

PhD defence Pierre Mukadi Kaningu

External quality assessment as a tool to assess the performance of the laboratory diagnosis of malaria and sleeping sickness among diagnostic laboratories in Democratic Republic of the Congo.

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Registration not required



Dit is de omschrijving

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Summary:

The present PhD project was conducted in Democratic Republic of the Congo (DRC) and focused the performance the diagnosis of malaria and human African trypanosomiasis at by laboratory health care workers. The objectives were to assess microscopy of blood parasites, and reading/ interpretation malaria Rapid Diagnostic Tests (RDT) through sessions of External Quality Assessment (EQA, whereby a reference laboratory sends samples to laboratories for assessment), produced by the National Institute of Biomedical Research, Kinshasa. Two EQA sessions of microscopic diagnosis and two sessions of photograph-based EQA of reading and interpretation of malaria RDTs were performed in the DRC between 2011 and 2014. EQA slides and malaria RDT photographs were distributed through collaborators of national tuberculosis control program and provincial health divisions. For microscopy, data were assessed per laboratory (n = 277 and 400 respectively), for malaria RDTs, data were assessed per laboratory health care worker (n = 1,849 and 2,344 respectively) who replied by Short Message Service (SMS).

The microscope slides contained *Plasmodium falciparum*, *Plasmodium non falciparum*, mixed *Plasmodium falciparum* and *Trypanosoma brucei* spp., *Trypanosoma brucei* spp. and no parasites. Overall, 35.0% of the laboratories reported all four slides correctly in first session and 4.1% for all five slides in the second. Major errors included false positive results (19.0 and 31.4% of laboratories in both sessions), misidentification of *Plasmodium non falciparum* (89.0 and 93.8%) and failure to recognize *Trypanosoma* (50.4 and 55.1%). Main errors in reading and interpretation of malaria RDT reported were failure to recognize invalid or negative test (8.4 - 32.5% of laboratory workers), overlooking faint and weak test lines (3.3 - 31.2%) and incorrect identification of the *Plasmodium* species (3.4 - 17.4%). Dedicated training with regular sessions EQA were shown to improve microscopy diagnosis and HW competence.

In conclusion, among diagnostic laboratories in DRC, performance of blood parasite microscopy including non-falciparum species and *Trypanosoma* was poor. Moreover, the studies revealed common errors in reading and interpretation of malaria RDT results. EQA sessions proved to be feasible in resource poor settings.

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