 15 July: IMaD to support stakeholders meeting to finalize all NMCC diagnostic materials.

#### **Training and Outreach Coordination Visit**

The IMaD team visited Zambia during 22 – 24 April, to prepare for the Outreach Supervision training of outreach supervisors. The following issues were agreed upon with the NMCC:

- IMaD will draft a list of equipment and supplies necessary for the training and provide this to the NMCC
- The training will be held in Kabwe, the capital of Central Province, and both the laboratory and clinical practical sessions will be held at Kabwe Provincial Hospital
- Focal people for preparation of the outreach training will be Moonga Hawela – laboratory, and Dr. Mulakwa Kamuliwo – clinical
- 18 laboratory and 18 clinical participants (2 from each province) will be selected
- The outreach training course will take place the week of August 10, 2009 with the outreach program will follow within two weeks
- Selection of supervisors will be in collaboration with Provincial Heads to ensure supervisors are able to conduct outreach visits in addition to existing work

The IMaD team also met with the Malaria Consortium while in Lusaka to discuss points of collaboration. The Malaria Consortium has expressed an interest to work with the IMaD project on laboratory quality assurance and support supervision activities.

## **II. Program challenges and solutions**

Based on the MOPs and field experience to date, the team believes the following areas could potentially create a challenge to our established goals:

- Staff shortages at the MOH

Work with the MOH and Provincial Health Management Teams to ensure that IMaD will only select laboratory and clinical health workers as supervisors whose daily duties will not be interrupted by conducting out of station supervisions (up to 9 days per quarter).

- Complexity of working without in country presence

IMaD is currently discussing with PMI the possibility of hiring an IMaD/Zambia in-country coordinator. The following three options have been discussed and will be reviewed over the coming weeks:

- Increasing the number of TDYs of an African-based IMaD team member, Emanuel Yamo (IMaD Project Officer)
- IMaD to support salary (PT/FT) of a local NGO staff member who will focus on IMaD activities
- Hire FT IMaD/Zambia in-country coordinator

## **III. Outline of Way Forward**

The IMaD team will seek to finalize a Memorandum of Understanding with MACEPA to support the project as an in-country logistical partner. Additionally, IMaD team members will work with the NMCC on the review and harmonization of MOH and IMaD training materials. All feedback on these materials will be submitted to IMaD by the end of May 2009. IMaD will support stakeholders meetings for the laboratory and clinical core groups during July 2009 to finalize and harmonize all documents. The training of 18 laboratory and 18 clinical supervisors (2 from each of the 9 provinces) will take place during the week of August 10, 2009 with the first round of outreach supervision to follow in all 9 provinces within 2 weeks of the Outreach Supervision Training course. IMaD will draft a list of equipment and supplies necessary for the training and provide this to the NMCC for planning purposes. The outreach supervision program will also serve as an expanded assessment in which health facility capacities will be documented.

IMaD is currently determining, in collaboration with the PMI Mission, the most efficient mechanism for an in-country coordinator in Zambia. The three options outlined in objective 2

above have been discussed and budgets will be drafted for consideration. Once the most efficient mechanism is determined IMaD will move quickly to finalize the position so that activities continue on-schedule.

IMaD will determine the feasibility of a study to review the performance of microscopists in all provinces in reading positive and negative slides, to focus on microscopists' ability to identify malaria correctly and to distinguish other blood parasites (such as *Borrelia* and trypanosomes).

## **PROGRAM OVERVIEW ANGOLA**

### **I. Description of program objectives, accomplishments and activities.**

#### ***Program Objectives:***

1. Conduct initial and refresher training and facilitate supportive supervision of laboratory workers in malaria diagnosis;
2. Laboratory supervision (to include external quality control): support to the NMCP to improve supervision and quality control of public sector laboratories.
3. Procurement assistance to Deliver project for microscopes and laboratory supplies

#### ***Accomplishments:***

- Revised, translated, and printed 120 copies of the DPDx (CDC) malaria diagnostic bench aids for use by technicians in Angolan health facilities. The bench aids are A-4 sized laminated sheets and cover *Plasmodium falciparum*, *vivax*, *malariae* and *ovale* and Babesia, as well as pictorial procedures for blood collection and slide preparation (February) .
- Shared electronic version of the IMaD Outreach Supervision curriculum with Dr. Caroline Ferreira, INSP for review (February)
- Identified 2 focal people to assist with Outreach Supervision training; Dr. Carolina Ferreira, INSP and Dr. Raphael Dimbu , NMCP (March)
- Confirmed dates for Outreach Supervision training (22-26 June) with the INSP, MOH, and Mission (March )
- Identified 5 provinces to begin Outreach Supervision training: Huambo, Kwanza Sul, Kwanza Norte, Malange, Uige and Zaire.
- Shared hard copies of the IMaD Outreach Supervision curriculum with Dr. Dimbu (March)
- Printed 150 poster sized compilations of the above listed bench aids for ease of reference (April)

