Discussion Brief: Presumptive treatment, Rapid Diagnostic Test, and the need for differential diagnosis
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Effective case management of malaria is essential in the context of increasing drug resistance. The recent WHO guidelines recommend prompt parasitological confirmation by microscopy or alternatively by Rapid Diagnostic Tests (RDTs) in all patients suspected of malaria before treatment is started, and that treatment solely based on clinical suspicion should only be considered when a parasitological diagnosis is not accessible.

In malaria-endemic countries, people commonly assume they have malaria when sick and treat themselves accordingly. Of equal concern is that negative test results—meaning no malaria—are often ignored and patients treated anyway. (Whitty, 2008; Juma, 2011). Although RDTs have been shown to be robust diagnostic tools, and a couple are commonly used in countries (Batwala, 2010; Singh, 2005), “one size does not fit all;” if parasite prevalence in the population is low, a diagnostic test is relevant; if the prevalence is high, the test does not provide information of any clinical usefulness, as happens with any test in medicine when the prevalence of the tested characteristic is high in the healthy population. (Grass, 2011)

Members representing a broad range of health professions and organizations spanning four continents (Asia, Africa, North America and Europe) discuss challenges in misdiagnosis and presumptive treatment, as well as policy, training, and behavior change.

Key Points
- Many studies report misdiagnosis of malaria when using clinical signs alone. This is bad for patients as alternative diagnoses are missed and thus not treated, and expensive treatment may be prescribed and used unnecessarily.
- There are many factors: cultural, social, etc. why negative RDTs are ignored, but these are not clearly understood yet. Chandler et al. (2008) noted that from the diagnostic tools themselves, three spheres of social influence could be identified as causes of over-diagnosis: providers’ initial training emphasizing malaria, the influence of peers, and the pressure to conform to patients’ preferences. They recommend accounting for the various social influences affecting clinicians and moving “mindlines closer to guidelines.”
- In urban and rural Tanzanian populations, researchers used all possible diagnostic tests to determine the etiology of childhood fevers. Only 12% were malaria.
- Differential diagnosis may vary from region to region and should be expanded if the RDT is negative.
- Johanna Daily, MD, infectious disease specialist with active collaborations in Malawi, Rwanda and Ethiopia, notes that studies on differential diagnosis, such as the one done by Denise Njama-Meya et al. in Uganda on the risks and benefits of only treating children with microscopy confirmed malaria using a prospective cohort design, should be repeated in other regions to find out what the true prevalence of malaria is and define the other causes of fever to improve and inform local care.
- In the absence of a robust clinical algorithm around what should be done when the RDT is negative, the adherence to treatment guidelines remains moderate or poor.
- A member in the Democratic Republic of the Congo explained in French that in hyper endemic areas in Africa where there is little to no laboratory capacity or RDTs, presumptive treatment should be encouraged. Studies have shown that test positivity among febrile children in excess of 80% has been documented following a flood disaster in Mozambique (81%) and in the DRC (82%) (Hawkes et al. 2009). Thus, it may be good to use the regional level of malaria endemicity to guide presumptive treatment for malaria of patients presenting with fever.
- Microscopy services at rural clinics are not always available when feverish patients arrive after hours.
- Policy-makers should include the use of RDTs, microscopy, and differential diagnosis in the fever sections in national treatment protocols (see the example of Papua New Guinea), and also update protocols according to new WHO guidelines.
- Even in countries with updated protocols, such as Kenya, “old habits don't die,” i.e. many health workers still believe that fever equals malaria. More training and education of both clinical staff and patients are needed to change behaviors and improve case management.
- According to a WHO report, there are upwards of 70 RDTs on the market, with about 48% regulated (2010). The authors point out that it is important to consider the particular population when interpreting
product performance since the clinical sensitivity of an RDT is highly dependent on local conditions. Recommendations for policy-making for case management are provided here and by the WHO-Regional Office for the Western Pacific/TDR here. This also calls for more local studies and data on its sensitivity profile depending on the dominant parasitic species so as to streamline RDTs, such as in Malawi.

- Specific RDTs have been shown to be robust diagnostic tools and are commonly used in countries (Batwala, 2010; Singh, 2005). But they are not readily available everywhere.

**Key References**

- Swarthout TD, Counihan H, Senga RK, Broek I van den. *Paracheck-Pf accuracy and recently treated Plasmodium falciparum infections: is there a risk of over-diagnosis?* Malar J 2007, 6:58 (Full text)

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*Please consider replying to this discussion with the following information*

- Method(s) used to diagnose malaria in your health center; availability and reliability.
- Experience with presumptive treatment for malaria. Also consider sharing your treatment protocols.
- When the RDT is positive, is the correct treatment available? When the RDT is negative, what are the next steps usually taken? Does your program use differential diagnosis?