



MALARIA LABORATORY DIAGNOSIS AND MONITORING PROJECT

Nine Years of Action for Improving Quality of Malaria Laboratory Diagnosis and Case Management Services in Ethiopia

Accurate early diagnosis and prompt treatment of malaria is one of the core strategies employed to prevent and control malaria in Ethiopia. The Federal Ministry of Health (FMoH) recommends employing quality assured microscopic diagnosis of suspected malaria patients at health centers and hospitals.

The FMoH's objective is to ensure universal access for malaria diagnosis and treatment within 24 hours of the onset of fever. The mix of parasite species, *P. falciparum* and *P. vivax* that require distinctive treatment regimens and the unstable nature of malaria transmission is a unique feature of malaria in Ethiopia, demanding a special emphasis for improved diagnostics in the context of malaria patients' case-management.



Since 2008, Ethiopia has received support from the President's Malaria Initiative (PMI) through USAID. Among the many key national priorities that PMI supports, the Malaria Laboratory Diagnosis and Monitoring (MLDM) project has been implemented over the last nine years through ICAP at Columbia University, primarily focusing on five regional states – including Oromia, Amhara, Tigray, Southern Nations, Nationalities and Peoples regions – and Dire Dawa City Administration, with minor support to emerging regions.

KEY ACHIEVEMENTS

With the funds obtained from PMI/USAID, ICAP, in partnership with FMOH, Ethiopian Public Health Institute (EPHI), Regional Health Bureaus (RHBs) and Regional Reference Laboratories (RRLs), has achieved key milestones in malaria laboratory diagnosis and quality assurance activities.