## **Activities**

### **Training Material: Bench Aids and Posters for Laboratory Staff**

Bench Aids for all 4 human Plasmodium species and Babesia and procedural bench aids for malaria microscopy were revised and translated into Portuguese by the IMaD team. One hundred and twenty copies were laminated and printed for distribution. In addition posters depicting the 4 human malaria species and malaria microscopy procedures were revised and translated into Portuguese. One hundred and fifty posters were laminated and printed to be distributed to the health facilities. Dr. Carolina Ferreira, IMaD's point of contact for the laboratory, reviewed and approved the translated bench aids and posters. These materials will be sent to Angola for distribution at GOA health facilities in early June.

### **Visit 2: March 2009 (IMaD Director Dr. Luis Benavente)**

A meeting was held with the PMI CDC resident advisor, Jules Mihigo, at the NMCP at which the IMaD scope of work was reviewed and approved. However, Dr. Mihigo warned that scaling up supervision to provinces outside of Luanda might be difficult due to the insufficient number of supervisors identified for training. The INSP and PMI team agreed that Outreach-trained laboratory supervisors would be positioned in 5 targeted provinces: Huambo, Kwanza Sul, Kwanza Norte, Malange, Uige and Zaire. Once in place, the program could be expanded to include other provinces. The IMaD team proposed integrated supervision (with other vertical disease programs) to save on the fuel and vehicle costs. Dr. Mihigo supported the plan for integrated supervision despite the fact that the NMCP was not entirely supportive of this concept. The team will work with Mentor and Chemonics (two locally based NGOs) to identify points of collaboration and present a way forward to the NMCP. Dr. Carolina Ferreira, the laboratory point-of-contact (POC) at the INSP for IMaD activities in Angola, has been difficult to reach due to WHO consultancy commitments and other personal issues. Therefore, Dr Pedro Rafael Dimbu, a biologist working at the NMCP (under Dr. Filomeno Fortes) agreed to co-facilitate the outreach training and become IMaD's main point of contact in the absence of Dr. Carolina. Dr Dimbu is a strong replacement as he is currently engaged in several activities funded by PMI, which include supervision of laboratories in the Luanda area. Dr Dimbu has also expressed an interest to take an active role in QA of microscopy.

## **II. Program challenges and solutions**

Based on the MOPs and field experience to date, the team believes the following areas could potentially create a challenge to our established goals:

- Complexity of working without in-country presence.
- Shortage of trained laboratory supervisors

Program coordination should improve with the introduction of Dr. Dimbu. However, Dr. Dimbu is tasked with many other PMI related activities in addition to his day to day work. IMaD will explore the possibility of hiring an IMaD/Angola In-country Coordinator with the Mission. The team feels this is the best way to ensure the project maintains momentum while the core team is away. In addition, the IMaD/Angola coordinator will attend stakeholder meetings and brief the NMCP regularly ensuring IMaD maintains traction while providing adequate support to the program objectives. In addition, significant lead time is required to make arrangements for in-country visits and the organization of in-country training is hampered by communication problems, heavy traffic and lack of adequate transportation. Due to these constraints, program activities will be best supported by local in-country coordination.

The initial supervisory activities will be limited to 5 provinces.

### **III. Outline of Way Forward**

#### **Rationale for Outreach Supervision Model**

We believe that the proposed model of Outreach Supervision training and regular support supervisory visits is the fastest and most effective way of reaching as many peripheral laboratory workers as possible, and should demonstrate an immediate impact on diagnostic capacity. Trainers for the outreach supervision course will need to be identified as soon as possible.

#### **Laboratory Trainers**

A group of laboratory supervisors are currently stationed at the INSP in Luanda. IMaD would like to use this group of laboratory supervisors to run the Outreach Supervision Course. The teams feel this cadre may be well positioned to run this section of the course as they currently hold supervisory roles and have recently participated in CDC sponsored training. These individuals are believed to be at a high level of proficiency to be able to present IMaD training material after receiving an initial sensitization. Pursuant to Dr. Benevente's most recent visit, Dr. Raphael Dimbu has agreed to identify the trainers in conjunction with Dr. Filomena.

#### **Identify Laboratory Provincial Supervisors (participants)**

IMaD recommends that two laboratory staff from each of the provinces where sentinel sites have been established are identified to become "Outreach Supervisors ". The team envisions Dr. Filomena and the INSP will identify these staff based on professional qualifications, prior experience, and personalities. The "Supervisors" will not be drawn from the sentinel sites themselves but from health facilities within the province. The team is proposing to start Outreach Supervision in provinces where there are sentinel sites as it is crucial to provide routine supervision to these sites as well as the surrounding health facilities.

### Participants' characteristics

If possible, trained laboratory staff should hold a Certificate, Diploma or Degree in Medical Laboratory Technology or one of its specializations; with several years' practical experience in the field. Participants should have management responsibility for supervising laboratory operations at Provincial or District levels.

