malaria positive versus malaria negative cases. This creates an extra burden wherein both *Plasmodium falciparum* and *P. vivax* are prevalent and require different treatment regimens. To further improve and validate the algorithm to identify the presence of *P. falciparum* and *P. vivax* species, we are conducting a validation study at three study sites in India: Sheopur (Madhya Pradesh), Jagdalpur (Chhattisgarh) and Udaipur (Rajasthan). To date, screening of 11,322 febrile patients has resulted in enrolment of 1,699 patients. Of the 1,699 febrile patients, a total of 345 patients were malaria positive by both microscopy and RDT. The PCR analysis of 1,373 samples yielded 509 malaria positive cases. Most of the malaria cases were caused by *P. falciparum* (63%) followed by *P.vivax* (18%), *P. falciparum* + *P.vivax* (14.5%), *P. falciparum* + *P. malariae* (2%), other mixed (1.7%) and *P. malariae* (0.4%). The comparative analysis with PCR as gold standard and improvisation in algorithm is currently ongoing, and the results will be presented at the conference.

0628

IMPROVING THE COMPETENCE OF MALARIA MICROSCOPISTS THROUGH BASIC MALARIA DIAGNOSTIC REFRESHER TRAINING, MADAGASCAR, 2019-2021

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High quality microscopy remains the reference method for malaria diagnosis and allows for parasite detection (PD), parasite species identification (ID), and parasite count (PC). In Madagascar, where *Plasmodium falciparum*, *vivax, ovale* and *malariae* all exist, microscopists have limited skills due to a lack of malaria microscopy (MM) training, validated malaria species slides for practicing, and adequate supervision. To improve MM quality, PMI Impact Malaria supported the Government of Madagascar to conduct ten, five-day basic malaria diagnostic refresher trainings (bMDRT) from August 2019 to March 2021. Trainings included didactic and practice sessions on microscope maintenance, slide preparation, staining and reading, and quality assurance. Improvement was measured by comparing pre- and post-test scores on a written exam and by assessing competency in reading validated malaria slides. In line with WHO-defined proficiency levels, we aimed for participants to achieve scores of at least 80% for PD and ID and at least 40% for PC. A total of 188 microscopists completed one five-day training; microscopists from all 22 regions of the country were represented. The mean written test score increased pre to post from 33% (range, 8-100%) to 57% (range, 8-100%). Slide reading average scores increased from 70% (range, 0-100%) to 88% (range, 29-100%) for PD, 43 (range, 0-91%) to 60% (range, 9-100%) for ID, and 15% (range, 0-100%) to 30% (range, 0-100%) for PC. A total of 149 (79%), 39 (21%), and 67 (36%) participants achieved a WHO proficiency score of at least level B in PD, ID and PC, respectively. Malagasy microscopists' diagnostic skills improved after a five-day training; nearly 80% demonstrated competence in PD; however, ID and PC will require additional practice and training. Cyclical training and supervision will be important to improve overall microscopy skill levels to meet WHO proficiency level B. In addition, supplying microscopists with validated slides of the four malaria species would allow them to continuously practice their MM skills.

0629

SERIOUS HAEMOLYSIS DURING PRIMAQUINE RADICAL CURE TREATMENT OF PLASMODIUM VIVAX MALARIA: A SYSTEMATIC REVIEW AND DESCRIPTIVE ANALYSIS

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Primaquine (PQ) is the only widely available drug that kills *Plasmodium vivax* hypnozoites. It can cause serious drug induced haemolysis in individuals with glucose-6 phosphate dehydrogenase (G6PD) deficiency. We conducted a systematic review of all clinical trials, prospective cohorts, case-control studies and case reports published between 1900 and 2020 that included individual patient data reporting serious haemolysis associated with PQ radical cure of vivax malaria. Serious haemolysis was defined as a requirement for hospitalization, blood transfusion, renal replacement therapy or death thought to have been attributable to either haemolysis or anaemia. A total of 17 eligible studies with 157 patients from 11 countries were identified. Overall 79.6% (121/152) of cases were prescribed with a high dose of PQ (>0.5 mg/kg/day) for radical cure and, at the time of hospitalization, the median total dose of PQ received was 2 mg/kg (IQR 1.5-2.5; range 0.5-5). The most common clinical presentations were pallor (92.7%, 102/110), jaundice (90%, 126/140) and dark urine (89.1%, 98/110). Of 153 patients with a documented G6PD activity result, 94.7% (n=145) had G6PD deficiency. The first symptoms of haemolysis were reported within 5 days of initiation of treatment in 92.3% (96/104) of cases, with most reported on 3rd (24%, 25/104) and 4th day (24%, 25/104). All patients were hospitalized for serious haemolysis within 7 days of the first dose of PQ. Overall 57.8% (74/128) of patients required transfusion and 6.7% (8/119) were dialyzed. Of 157 patients, seven (4.5%) died. The remaining patients were discharged from hospital after a median of 4 days (IQR: 3-6). Even with G6PD testing, enhanced monitoring for severe haemolysis is warranted following PQ radical cure. Our findings suggest that clinical review within the first 5 days of treatment may facilitate early detection of haemolysis, reduce hospitalization and improve outcomes of patients who are prone to serious PQ-associated haemolysis.

0630

OPTIMIZATION OF OUTREACH TRAINING AND SUPPORTIVE SUPERVISION PLUS (OTSS+) TO IMPROVE MALARIA DIAGNOSTICS SERVICE DELIVERY IN SIERRA LEONE

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The WHO recommends that malaria treatment be based on a parasitological test (either microscopy or Rapid Diagnostic Tests) for rational use of drugs. Quality assured malaria microscopy (MM) is the gold standard used for the management of severe malaria. The President's Malaria Initiative Impact Malaria (IM) project supports the Sierra Leone National Malaria Control Program (NMCP) in the implementation of Outreach Training and Supportive Supervision Plus (OTSS+), an approach in which government laboratory (lab) supervisors use an electronic supervisory checklist to monitor and improve provider performance through quality supportive supervision at the health facility (HF) level. The first round of lab OTSS+ in Sierra Leone occurred Oct- Dec 2020