Photoessay

Malaria in Uganda: school-based rapid diagnostic testing and treatment

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Malaria is the main reason a school-aged child in sub-Saharan Africa will die and the principal reason why a child will be absent from school.1–3 The duration of malaria-related absence, frequency of absence due to repeated infection, residual malaise from suboptimal treatment or permanent neurological complications of falciparum malaria can all compromise a child’s potential to learn.2,4,5

The burden of malaria is greatest among children in low-resource settings and rural areas. Diagnosis and treatment are not straightforward as symptoms are not specific, diagnostic blood tests are often not readily available and lack of knowledge and limited access to care contribute to morbidity and mortality.6 The World Health Organization (WHO) advocates early, accurate diagnosis and prompt, effective treatment, and recommends combined use of Rapid Diagnostic Test (RDT) kits and administration of Artemisinin Combination Therapy (ACT).7 However, the social engagement required to make RDT/ACT accessible to rural populations in developing countries is largely missing.8 RDTs require a drop of blood;9,10 if malaria antigens are present they bind to the dye-labelled antibody in the kit, forming a visible complex in the results window. Their sensitivity and specificity mean they can replace conventional testing for malaria.11,12

ACTs are the best anti-malarial drugs available nowadays; WHO recommends them as first-line therapy worldwide for P. falciparum malaria.13–15 ACTs combine artemisinin, which kills the majority of parasites within a few hours of treatment starting, with a partner drug of a different class and longer half-life, which eliminates residual parasites16.

We implemented a school-based intervention in four low-resource communities in Uganda where teachers were trained to conduct RDT and administer ACT among children falling sick at school, and evaluated the effect on absenteeism as a surrogate for morbidity due to malaria.17 Sick children are usually just sent home for parents to manage. Year 1 involved baseline data collection, community enquiry on malaria management, and teacher training; in year 2, all sick children had a teacher-administered RDT and prompt ACT treatment if they tested positive.

Community engagement had identified absenteeism due to malaria as a major problem. In ongoing dialogue with school and community leaders, school-based RDT/ACT was chosen as the best, locally achievable intervention. Delivery was readily implemented and sustained in four rural primary schools; teachers participated willingly. Pre-intervention (year 1), 953 of 1764 pupils were sent home due to presumed infectious illness. At home, parental management only approached WHO standards for accurate diagnosis and prompt treatment of malaria in 1:4 children, and the mean duration of absence from school was 6.5 [standard deviation (SD): 3.17] school days. During school-based teacher-administered RDT/ACT (year 2), 1066 of 1774 pupils were identified as sick, 765 of these
Malaria is the principal reason for which a child misses school in Africa. In low-resource communities, knowledge on the mechanisms of infection and awareness of effective preventive methods are often lacking; 50% of Ugandan households own a mosquito net and 77% of children do not sleep under insecticide treated nets. Net use is a rarity due to limited knowledge of the mechanisms of infection and methods for effective prevention.

had a positive RDT and received ACT, and their duration of absence fell to 0.6 (SD: 0.64) school days; \( P < 0.001 \) (many treated pupils soon felt well enough to return to class of their own volition rather than go home).
RDT and ACT are widely employed, but their use by trained teachers in a school-based initiative to address the health-related consequences of malaria on absenteeism has not previously been implemented. Our model represents a

Figure 6. A teacher obtaining the finger prick blood sample to conduct an RDT at a participating school. Immediate treatment of those positive reduced duration of absence from approximately 1 week to < 1 day.17

Figure 7. Project data collection sheet developed to capture each school’s daily count of pupils present and absent.

Figure 8. Pictogram used for community education regarding conduct of the RDT for malaria.

Figure 9. Community teaching session at participating school. Pre-intervention < 1:5 children knew that malaria is mosquito borne, can be prevented and responds to rapid diagnosis and prompt treatment; post-intervention essentially 100% had this knowledge.17 Children respond to questions with a show of hands and stand up to give answers or ask questions.

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community-based approach applicable globally where morbidity from malaria is high.

The people (identifiable) photographed have given their consent for their pictures to be used in the dissemination and publication of this research.

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**References**