### Outreach Refresher Training for Lab Supervisors

A six day training course will be run for laboratory cadres only. The team recommends choosing a venue in a secondary site (Benguela or Lobito) due to the difficulty in securing a hotel and the heavy traffic normally found in Luanda. Dr. Miguel Torres, technical consultant, will arrive in Angola early June, 2009 to support this effort.

### Technical Assistance to support Outreach Refresher Training (1-3 months)

The team understands the current work load that is placed on Dr. Filomena of the INSP and would like to recommend an in-country IMaD technical assistance person while the program is in the early stages, to work with an MOH staff member appointed by the INSP.

It is envisioned that this person will perform the following activities in concert with an appointed MOH staff member:

- Assist in the coordination and expansion of the outreach schedule;
- Accompany supervisors on initial visits and modify the program based on observed gaps, obstacles, feedback, and challenges;
- Liaise with the NMCP to ensure that the information collected by the Outreach Supervisors is disseminated properly to all data collection points (i.e. HMIS);
- Provide technical support to the INSP for the "Outreach Supervision" program.

## **PROGRAM OVERVIEW MALI**

### **I. Description of program objectives, accomplishments and activities.**

#### ***Program Objectives:***

1. Collaborate with the Malaria Research Training Center (MRTC) in laboratory training, development of job aids and training materials
2. Support MRTC in establishing a system of Quality Control for diagnostics at Sentinel Sites
3. Support LNS, ATN Plus, PNLP and INRSP in conducting training and establishing a system of Quality Control of microscopy and RDTs

**Accomplishments:**

- Supported Malaria Research Training Center (MRTC) in assessing 5 Sentinel Sites:
- Supported MRTC in training of laboratory managers and laboratory technicians from 5 Sentinel Sites.
- IMaD conducted a training and outreach coordination planning visit in February 2009.
- Conducted a laboratory training materials harmonization workshop in March 2009
- Identified IMaD training focal points:
  - a. Mr. Djiré Yacoba, PNLN – Clinician Training
  - b. Professor Sideye Maiga, INRSP – Laboratory Training

**Activities:****MRTC Sentinel Site Assessment and Training**

An assessment was conducted during 1 - 31 October by the MRTC in 5 Sentinel Sites. The assessment covered human resources, clinical services, laboratory services, equipment, supplies, consumables and ascertained the number of beds at each facility. This assessment was conducted by MRTC and PNLN staff. A report of the assessment was produced by the MRTC

IMaD supported the MRTC and PNLN staff in Bamako to conduct a training of 8 health workers from 7 – 11 October 2008. The training was held at the Department of Epidemiology of Parasitic Disease in the University of Bamako's Department of Medicine. The objectives of this training were to review:

- The *Plasmodium* life cycle
- Pathophysiology of malaria infection
- Clinical symptoms of malaria
- Malaria microscopy including blood film preparation (blood collection, slide preparation, staining), examination, parasite identification and quantification
- RDT use, preparation and interpretation
- Principles of good laboratory practices

The participants included: 5 laboratory technicians, 2 pharmacists, and 1 medical assistant.

Staff from the MRTC and PNLN also conducted training of 86 health workers from sentinel sites from 4 – 10 May 2009. The objectives of the training were to review:

- Epidemiological concepts (prevalence, incidence, monitoring, etc.)
- Importance of monitoring activities at sentinel sites

- Steps of malaria monitoring
- Case management including patient identification, data management, reporting, and feedback from sentinel sites
- Collection of complete and reliable malaria data from sentinel sites
- And RDT (Paracheck) use, preparation and interpretation

There were 86 participants trained: 15 from Commune IV, 15 from Kita, 22 from Kadiolo, 18 from Sélingué, 16 from Djénné.

### IMaD Training and Outreach Coordination Visit

The IMaD team conducted a training preparation and outreach coordination visit from 23 – 26 February 2009. During this visit, the IMaD team met with Mission Staff, the National Malaria Control Program (PNLP), Assistance Technique Nationale (ATN), Institut National de Recherche en Santé Publique (INRSP) and Santé Sud. For its outreach program, IMaD will work with existing supervisors who have already received training and meet the IMaD criteria for supervisors. The Mission has proposed that the supervision program begins as a monthly program and proceed as an integrated program, with INRSP’s HIV and TB supervision program, where feasible.

IMaD and PMI agreed that Dr. Daouda Ndiaye, UCAD Senegal, will increase his TDYs to Mali in place of an IMaD in-country coordinator. Additionally, the IMaD team identified Dr. Safoura Berthe (PNLP Division of Diagnostics and Treatment) as the focal person for IMaD activities in Mali.