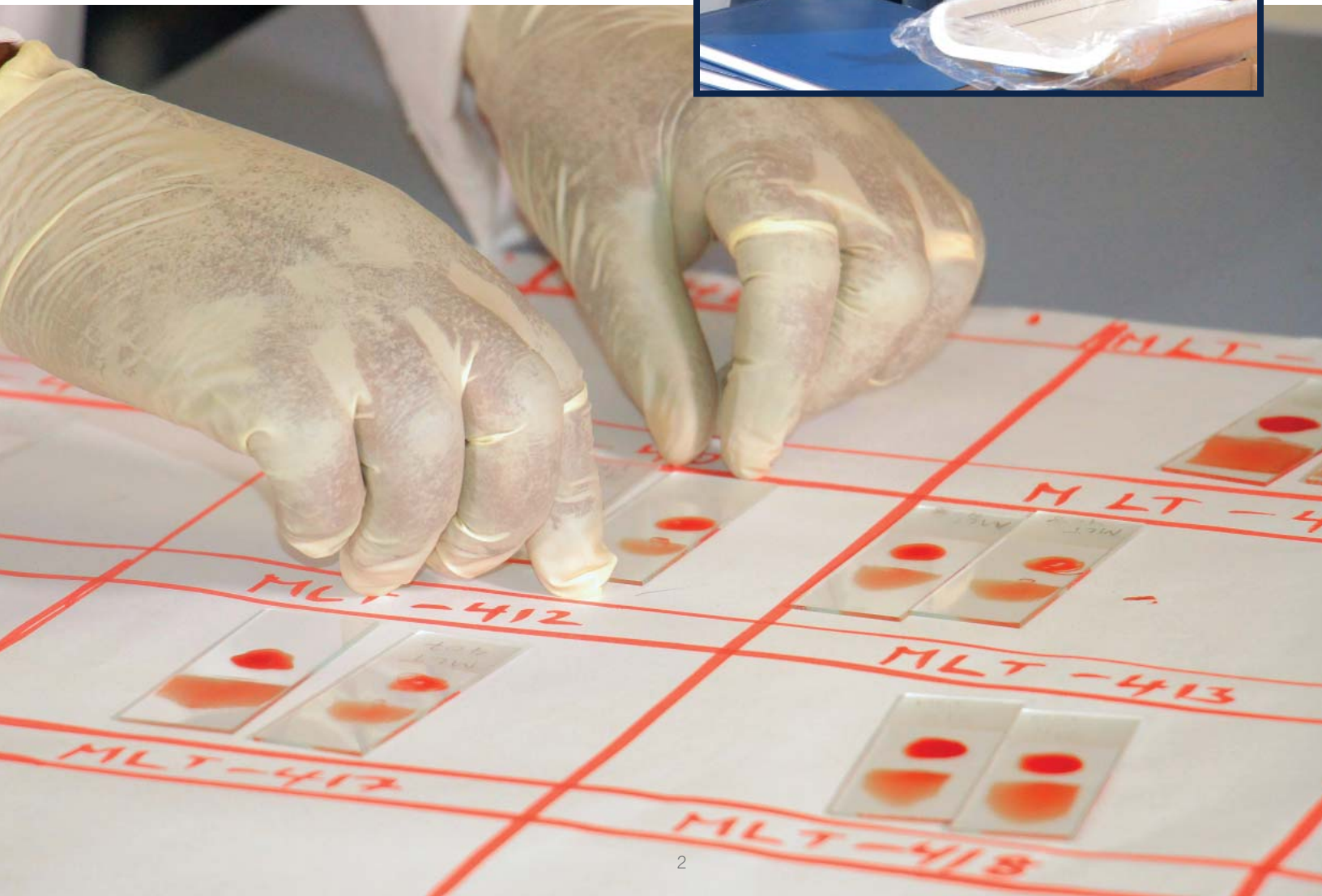
CORE COMPONENTS OF MLDM PROJECT

Improving Quality of Malaria Laboratory Diagnosis (Microscopy & RDT)

Improving Malaria/Fever Case Management

Strengthening linkage between Malaria & HIV Diagnostic and Treatment Services

Conduct Operational Researches



Strengthening the partnerships and coordination of the national malaria laboratory diagnosis and monitoring activities involving all important malaria stakeholders in Ethiopia.

ICAP has:

Supported the development and revision of national malaria guidelines, national malaria strategic plans, malaria elimination related guidelines and manuals and related documents;

Supported the development and distribution of Malaria Laboratory Diagnosis External Quality Assurance Scheme guidelines;

Supported the development and distribution of the Manual for Laboratory Diagnosis of Malaria

Supported the development of malaria laboratory diagnosis and quality assurance training materials;

Supported the development of malaria case management training manuals;

Produced and handed over 3,200 malaria and Borellia spp positive slides to be used by universities, health science colleges, national and regional reference laboratories to help standardize malaria microscopy pre-service and in-service trainings across the country;

Developed an Excel-based grading tool to assist evaluations during the practical examinations and provide feedback on both pre-test and post-test during the training sessions;

Supported the establishment of the nation's first National Malaria Slide Bank, a key source of standardized blood film slides for malaria laboratory external quality assurance (EQA) program, national and international malaria microscopy trainings and competency assessments.



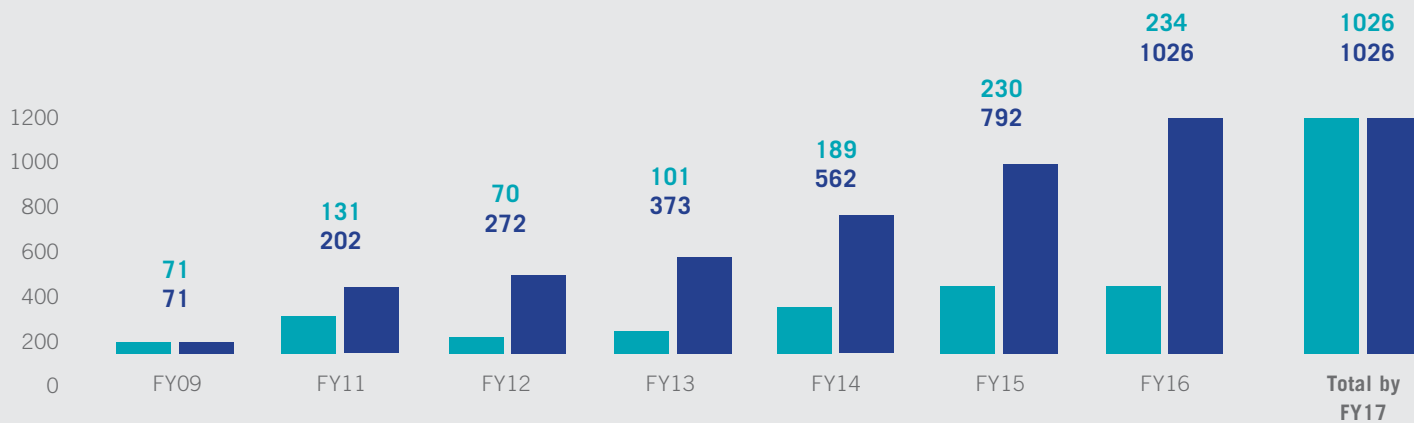
Supporting the scale-up and strengthening of quality assurance (QA) activities and laboratory systems related to malaria laboratory diagnosis in collaboration with Regional Reference Laboratories and EPHI.

