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Establishing national malaria slide bank: Key strategy for implementing reliable proficiency testing external quality assessment and microscopy training programs

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Background: Despite the provision of microscopy trainings for health workers and implementation of proficiency testing (PT) external quality assurance (EQA) programs implemented in most countries, few countries have the capacity to produce and use validated blood film slides to ensure the sustained reliability of the trainings and EQA programs. Ethiopian Public Health Institute (EPHI) has partnered with ICAP and Malaria Care for mass production of validated malaria blood film slides with the aim of establishing the nation's first malaria slide bank.

Methods: *Plasmodium falciparum* (Pf) and *Plasmodium vivax* (Pv) positive slides were prepared at Adama Malaria Control Center from blood specimens collected from consented adult patients. Negative slides were prepared from blood collected from volunteer visitors from non-malaria endemic countries with no history of malaria and travel to malarious areas. Between 200-400 blood film slides were prepared from each donor. The blood film slides were examined by WHO-certified expert microscopists for species identification and then characterized and validated by polymerase chain reaction (PCR). The slides were archived using a custom-made slide bank database and storage cabinets with capacity for 10,000 slides.

Results: A total of 10,742 (9,045 Pf and Pv positive; 1,697 negative) validated blood film slides were collected from 35 donors. Validated malaria slides sets containing blood films slides of negative, Pf, Pv, mixed Pf/Pv and *Borrelia* spp will be used during in-service and pre-service malaria microscopy trainings at regional reference laboratory training centers and pre-service laboratory teaching universities, respectively. In addition, 995 facilities that are currently enrolled in regional PT EQA programs in five regions will receive the validated malaria PT slides.

Conclusion: Establishment of the slide bank enabled the national malaria program to use standardized and validated slides for quality in-service and pre-service malaria microscopy trainings, competency assessment of microscopists, laboratory mentorship programs, and regional malaria microscopy proficiency testing EQA programs.

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