INRSP will partner with IMaD for the laboratory training and outreach program and ATN Plus will partner with IMaD for the clinical training and outreach program. Santé Sud clinicians may also participate in IMaD’s outreach program

## **II. Program challenges and solutions**

Based on the MOPs and field experience to date the team believes the following areas could potentially create a challenge to our established goals and is working to:

- Complexity of working without in country presence

IMaD will increase the TDYs of Dr. Daouda Ndiaye to oversee activities and ensure that the sentinel sites, training workshop and outreach programs are moving forward as planned.

## **III. Outline of Way Forward:**

IMaD will finalize the second Terms of Reference (TOR) with MRTC to run the supervision program at 5 sentinel sites which include:

- Commune IV
- Kita
- Kadiolo
- Sélingué
- Djénné

IMaD will work with MRTC and PNLP to draft a list of equipments and supplies for the 54 CSRef (59 minus the 5 Sentinel sites). IMaD will also work with PNLP, INRSP and ATN Plus to plan an integrated outreach training workshop and outreach program.

## **PROGRAM OVERVIEW BENIN**

### **I. Description of program objectives, accomplishments and activities.**

#### ***Program Objectives:***

Overall Program Objectives:

1. Conduct a rapid assessment of laboratory capacity to determine availability of equipment and trained personnel for microscopy and RDTs, giving attention to quality and effectiveness.
2. Train laboratory technicians in malaria diagnostics at the commune and health zone levels.
3. Assess and improve the National Laboratory for Quality Control's system for microscopy and RDTs in all facilities, to include monitoring and evaluation of diagnostic proficiency and utilization by clinicians.

#### ***Accomplishments***

- Hired Mr. Abdou Saliou as the IMaD/Benin in-country coordinator to provide technical assistance to the MOH/PNLP to implement the IMaD project.
- Conducted harmonization meeting to share generic IMaD materials with the MOH/PNLP, PISAF, and World Bank Booster Program to tailor them for their use in Benin. These documents include:
  - National Guidelines on Laboratory Diagnosis of Malaria
  - Malaria-specific and integrated training materials
  - Clinical and laboratory Outreach Training support material
  - Clinical and laboratory outreach checklists.
- The IMaD curricula for clinicians and laboratory technicians have been discussed and reviewed with representatives from IMaD, the PNLP, and the National Service of Public Health Laboratories (SNLSP).

- A partnership has been established between IMaD, MOH/PNLP (also representing World Bank) and Projet intégré d'Appui à la Santé Familiale (PISAF) for the training course of clinical and laboratory supervisors. Laboratory outreach training and support supervisory checklists have been shared with PISAF and harmonization of supervisory materials is being discussed.
- An integrated approach of outreach supervision has been agreed upon between IMaD and PISAF, which will follow the National Strategy of Supervision. IMaD will focus on laboratory supervision and collaborate with PISAF's existing clinical supervision program. Initial outreach visits will take place in 36 health facilities in 6 Departments.
- Twelve laboratory technicians from the same health facilities as PISAF's clinical supervisors have been identified to participate in the supervision training course. Additionally, IMaD and PISAF have agreed that twelve clinicians, trained by PISAF in 2008, will participate in the training course for 2.5 days.
- IMaD has completed planning of the outreach training course including:
  - The venue of Bohicon with a practical session occurring at the Department Hospital Centre of Zou/Collinee
  - The training will occur during 1 – 6 June 2009
  - 12 laboratory and 12 clinical participants have been identified
  - Facilitators have been identified
  - Microscopes for the training have been secured
  - The health facilities to be visited in the first round of outreach supervision have been identified.
- The IMaD outreach program will begin immediately following the completion of the outreach training course. The implementation of the supervisory visits will be ensured and facilitated by the in-country coordinator. Each supervisory team (1 clinician and 1 laboratory technician) will make a work plan including time frames, budgets and required logistics before the end of the training course. The work plans will be discussed by the group during the Outreach training course.

### ***Activities***

#### **Visit 1: Training and Outreach Coordination Visit February 2009**

A training and outreach coordination visit was performed by Dr. Daouda Ndiaye between 16 – 21 February, 2009. Coordination and logistical planning meetings with staff from the Mission, the PNLP, PISAF, Centrale d'Achats des Médicaments Essentiels et Consommables Médicaux du Bénin (CAME) and SNLSP were carried out. The logistics and planning for the IMaD training of laboratory and clinical supervisors and the outreach supervisory program were initiated. In addition, candidates to serve as in-country IMaD coordinator were identified and interviewed.

Logistical support has been provided by the Medical Care Development International (MCDI) field office in Parakou.

### IMaD/Benin In-Country Coordinator for Benin

A scope of work and job description was developed by the IMaD team and PMI–Benin prior to the February 2009 training and outreach coordination visit. During this visit Dr. Daouda Ndiaye interviewed candidates for this position and identified Mr. Abdou Saliou as the top candidate. Mr. Saliou is a laboratory parasitologist with 14 years of laboratory experience. Additionally he conducted supervision in collaboration with PNLP during 2003.