Introduced and scaled up malaria quality assurance program in 1,026 health institutions;

Provided malaria laboratory supplies to all PMI supported health facilities coupled with capacity building training and mentorship program.



MLDM Project Health Facility Support Scale up



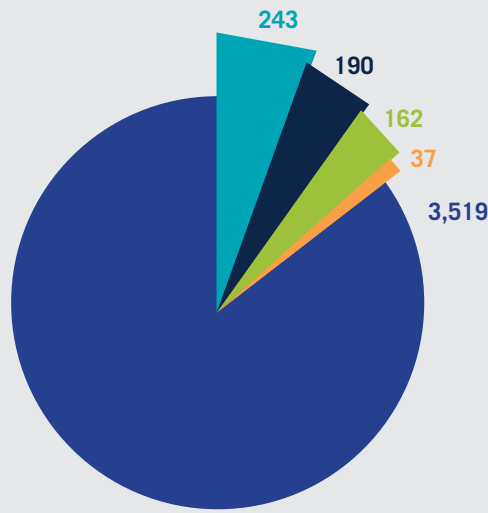
“There was a huge gap in malaria diagnosis service across the country and reaching all the facilities was beyond our capacity. ICAP provided training for laboratory personnel; provided equipment and supplies and supported the initiation and scale up of the laboratory quality assurance program in our region.”

Embabo Dede, Former Director of Nekemte Regional Laboratory

Training of malaria program managers, clinical and laboratory health professionals in malaria laboratory diagnosis and laboratory QA/QC systems.

Capacity Building Training on Malaria Diagnosis and Quality Assurance

- Number of national & regional laboratory personnel received WHO External Competency Assessment of Malaria Microscopists
- Number of laboratory professionals trained on Malaria/HIV laboratory diagnosis and QA
- Number of graduating students received basic malaria microscopy and QA/QC training



- Number of college & university instructors received TOT on malaria diagnosis and quality assurance
- Number of national & regional laboratory personnel received TOT on malaria diagnosis and quality assurance

“Before 2010, there was no known malaria lab diagnosis EQA program in Ethiopia. Laboratories simply reported test results with no external oversight. Now, EQA coverage has increased from nothing, now benefiting about 700 facilities in our region”

Feleke Belachew, Director, Oromia Public Health Research Capacity Building and Quality Assurance Laboratory Center



Conduct operation research projects

Operational researches are powerful tools for generating information for decision-making. Close monitoring of therapeutic efficacy of antimalarial drugs is vital in the era of drug resistance and decreased transmission.

ICAP, in collaboration with the Federal Ministry of Health (FMOH), Ethiopian Public Health Institute (EPHI) and Regional Health Bureaus (RHBs), has conducted several operational researches and substantially contributed to evidence-based information gathering for policy decision making in support of malaria control, prevention and elimination activities.

Published and unpublished research works:

In Vivo Efficacy of Artemether-Lumefantrine and Chloroquine against *Plasmodium vivax*: A Randomized Open Label Trial in Central Ethiopia. PLoS ONE 8(5): e63433

In vivo efficacy of artemether-lumefantrine against uncomplicated *Plasmodium falciparum* malaria in Central Ethiopia. Malaria J 10: 2009

Malaria Diagnostic Capacity: Baseline Assessment of Health Facilities in Ethiopia. Malaria Journal, 13:292

Laboratory malaria diagnostic capacity in health facilities in five administrative zones of Oromia Regional State, Ethiopia. Trop Med Int Health. 15: 1449–1457

Comparison of artemether-lumefantrine and chloroquine with and without primaquine for the treatment of *Plasmodium vivax* infection in Ethiopia: A randomized controlled trial. PLoS Med 14(5): e1002299

Burden of malaria among adult patients attending general medical outpatient department and HIV care and treatment clinics in Oromia, Ethiopia: a comparative cross sectional study. Alemayehu et al. Malar J (2015) 14:501

Evaluating the adherence with artemetr-lumefantrine for the treatment of uncomplicated *Plasmodium falciparum* infection (Unpublished)

