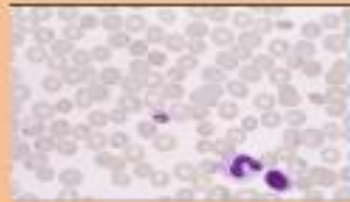


**Malaria Laboratory Diagnosis and Quality Assurance
Training
Participants' manual**

1st Edition

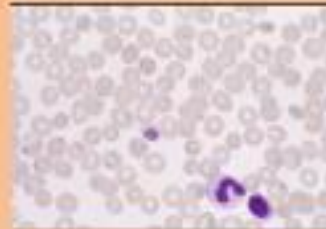
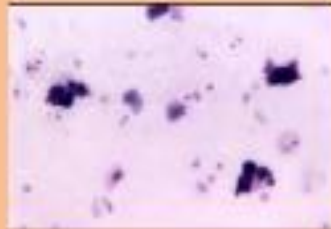


**Ethiopian Public Health Institute
Federal Ministry of Health
February, 2022**



**Malaria Laboratory Diagnosis and Quality Assurance
Training for Laboratory Professionals in Ethiopia
A Guide for Trainers**

1st Edition



Ethiopian Public Health Institute
Federal Ministry of Health
February, 2022



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Course Description

This course is intended for use in particular by health professionals and stakeholders working on malaria laboratory diagnosis program, and in general for multidisciplinary teams involved in managing national malaria control program, academic instructors, Laboratory personnel, program supervisors and trainers. This course provides basic information and practical skills for the successful operation of malaria laboratory diagnosis in the area of overview of malaria, laboratory procedures, laboratory safety, quality assurance, supply management, and outlines the skill needed for laboratory diagnosis of malaria. This course will take 40 hours (five days) to cover all contents of the course.

Course Goal

The goal of this training is to improve the competency of laboratory professionals on malaria laboratory diagnosis, and to enable them to provide accurate, reliable and timely results for customers.

Learning Objective

At the end of this training participant will enable to acquire essential knowledge and develop practical skills in MLDQA. Upon completion of the course, the participants are expected to; -

- Explain the biology of Malaria parasites and its epidemiology
- Apply safe handling and appropriate use of microscope
- Apply general safety practices in a laboratory environment
- Perform specimen collection, smear preparation, fixation and staining of blood film
- Detect, identify and quantify malaria parasites microscopically.
- Practice essential elements of result recording and reporting
- Apply general principles of supply management system
- Participate in the processes involved at national and regional malaria EQA schemes

- Implement laboratory ethics and good laboratory practices

Training Methods

- Interactive Lecture
- Group Discussions
- Self Reflection
- Think/Pair/share
- Practical Demonstration

Training Approaches

The MLDQA training package employs Adult Learning approaches.

- ❖ Knowledge sharing and acquisition based on the principles of adult learning.

Practical or skill based exercises. This approach is to enable participants to practically exercise the knowledge gained from didactic sessions.

Principles of Adult Learning

The following need kept in mind when working with adult trainees:

- a. Adults bring considerable experience with them; therefore, they wish to speak, participate and contribute to the training. Adults dislike long lectures and one-way communication.
- b. Most adults want courses that focus on real life problems and tasks to address them rather than spending time dwelling on academic issues.
- c. Adults learn with relevance. The training must connect clearly and directly with tasks faced by the trainee on the job.
- d. Adults learn best in comfortable settings. Therefore, physical discomfort will distract or create negative feelings.

- e. Adults want positive re-enforcement and feedback on errors as they occur.
- f. Adults are accustomed to being active. They should be given opportunities for active participation whenever possible.
- g. Adults need to maintain high self-esteem. Therefore, participants need to maintain high self-esteem to deal with the demands of a training course.
- h. Adults learn with humor. A little lightness, amusement and fun can keep the training from being boring.