Mr. Saliou began employment as the IMaD/Benin In-Country Coordinator on 18 May 2009. The main role of the IMaD/Benin in-country coordinator is to facilitate timely implementation of IMaD Benin’s annual work plan. To this end, the Coordinator will liaise with and maintain productive collaborative relationships with in-country partners, namely: (1) the PMI/Benin team; (2) the PNLP, (3) other PMI/Benin implementing partners, especially those working in supervision (PISAF) and (4) other stakeholders in malaria diagnostics, such as professional associations, private sector representatives and the WHO country office. The IMaD/Benin In-Country Coordinator will support and follow up on assignments carried out by IMaD’s partners. Their duties will include providing assistance with coordination, logistics and communication including the organization of training, workshops and other events, and data collection for monitoring and evaluation including the numbers of supervisory visits made, people trained, reports disseminated and other products. In addition, the IMaD/Benin In-Country Coordinator will work with the IMaD regional and headquarters staff to plan for and ensure successful execution of IMaD technical assistance, including TDY visits and virtual support during a minimum of bi-weekly teleconferences and through regular activity reports.

## **II. Program challenges and solutions**

Based on the MOPs and field experience to date, the team believes the following areas could potentially create a challenge to our established goals:

- Complexity of working without in country presence

The hiring of an IMaD/Benin In-Country Coordinator has been finalized. The in-country coordinator will be responsible for managing in-country budgets, finances and logistics.

- Communication difficulties between IMaD and in-country partners.

Strengthen partnership between PISAF and IMaD to facilitate good coordination by establishing a bi-weekly conference call with PISAF, and also a monthly teleconference with the PNLP, PISAF, the Mission, and IMaD.

### **III. Outline of Way Forward:**

Tasks to be fulfilled by IMaD and collaborative partners by the end of the FY09 (September 2009):

Training materials (curriculum, PowerPoint presentations and time table) for laboratory technicians and joint sessions for clinicians will be finalized and printed by the end of May 2009. A training course for supervisors will be conducted and 24 participants (12 laboratory technicians and 12 clinicians) will be trained for supervisory visits (June 1 - 6). The outreach supervision program will begin immediately following the completion of this course. 36 health facilities (31 Zonal Hospitals from 6 departments plus 5 Departmental Hospitals) will be visited and supervised during the first round of supervision (tentative dates: June/July 2009).

A draft version of the National Guidelines on Laboratory Diagnosis of Malaria will be developed from the WANMAT guidelines in collaboration with the MoH, the PNLP and other partners, after the 1st round of the supervisory visits. The first report and information obtained from the checklists after the first round of supervisory visits will allow for a general overview on strengths and weaknesses.

As training materials specific to laboratory staff do not exist, the PNLP is interested in using the IMaD laboratory training materials. PNLP will review and adapt the materials after concurrence with local partners. The revisions of the IMaD Laboratory training material will be discussed during the training mission in June 2009. An agreement on a time frame for the 2<sup>nd</sup> round of supervisory visits (60 HFs; 36 from 1<sup>st</sup> round and 24 additional facilities) will be made with partners (PISAF, PNLP, Mission, In-country coordinator) during the training. In addition, a provisory date will be scheduled with partners for the workshop after the 2<sup>nd</sup> round of supervisory visits.

## **PROGRAM OVERVIEW KENYA**

### **I. Description of program objectives, accomplishments and activities.**

#### ***Program Objectives:***

1. Perform a national laboratory needs assessment to more accurately define gaps and define resource allocation for human resources, training, equipment and supplies.

#### ***Accomplishments:***

- A nationwide laboratory needs assessment of 1192 health facilities was carried out.
- Preliminary laboratory assessment data from 56 facilities will be shared during the poster presentations at the MIM conference in Nairobi.

## **II. Program challenges and solutions**

Based on the MOPs and field experience to date, the team believes the following areas could potentially create a challenge to our established goals:

- Shortage of laboratory technologists and supplies

The country's shortage of laboratory staff may be eased by the absorption of qualified personnel into government employment through donor support.

- Poor laboratory infrastructure

The nationwide needs assessment has identified major gaps in laboratory infrastructure. Understanding the needs of each facility can aid the Government of Kenya to plan interventions and help access donor support.

- Poor QA/QC system

This issue can be addressed by the development of QA/QC systems at the national reference laboratory level. This must be carried out in conjunction with the MOH, driven by the malaria Technical Working Group.

- Limited financial support for Outreach Supervisor logistics and field work

Limited financial support for site supervision and follow up on-site training is a major program constraint. Without strong follow-up support, program sustainability becomes problematic. IMaD will work with in-country partners to advocate for more funds for site supervision activities.

## **III. Outline of Way Forward:**

The nationwide laboratory assessment was conducted on a census basis. Given the large numbers of facilities assessed, IMaD will ensure quality by conducting an external review of the findings from a statistically significant sample.

