

## **Malaria: Validation of a school-based model using WHO endorsed care to reduce child morbidity.**

This model uses rapid diagnostic testing (RDT) and treatment with artemisinin combination therapy (ACT) by trained teachers in schools. It provides accurate diagnosis and prompt treatment for malaria for children identified as sick at school, makes WHO recommended interventions available 'downstream' in rural areas and is an approach to reducing malaria morbidity in children that can be applied worldwide. A secondary benefit is that during this school-based program children's knowledge about malaria improved and community health practices related to prevention, and diagnosis and treatment, changed.



**“A teacher in a rural Ugandan school shows children how a rapid diagnostic test kit is used test for malaria.”**

The model was validated using the duration of absence from school due to illness as a surrogate measure for morbidity in a 2 year program evaluating the intervention in 4 primary schools in rural Uganda. In year one (Pre-intervention) daily data was collected on all children identified by teachers as sick in class and subsequently absent – traditionally such children are sent home and their subsequent care devolves to their parents. In year two (Intervention) volunteer teachers trained in year one used RDT to test all children identified as sick and treat those positive for malaria with ACT at school.

The methodology and results have been published.<sup>1,2</sup>In brief, pre-intervention (year 1) 953 of the 1764 pupils were sent home due to illness; parents only took 1 in 4 to clinics for diagnosis or anti-malarial treatment. Mean duration of absence was 6.5 (SD 3.17) school days. In year 2 1066 of the 1774 pupils were sick, all had teacher administered RDT, 765/1066 (68%) tested positive for malaria and received ACT; their duration of absence fell to 0.59 (SD 0.64) school days ( $p < 0.001$ ), and overall absence decreased to 2.55 days from 6.5 in year 1

( $p < 0.001$ ). This translates on average as a reduction from a week and half lost from school due to malaria to less than 24 hours.

In addition, in year 1 < 1:5 of 1764 pupils had basic knowledge about malaria (that it is caused by mosquitos; can be prevented; requires rapid diagnosis and prompt medication). By year 2 all children knew the signs and symptoms of malaria and had essential epidemiological knowledge.

Twelve months post intervention the universality of this knowledge has been sustained in spite of new pupil enrollment, and the whole school focus on malaria continues. Children report better health, more consistent attendance and improved academic achievement; they pass key health knowledge to new pupils and have become proactive in prevention strategies; and 6% fewer test positive for malaria.

Cost for the test kits and ACT medication is low in part due to initiatives by Gates and Clinton Foundations and others to make RDT and ACT available; teachers willingly volunteered their time. Prior studies have identified the efficacy of the RDT/ADT approach and that staff with minimal training can reliably administer care. However, the approach of empowering teachers and making prompt diagnosis and treatment available in schools is novel. Malaria morbidity is high in part because most children sent home are not taken by their parents for WHO recommended diagnosis and treatment; in sub-Saharan Africa malaria is the principal reason a child will be absent from school and the main cause of death in school-age children.

In addition to being applicable worldwide this model uses WHO endorsed testing and treatment and is in keeping with the call by the WHO Commission on Social Determinants of Health for innovative school-based interventions to tackle health challenges faced by young people.<sup>3</sup>

1. Macnab AJ, Mukisa R, Mutabazi S, Steed R. Malaria in Uganda: school-based rapid diagnostic testing and treatment. *Int J Epidemiology* 2016; doi: 10.1093/ije/dyw262
2. Macnab AJ, Mutabazi S, Mukisa R, Eliab AM, Kigozi H, Steed R. The impact on absence from school of rapid diagnostic testing and treatment for malaria. *Int J Learning Teaching and Educational Research*. 15 (7), 20-37 (2016).
3. Commission on Social Determinants of Health. Closing the gap in a generation: health equity through action on the social determinants of health: final report of the commission on social determinants of health. World Health Organization, Geneva. (2008).