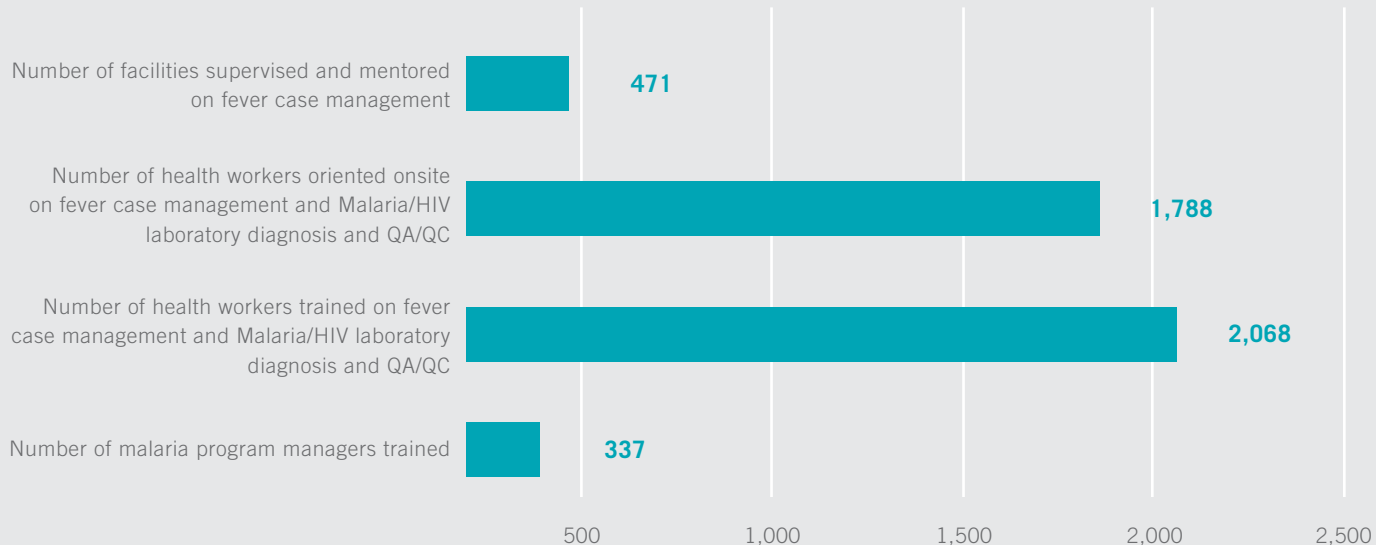
Therapeutic efficacy study of artemether-lumefantrine or dihydroartemisinin-piperaquine for the treatment of uncomplicated *Plasmodium falciparum* and dihydroartemisinin-piperaquine or chloroquine for the treatment uncomplicated *Plasmodium vivax* infection. (on going)

EPHI supports the national malaria elimination program with undertaking various operational researches. We conduct malaria drug efficacy studies and evaluate the effectiveness and efficiency of malaria diagnostic tools. In this endeavors, we closely work with PMI/USAID and ICAP.

Sindew Mekasha
Malaria and NTDs Research Team Leader, EPHI

Improving fever/malaria case management at PMI project sites and in Ethiopia

Malaria Case Management Support



Strengthening the linkages between malaria and HIV and TB diagnostic and treatment services at health centers and hospitals in Ethiopia.

Health facilities have received technical support to improve the general laboratory activities and with particular focus on HIV and TB testing and EQA program



The way forward

The implementation of malaria laboratory diagnosis and monitoring activities was key to improving the quality of malaria laboratory diagnosis and patient management in the country in general and supported health care facilities in particular.

Development of guidelines and standardized training materials, provision of standardized training coupled with external quality assessment, site supportive supervision and mentorship were the combined key interventions implemented for the improved quality of malaria laboratory diagnosis and case management in Ethiopia. These need to be strengthened in the years to come. Capacity building activities in higher educations should be emphasized as part of strengthening the pre-service education, tackling the problem with malaria laboratory diagnosis and case management at the grassroots level and sustaining the successes already attained.

Malaria laboratory diagnosis and monitoring activities should be scaled up to all malaria low- and high-prevalence areas where active case finding and follow-up are key in the era of the malaria pre-elimination and elimination efforts that the country is envisaging in the years to come.



“Through PMI’s support, the laboratory diagnosis has created an excellent Connection with the case management. In order to make malaria treatment effective, ICAP focused not only on laboratory experts, it also capacitated the OPD staffs in fever case management and malaria treatment areas.”

Mulat Melese
Vice Director, Amhara Public Health Institute