Based on the gap analysis report from the nationwide assessment, IMaD will identify those facilities most in need of new microscopes. In addition, IMaD will work in conjunction with the MOH and in-country partners to fill other gaps identified from the laboratory assessment.

Information garnered from the needs assessment will be used to advocate for the creation of malaria reference laboratory services at DOMC to quality assure malaria program commodities.

Finally, technical assistance will be provided in the form of design, piloting and establishment of an integrated QA/QC system for malaria laboratory diagnosis in Kenya. The Kenya malaria TWG will develop a protocol for slide rechecking to be used during supervisory visits with central laboratory confirmation. This protocol will be integrated with QA/QC systems currently operated by other national disease control programs.

## **PROGRAM OVERVIEW ETHIOPIA**

### **I. Description of program objectives, accomplishments and activities.**

#### ***Program Objectives:***

1. Support an in-depth laboratory baseline needs assessment in selected health facilities in Oromia using a standardized, pre-tested assessment tool;
2. Assist in review and support the modification or development of malaria (laboratory) diagnosis policy guidelines, focusing on the use of RDTs;
3. Assist in the revision, modification and/or development of malaria (laboratory) diagnosis training materials;
4. Provide technical assistance in the design, piloting and establishment of a QA/QC system for malaria laboratory diagnosis in Oromia that is integrated within the current structure of EHNRI and its satellite regional reference laboratories and dovetails into ongoing diagnostic QA/QC activities in the fields of HIV/AIDS and tuberculosis.

#### ***Accomplishments:***

- IMaD has begun a consultative period on the development of policy documents for malaria diagnosis. The consultative period began with the sharing of IMaD generic policy and training documents with EHNRI officers and other malaria program stakeholders;
- Completion of a pilot laboratory assessment exercise in Oromia;
- Finalization of assessment tools for health posts and health facilities following a pilot exercise in four health facilities in Oromia region.

#### ***Activities***

##### **Visit 1: October 2008**

A preliminary meeting was held with USAID Ethiopia and AMREF Ethiopia in Addis Ababa to review current activities and discuss IMaD's Scope of Work. During the meetings the International Center for Health Care and Treatment Programs (ICAP) at Columbia University was identified as IMaD's in-country partner. ICAP supports HIV care and treatment at a number of hospitals and health centers in Oromia Regional State. IMaD will be working with the regional reference laboratories and the Ethiopian Health Nutrition and Research Institute (EHNRI) to implement malaria laboratory diagnostic activities.

##### **Visit 2: December 2008**

Three representatives from the IMaD team visited Addis Ababa to attend a two day Micro-Planning Workshop on the current status of laboratory diagnostic activities in Ethiopia. The meeting objectives were:

- To discuss the current situation, experiences and gaps in Malaria Laboratory Diagnosis & Monitoring in Ethiopia;
- To recommend priority steps and the ways forward;
- To discuss the coordination mechanism for supporting capacity-building activities.

During the visit, a modified version of the IMaD Assessment Tool was piloted at four health facilities in the East Shoa Zone of Oromia Region. Three members of the IMaD team accompanied two members of the ICAP team during the piloting exercise. Formal assessments were carried out at one health post, one regional laboratory, one malaria center, and one health center resulting in the representation of every laboratory level in the health care system. At the health post, both laboratory and clinical information was collected. The laboratory assessment captured information on the following key areas: essential facilities, laboratory services, staff, equipment/repair, supplies, workload, supervision and training, quality assurance, and safety. The clinical assessment captured information on the following areas: essential facilities, referral facilities, cost to patient, clinical services, staff, equipment, reference materials, and supervision and training.

Following the visits, the team revised the assessment tools in preparation for the comprehensive baseline assessment of health facilities in Oromia Region.

## **II. Program challenges and solutions**

Based on the MOPs and field experience to date, the team believes the following areas could potentially create a challenge to our established goals:

- Number and complexity of partner relationships has resulted in slow progress of program activities.

Work with the in-country partner and AMREF in Ethiopia to support stakeholder meetings and completion of the work as soon as possible. The MLDM Technical Team needs to be committed to completing the work on schedule.

## **III. Outline of Way Forward**

At the end of the consultative period, IMaD will complete the following training documents developed by the Malaria Laboratory Diagnosis & Monitoring (MLDM) Technical Team:

- Malaria Laboratory Diagnosis EQA Implementation Manual
- Malaria Laboratory Diagnosis Training – Participants’ Manual
- SOPs for Malaria Light Microscopy
- Malaria Microscopy Training – Participants’ Manual
- Malaria RDT Training – Participants’ Manual

The report of the laboratory assessment in Oromia region report is currently being finalized and once complete, IMaD will review and analyze the data collected. The data gathered will provide information on manpower, infrastructure, equipment, quality assurance and other issues to guide national procurement of essential equipment supplies and plan staff deployment and training needs.

