

Training in malaria microscopy and South Sudan's first malaria slide bank

Jacopo M. Rovarini (jacopo.rovarini@amref.it),
Songok Jackson, Jane Y. Carter, David Isaboke,
Stephen Munene, Andrea Bollini and Morrish
Ojok Amref Health Africa, South Sudan

Charles Mazinda, Laboratory Focal Person for
Malaria, National Malaria Control Programme,
South Sudan.

Wilson Sebit, Laboratory Manager, Parasitology
Laboratory, Public Health Laboratory, Juba,
South Sudan

Dear Editor,

Given that malaria in South Sudan is endemic in 95% of the country and contributes significantly to overall mortality (sixth cause of death),^[1] we feel that malaria deserves greater consideration by scholars, institutions, organizations and the public alike.^[2]

Several initiatives for tackling malaria are currently being implemented across the country by numerous health organisations. These include the improvement of malaria diagnosis based on clinical presentation and quality assured laboratory diagnosis using rapid diagnostic tests (RDT) and microscopy. Despite the practical advantages of adopting RDTs, microscopy remains the accepted standard for clinical diagnosis in resource-constrained settings.^[3,4] However, quality assured malaria microscopy requires basic laboratory infrastructure, a power source, well maintained equipment, a regular supply of quality reagents, and competent microscopists.

In February 2020, Amref Health Africa conducted two Refresher Training in Laboratory Diagnosis of Malaria courses in Juba at the Public Health Laboratory targeting microscopists from Ministry of Health hospitals and primary healthcare centres from greater Equatoria and Bahr el Ghazal regions of the country. When competence in malaria microscopy was assessed among the 24 microscopy trainees, none attained a competence level that would ensure an accurate malaria diagnosis. Instead, all the trainees achieved only the equivalent of Level 4 (the lowest grade) using the World Health Organization (WHO) grading system.^[5] A similar result was recorded in training courses in 2017.^[6] Microscopists with WHO Level 1 certification (the highest grade) achieve malaria parasite detection in at least 90% of samples, correctly identify malaria parasite species in $\geq 90\%$ of samples, and perform a correct parasite count in at least 50% of samples. Higher levels of competence in malaria microscopy are therefore urgently needed to improve malaria diagnostic services in South Sudan.^[7]

The current limited competence of malaria microscopists in South Sudan undermines the optimal performance of malaria diagnosis at health facilities. Amref Health Africa is therefore planning to conduct further refresher training and competence assessments in malaria microscopy, and, at the same time, establish South Sudan's first National Malaria Slide Bank. A malaria slide bank is a repository of well-characterized, high-quality reference malaria slides that are used for malaria training as well as in quality assurance programmes.^[8] The malaria slide bank will be established with the technical support of Amref Health Africa's Regional Laboratory Programme based in Kenya, which is in the process of setting up a regional malaria slide bank facility through the rigorous WHO process of slide validation and polymerase chain reaction (PCR) testing. The combination of standardised training activities with ongoing quality assurance and support supervision of microscopists has been shown to enhance accuracy of malaria diagnosis in clinical settings.^[9,10]

Thanks to a grant from the Italian Agency for Development Cooperation [AID 011817/03/5] and with the endorsement and collaboration of the Ministry of Health of the Republic of South Sudan, Amref Health

Africa in South Sudan has secured the necessary financial and institutional support to carry out these integrated interventions to improve the standard of malaria diagnosis in the country. We look forward to engaging a wider range of health partners to enable them to benefit from in-country, high quality malaria microscopy training and quality assurance services provided through the National Malaria Control Programme.

References

1. Institute for Health Metrics and Evaluation – University of Washington. South Sudan. Accessible at the following link: <http://www.healthdata.org/south-sudan>
2. UN OCHA – South Sudan, Humanitarian Needs Assessment 2020. UN OCHA; 2019.
3. Visser T, Daily J, Hotte N et al. Rapid diagnostic tests for malaria. Bulletin of the World Health Organization, Geneva; 2015. Accessible at the following link: www.who.int/bulletin/volumes/93/12/14-151167/en/
4. Berzosa P et al. Comparison of three diagnostic methods (microscopy, RDT, and PCR) for the detection of malaria parasites in representative samples from Equatorial Guinea. Malaria Journal 2018;17:333.
5. Amref Health Africa & MoHSS. Refresher Training Course in Laboratory Diagnosis of Malaria – Course Report. Juba; 10-21 February 2020.
6. Amref Health Africa and MoHSS. Malaria Microscopy Refresher Training. Juba; 24-28 July 2017.
7. Bosman A. WHO Technical Consultation on External Competence Assessment of Microscopists for Malaria. Malaria Policy Advisory Committee Meeting - World Health Organization, Geneva; 10-12 April 2019.
8. World Health Organization. Malaria Microscopy Quality Assurance Manual – Version 2. Geneva; 2016; 91.
9. Odhiambo F et al. [Factors associated with malaria microscopy diagnostic performance following a pilot quality-assurance program in health facilities in malaria low-transmission areas of Kenya.](#) Malaria Journal. 2017;16:371
10. Diallo MA et al. Quality control of malaria microscopy reveals misdiagnosed non-falciparum species and other microscopically detectable pathogens in Senegal. Ann Clin Microbiol Antimicrob. 2018;17:8.