EXECUTIVE SUMMARY

Malaria, diarrhea and respiratory infection are the most common illnesses causing morbidity and mortality amongst children under five years of age in Uganda, accounting for 46% of deaths in this age group 1. The disability-adjusted life years (DALYs) for these three illnesses, which measures the burden of disease by calculating the number of years lost due to ill-health, disability or early death, is 3.7 million years for Ugandan children under 14 years of age 2. Of the three illnesses, malaria is the most common cause of death in children under five, accounting for 32 percent of deaths in this age group 3. In addition, malaria is the number one reported disease in Uganda, and is estimated to account for 30-50 percent of the outpatient burden and 35 percent of hospital admissions. At Bugoye Health Center III, Kasese District, where this study will take place, malaria is the most prevalent disease condition at the outpatient department, accounting for 52% of patient visits seen between June 2009 and June 2010.

The heaviest burden from malaria falls on children in Africa, where the disease inflicts further harm through its effects on malnutrition, anemia, and increased risk for other infections. Early treatment of uncomplicated cases can markedly reduce or prevent severe malaria and malaria deaths. Yet worldwide, over 70% of children with malaria use traditional remedies or local treatments before presenting to health facilities, thus increasing the risk of severe malaria and death. When children are seen in health facilities, the quality of care may be poor and drugs are often stocked out, eroding public confidence and perpetuating the problem of delayed presentation.

In Uganda, previous national strategies have attempted to deliver presumptive anti-malarial treatment of febrile episodes through Village Health Teams (VHTs). Elected by their communities to serve on a voluntary basis, Village Health Workers (VHWs) perform a range of health promotion activities. A new national strategy, called Integrated Community Case Management (ICCM), proposes upgrading VHT activities to include diagnosis and treatment of malaria, pneumonia, and diarrhea at the community level, with the overall goal of reducing under-five mortality. However, due to resource constraints, ICCM has not yet been implemented nationwide.

Within Bugoye Sub-County, the five villages of Kikokera, Ihani, Muramba, Kanyaminigo, and Bugoye have experienced a steep spike in malaria incidence following installation of a neighboring hydroelectric project. According to Bugoye Health Center III (BHC) records, these five villages accounted for more than 2000 cases of malaria in 2010 – nearly half of all malaria cases seen at the health center from across the Sub-County. In the context of a new partnership between the Bugoye community (represented by the health center as well as local civil and administrative leaders), Mbarara University of Science and Technology (MUST), and Massachusetts General Hospital (MGH), a solution was proposed to implement and evaluate the ICCM framework in the five villages most heavily affected by malaria in Bugoye Sub-County.

The Bugoye Integrated Community Case Management Initiative (BIMI) is a five-year operational research study designed to evaluate the implementation of ICCM in five intervention villages compared to five control villages in Bugoye sub-county. BIMI has four specific aims:

Aim 1: Strengthen implementation of ICCM in five villages in Bugoye sub-county.
Aim 2: Evaluate the efficacy of ICCM in reducing severe malaria and malaria, pneumonia, and diarrhea-attributable deaths in children under five years old.

Aim 3: Evaluate the proper use and acceptability of RDTs at the community level and the impact on rational prescribing of ACTs.

Aim 4: Evaluate the proper use of pre-referral rectal artesunate administration by VHWs for severe malaria at the community level.

**General Study Design**

Implementation of the Ugandan ICCM framework will be strengthened in seven areas: community engagement; training and supervision; appropriate case management; insecticide-treated bednet usage; medication supply; diagnostic supply; and monitoring, evaluation, and quality assurance.

We will evaluate the combined effect of this package of interventions on the incidence of severe malaria and malaria, pneumonia, and diarrhea-attributable deaths compared to baseline in five intervention and five control villages in Bugoye Sub-County. These data will be captured using a cross-sectional survey, adapted from the Ugandan Demographic Health Survey, that will be administered in the five intervention and five control villages at baseline and then prospectively every six months.

We will also evaluate the appropriate use of rapid diagnostic tests (RDTs), artemisinin combination therapy (ACT), and pre-referral rectal artesunate by VHWs. Performance data will be captured through a combination of skills testing, clinical observation, and review of VHW documentation. Every VHW will be observed and given performance feedback at least once every three months, with the goal of improving the quality of care delivered by VHWs and increasing the proportion of children who are seen and appropriately evaluated within 24 hours of fever onset.

**Significance and Innovation**

BIMI will directly improve the care of approximately 800 children in the five villages most heavily affected by malaria in Bugoye Sub-County. BIMI’s package of interventions is also designed to strengthen the VHT system, develop closer links between BHC, VHTs, and local communities, and provide a stable platform for future primary care initiatives.

BIMI will also address several areas related to home management of malaria where evidence is currently lacking. These include the appropriate use of RDTs, ACTs, and rectal artesunate by VHWs. BIMI overcomes local resource constraints in order to implement Uganda’s ICCM strategy through the public sector. BIMI’s monitoring and evaluation tools are either directly imported or adapted from existing Ministry of Health instruments. Therefore the results that emerge from this work may help inform the future implementation of ICCM elsewhere in Uganda.

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1 World Health Organization Department of Measurement and Health Information, Global Health Observatory Data Repository - Disease and injury country estimates, 2008 by age and sex. 2011: http://apps.who.int/ghodata/?vid=10012.