IMaD will assist in the development of malaria laboratory diagnostic policy guidelines, with a focus on RDTs. This document will be developed by the MLDM Technical Team and reviewed by all stakeholders.

IMaD will assist in the design, piloting and establishment of an integrated QA/QC system for malaria laboratory diagnosis in Oromia Region. The MLDM technical team will develop a protocol for slide rechecking to be used during supervisory visits with central laboratory confirmation. This protocol will be integrated with QA/QC systems currently operated by other national disease control programs. IMaD has provided a draft slide rechecking protocol that will be reviewed at the stakeholders' workshop. Following agreement of the draft protocol, the system will be introduced at selected pilot sites for evaluation and monitoring.

## **PROGRAM OVERVIEW MALAWI**

### **I. Description of program objectives, accomplishments and activities.**

#### ***Program Objectives:***

1. Conduct a comprehensive assessment of malaria diagnostic capabilities, and based on the assessment propose a work plan for the remaining FY09 and FY10;
2. Carry out a performance evaluation of malaria microscopy at 14 sites.

#### ***Accomplishments:***

- Assessment of malaria diagnostic capabilities in 14 facilities.
- Performance evaluation of malaria microscopists in 14 facilities.
- Development of a preliminary work plan.

#### ***Activities***

##### **Visit 1: March 2009**

Dr Luis Benavente and Mr. Yamo Ouma conducted a baseline assessment of laboratories during 8 – 21 March 2009. In addition, the IMaD team attended the annual planning meeting of the NMCP and gathered input from coordinators on how to attain IMaD objectives in the various districts.

## **II. Program challenges and solutions**

Based on the MOPs and field experience to date, the team believes the following areas could potentially create a challenge to our established goals:

- Number and complexity of partner relationships has resulted in slow progress of program activities.

Program efficacy could be greatly improved by the hiring of an MaD/Malawi in-country coordinator.

- Lack of staff and financial resources for outreach supervision at the NMCP.

Implementation of outreach supervision is expected to have logistical and financial constraints due to the fact that public health facilities are extremely busy, mainly because services are free. This will require simplifying supervisory tools to allow data to be collected in short time. Fuel is extremely expensive; it is proposed that NMCP and other vertical programs conduct integrated supervisions to health facilities sharing the cost of fuel (already being done)

## **III. Outline of Way Forward**

Given that DELIVER has been tasked with detailed assessments of diagnostic capabilities (as part of HIV/AIDS initiatives), IMaD will continue to share findings and recommendations. This includes sharing with DELIVER the protocol IMaD originally developed for Madagascar, to assess the utilization of RDT results in making therapeutic decisions. Ongoing RDT assessments have highlighted quality issues that must be addressed through training and supervision. During 2009, IMaD will support the NMCP to provide training in malaria microscopy and RDT. IMaD will assist the NMCP to develop a plan for implementing biannual supervisory visits.

### **External Competency Assessment of Malaria Microscopists**

The lack of standards of competency in malaria microscopy and a reliable method for measuring performance poses one of the primary obstacles to reliable malaria diagnosis. IMaD has assisted the international community, via the World Health Organization (WHO), by participating in several WHO sponsored malaria microscopy expert panels to establish internationally recognized standards to assess the proficiency of malaria microscopists (2,3,).

Despite advances in antigen detection and gene sequence amplification technology, microscopic examination of stained blood films is still the accepted standard for malaria diagnosis. Even early malariologists like Ronald Ross emphasized the importance of externally validating results and training microscopists [4]. Decades later, during the height of the global malaria eradication campaign of the 1950s and 1960s, experts recognized that “as malaria begins to disappear from each country, case finding and parasite identification become

essential in locating residual foci of transmission, the halting of which achieves eradication. In searching this out, the microscopist plays a key role” [5]. This becomes increasingly relevant as malaria reemerges in areas where malaria was previously controlled, like Java [6] or the highlands of Kenya [7]. As multi-drug resistant *P. falciparum* malaria continues to emerge and new regimens are developed for differential treatment of *P. falciparum* and other species, accurate species detection becomes critical [8] and the importance of competency in microscopic diagnosis assumes substantial new importance.

The quality of microscopy in Africa is highly variable and methods for validating proficiency are not standardized. Currently described methods for slide preparation [5, 9, 10] yield well known variations in film readability as well as parasite quantification. Reporting of results varies between institutions and depends on the skills of the microscopist, workload, quality of equipment and setting, i.e. research versus clinical case management [11]. The current broad lack of standardized approaches to proficiency testing, especially those lacking external validity, contributes to the risk of diagnostic error [12].

The emergence of the new malaria control paradigm, focusing on treatment as well as prevention [13], demands resolve to ensure minimum standards of competency at the periphery of microscopic diagnostic services. As the world shifts from a focus on malaria parasite detection to fever diagnosis, which encompasses other fever-causing pathogens, the role of expert microscopy cannot be overemphasized.