Training Materials

Sample collection
and blood film
preparation

Fixation and
staining

Examination and
reporting

Others

- Absorbent cotton
- 70% Alcohol
- Sterile blood lancet
- Tourniquet
- Sterile syringe with needle/Vacutainer needle with needle holder
- EDTA test tube
- Fresh whole blood (for practical blood film preparation)
- Disposable glove
- Pencil for labeling
- Pencil sharpener
- Microscope slide
- Absolute Methanol
- Giemsa stock solution
- Buffer Tablet
- Distilled Water
- Drying rack
- Timer
- Staining jar/rack
- Reporting and Evaluation forms
- Immersion Oil
- Tally counter
- Known positive and negative malaria slides (for demonstration and evaluation)
- Divider
- Tissue paper
- Slide box
- Lense paper
- Lense cleaning solution
- Binocular Microscope
- Participant manual,
- Facilitator guideline
- Reference Materials
- Pen
- Note book
- Different format
- Binder
- LCD
- Laptop computers
- Marker
- Flip chart
- 10% bleach
- Soap for hand wash
- Job aid
- Lab Coat
- Safety box
- Biohazard bag

Target Audience

This manual is intended for use in particular by health professionals and stakeholders working on malaria laboratory diagnosis program, national malaria control program, academic instructors, program supervisors and trainers. This manual will be a useful resource in the country to implement effective malaria laboratory diagnosis.

Participant Selection Criteria

The participant who will fulfill at least one of the following criteria will be a potential candidate for training on MLDQA:

- Laboratory professionals providing laboratory testing services at any health facility
- Laboratory professionals /academicians who are involved in teaching laboratory students at higher learning institutions
- Newly hired laboratory professionals who have never had the opportunity to go through this training
- Laboratory professionals who have at some point attended the course but need refresher training

Number of Participants

It is suggested that 25 – 30 participants per training session would allow optimal participation and a productive training.

Trainers Selection Criteria

Due to the interactive and practical nature of the training design, trainers are expected to have the following required experience and qualifications.

The trainers should fulfill all of the following specific criteria (except the optional):

- Content expert on malaria.
- Certified trainer of TOT for MLDQA.
- Competent in identifying different stages and species of plasmodium.
- Ability to commit the time required for whole course period.
- Familiar with delivering courses using skill based training approaches.
- Level 1 and Level 2 WHO Certified experts are preferred (Optional).

Number of trainers

A total of 5 trainers are required each day to effectively handle the theoretical didactic as well as practical sessions for this course. Availability of at least the two trainers to closely assist (co-trainer) the trainer (the person who will present the module) is highly recommended.

Methods of course evaluation

Course Evaluation

Evaluation of the training is achieved by collecting feedback from trainees at the end of each day of the training and at the end of the course. When trainers review feedbacks from trainees daily, they can often make immediate changes to improve the course. Daily evaluation and end of course evaluation forms are included in this manual.

Participants' evaluation

Formative

Pre-test questions both for knowledge and skill assessment are included in this guide to assess participants' current knowledge and experience, just before the training.

Evaluation of course participants is carried out in the following ways:

- Question and Answer
- Pre-test theoretical
- Pre training practical skill assessment of malaria microscopy based on
 - Parasite detection.
 - Species identification
 - Parasite density estimation

Summative

Evaluation of course participants at the end of the training is carried out in the following ways:

- Post-test theoretical: accounts 50%
- Cumulative practical skill assessment of malaria microscopy (Post exam): accounts 50%
 - Parasite detection.
 - Species identification
 - Parasite density estimation

Certification criteria

- 100% attendance and
- Average Post- theoretical and practical test point $\geq 80\%$

Course Duration

Five Days (40 hours) are needed to cover all contents of the course.

Venue selection and organization

Venue selection

Appropriate venue should be identified with the following specifications:

- Separate rooms for teaching and laboratory work
- Rooms well illuminated and ventilated
- Has clean and separate toilets for men and women
- Has adequate water supply and hand washing area.
- Free of disturbing noises
- Has mains electricity and/or provides access to a power generator with adequate socket outlets.
- Provides to internet and fax services

Ideally, one large room (with capacity for 30-35 participants) should be available for presentations and group discussions.

Venue arrangement

Training rooms should be arranged based on the availability of space and trainers' preference. Most trainers are familiar with the customary of "U"-shaped training set up where the tables are lined up with participants facing each other and the trainer(s).

For the practical work, **at least one** large room with three separate workstations is needed:

- Microscopy work station (with at least 10 functional electric binocular microscopes)
- Smearing workstation
- Staining workstation

The workstations should be equipped with all necessary laboratory equipment and adequate supplies should be available for the smooth conduct of actual hands-on practical activities.