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**Division of Global Health (IHCAR), Department of Public Health Sciences**

# **MANAGING MALARIA IN UNDER FIVES: Prompt access, adherence to treatment and referral advice in rural Tanzania**

**AKADEMISK AVHANDLING**

som för avläggande av medicine doktorsexamen vid Karolinska Institutet offentligen försvaras i Samuelsson-salen, Tomtebodavägen 6, Solna.

**Onsdagen den 15 december, 2010, klockan 09.00**

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**Stockholm 2010**

## ABSTRACT

**Background:** Nearly a million people die of malaria each year, the majority are children in rural African settings. These deaths could be reduced if children had prompt access to artemisinin-based combination therapy (ACTs), demonstrated adherence to treatment and to referral advice for severe malaria. However, health systems are weak to deliver the interventions. Although many African countries, including Tanzania, changed malaria treatment policy to ACTs in the last decade, few children reportedly get prompt access to ACTs.

**Main aim:** To determine factors influencing prompt access to effective antimalarials; adherence to treatment schedules and to referral advice among children under five, in rural settings.

**Methods:** Community-based studies were conducted in rural villages in Kilosa (I,II) and Mtwara rural (II,IV) districts, in Tanzania. Study I and II were prospective designed while study III and IV were nested in a community-based rectal-artesunate deployment intervention study. In study I, a total of 1,235 children from 12 randomly selected villages were followed up for six months. Caretakers of children reported to have fever were interviewed at home about the type and source of treatment using a questionnaire. In study II, all children (3918) in five selected villages were followed-up for 12 months, to determine adherence to treatment when they had malaria, diagnosed using Rapid Diagnostic Test (RDT) and treated with artemether-lumefantrine (ALu). In study III, 587 children who received pre-referral rectal artesunate during the deployment study were traced home and caretakers interviewed on a number of factors likely to influence adherence to referral advice, using a questionnaire. Study IV was qualitative, 12 focus group discussions were conducted in three purposively selected villages to explore reasons for non-adherence to referral advice.

**Results:** Only one-third (37.6%) of febrile children had prompt access to ALu, the recommended ACTs in Tanzania, mainland (I). Lack of prompt access was mostly (>80 percent) attributed to receiving non-recommended drugs. Less than half of the febrile children were taken to government facilities, where they were 17-times more likely to have prompt access compared to those who went elsewhere. Less than 10% (41/607) of febrile children had access to ALu (I) from faith-based organisation facilities and accredited drug dispensing outlets, despite having subsidized ALu. Reported adherence to treatment schedules was high (>80 percent) and non-adherence was attributed mainly to untimely dosing, rather than taking a fewer number of doses (II). While social economic status influenced prompt access to ALu and adherence to treatment, basic education did not (I, II). Caretakers of children with altered consciousness and convulsion were almost 4-times more likely to adhere to referral advice than those whose children had less severe symptoms (III). They seemed to weigh child condition against obstacles to accessing care at health facilities, if the condition was less severe prior to or improved after rectal artesunate dose, caretakers were likely to be deterred from adhering to referral advice (IV). Detailed understanding of provider's advice was likely to lead to adherence to the treatment schedule (II) and to referral advice (III, IV).

**Conclusion:** This thesis has shown that once a child had access to ALu, caretakers were likely to adhere to treatment schedule; and to referral advice, if child had severe symptoms or not improved after pre-referral treatment. More efforts should therefore be directed towards increasing access to ALu by strengthening the public health sector to reach rural remote areas. A wide coverage in prompt access to ALu will also reduce the need for the rectal artesunate strategy.

ISBN: 978-91-7457-160-8