## **Human Resource Capacity**

During the first fiscal year of program activities, MCDI received a request from the USAID CTO to significantly scale up core program staff in order to meet the demands of the IMaD program. This task was seen as crucial for IMaD to move from the planning and assessment stage into program implementation. Therefore, during 2008, IMaD made improvements to core human resource capabilities. IMaD brought in a multi-lingual consultant (Dr. Daouda Ndiaye) who has contributed greatly to programs in Mali and Benin. Furthermore, IMaD management was boosted by doubling the effort of the Senior Manager, Dr. Roy Prescott.

Despite efforts to increase the level of effort of key staff, IMaD realizes that core support remains a limitation to program implementation. The initial RFA requested 2-3 key staff. However, greater capacity is required to support a program spanning more than ten countries. During the remainder of this fiscal year, IMaD would ideally hire additional support staff to address program administrative needs.

**IMAD CORE & COUNTRY-SPECIFIC PROJECT Cummulative Expenses**

Below, are **approximate** cummulative expenses under IMaD thru March 2009.

**Note that expenses for two of the subcontractors are not included for the period January-March 2009 as expense reports have not yet been received yet; therefore, final expenses for this period will eventually be higher.**

It is anticipated that expenses will increase **substantially** in the next two quarters for training and outreach activities.

		Countries										
	CORE	1 Ghana	2 Liberia	3 Madagascar	4 Benin	5 Angola	6 Mali	7 Zambia	8 Kenya *	9 Ethiopia	10 Malawi	TOTAL
ACCT. CODE	76252	85012	85022	85032	85042	85052	85062	85072	85082	85092	85102	
<b>Obligated Amount</b>	\$ 1,600,000	\$ 510,000	\$ 362,500	\$ 402,000	\$ 200,000	\$ 350,000	\$ 585,000	\$ 300,000	\$ 87,500	\$ 75,000	\$ 20,000	\$ 4,492,000
<b>Expenses through March 2009</b>	\$ 957,273	\$ 126,083	\$ 41,081	\$ 41,402	\$ 72,452	\$ 69,000	\$ 91,419	\$ 28,047	\$ 92,828	\$ 16,620	\$ 16,310	\$ 1,552,515

\* Kenya - Expense amount included \$ 87,500 advance to AMREF for implementation; this has not yet been expensed; therefore, costs could potentially be lower (anticipated). Expenses over the obligated amount will be covered by the Core budget.

## Bibliography

1. World Health Organization. (2008). *Malaria Rapid Diagnostic Test Performance results: WHO product testing of malaria RDTs: Round 1 (2008)*. (Publication No. TDR.09.978-924-1597852). Special Programme for Research & Training in Tropical Diseases (TDR), Geneva.
2. Malaria Microscopy –Creating a Culture of Quality, World Health Organization, 2005
3. Malaria Microscopy Quality Assurance Manual, Version 1, World Health Organization, 2008
4. Ross R: An improved method for the microscopical diagnosis of intermittent fever. *Lancet* 1903, 164: 86.
5. Wilcox A: *Manual for the Microscopical Diagnosis of Malaria in Man*. U.S. Department of Health, Education, and Welfare, Public Health Service: United States Government Printing Office; 1960.
6. Barcus MJ, Laihad F, Sururi M, Sismadi P, Marwoto H, Bangs MJ, Baird JK: Epidemic malaria in the Menoreh hills of Central Java. *Am J Trop Med Hyg* 2002, 66: 287-92.
7. Shanks GD, Biomndo K, Hay SI, Snow RW: Changing patterns of clinical malaria since 1965 among a tea estate population located in the Kenyan highlands. *Trans R Soc Trop Med Hyg* 2000, 94: 253-5.
8. Barnish G, Bates I, Iboro J: Newer drug combinations for malaria may be impractical unless diagnostic accuracy can be improved. *BMJ* 2004, 328: 1511-2.
9. Navy Environmental Health Center: *Navy Medical Department Pocket Guide to Malaria Prevention and Control*. Technical Manual NEHC-TM6250.98.2: Bureau of Medicine and Surgery; 1998.
10. WHO, *Basic Malaria Microscopy, Part I & II*. Geneva: World Health Organization; 1991.
11. Durrheim DN, Becker PJ, Billingham K, Brink A: Diagnostic disagreement – the lessons learnt from malaria diagnosis in Mpumalanga. *South Afr Med J* 1997, 87(5): 609-11.
12. Ohrt C, Purnomo, Sutamihardja MA, Tang D, Kain K: Impact of microscopy error on estimates of protective efficacy in malaria-prevention trials. *J Infect Dis* 2002, 186: 540-6.
13. Baird JK: Resurgent malaria at the millennium: control strategies in crisis. *Drugs* 2000, 59: 719-743.