

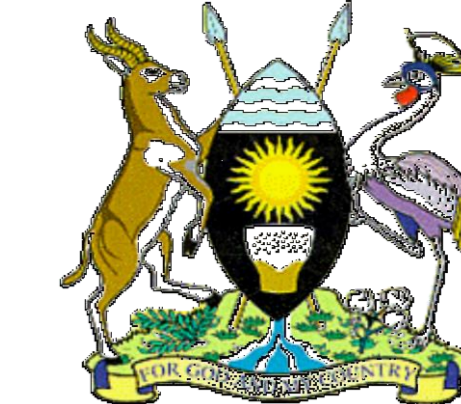
Health facility caseload changes during the introduction of community case management of malaria in Uganda

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Introduction

Malaria endemic countries have scaled-up community health worker (CHW) interventions to increase access to malaria testing and treatment to vulnerable communities with limited access to public health systems.

These interventions have the potential to reduce the health centres caseload by providing malaria diagnosis and treatment services within communities.

The aim of this analysis is to examine the effects of introducing a CHW-intervention on health centre attendances in South West Uganda.

Methods

Study Context

This study was conducted as part of a cluster randomised trial, which compared the impact of CHWs using malaria rapid diagnostic tests (mRDTs) on the proportion of children receiving artemisinin combination therapy (ACT) with CHWs using a presumptive diagnosis.

Table 1. The structure of the health system in Bwambara Sub-county, Uganda

Health Centre	Services	Number of Health Centres	Catchment Area	Population served	Malaria diagnosis method
Health Centre II	Outpatient	2	Parish	5,000	mRDT
Health Centre III	Outpatient, maternity, inpatient ward, microscopy	1	Sub-county & Parish	20,000	mRDT + light microscopy

Data Collection

- Data was extracted from out-patient department treatment registers during two time periods,
 - 12 months prior to the CHW-intervention starting (May 2009 - April 2010: **Pre-intervention period**)
 - 20 months of the CHW-intervention (May 2010 - Dec 2011: **Intervention-period**)

- Included all children visiting a health centre

Statistical Analysis

Longitudinal OPD attendance data was analysed using an interrupted time-series approach with segmented regression models.

Two main outcomes were examined:

- Malaria specific visits
- Non-malaria visits
- Overall visits

Model specification:

$$Y_t = \beta_0 + \beta_1 \times time_t + \beta_2 \times intervention_t + \beta_3 \times time\ after\ intervention_t + \epsilon_t$$

Y_t = Number of child visits (outcome) in month t at a health centre.

$time$ = Time in months at time t from the start of the pre-intervention period to the end of the intervention-period.

$intervention$ = Indicator variable for time t before the start of the CHW-intervention ($intervention=0$) or after the start of the CHW-intervention ($intervention=1$).

$time\ after\ intervention$ = Number of months after the CHW-intervention at time t .

β_0 = Estimates the number of visits per month at time 0 (baseline level of visits).

β_1 = Estimates the secular trend in the number of visits per month over the entire period.

β_2 = Estimates the level change in the number of visits per month immediately after the CHW-intervention.

β_3 = Estimates the change in trend in the number of visits after the start of the CHW-intervention.

ϵ_t = Error term at time t that represents random variability not explained by the model.

Results

Table 2: Changes in visits, results from segmented linear regression models

	Malaria visits	Non-malaria visits	Overall visits
Constant (β_0)	207.7** (70.9)	106.0*** (23.3)	296.3*** (46.5)
Secular trend (β_1)	19.2* (8.9)	5.6 (3.2)	32.7*** (6.3)
Change in level after intervention (β_2)	-245.0*** (65.9)	-39.8 (27.1)	-427.9*** (54.0)
Change in slope after intervention (β_3)	-27.1* (11.0)	-1.8 (3.5)	-32.3*** (7.0)

Standard errors in parenthesis; ***p<0.001, **p<0.01, *p<0.05;

Fig 1. Trends in malaria and non-malaria visits at all three health centres

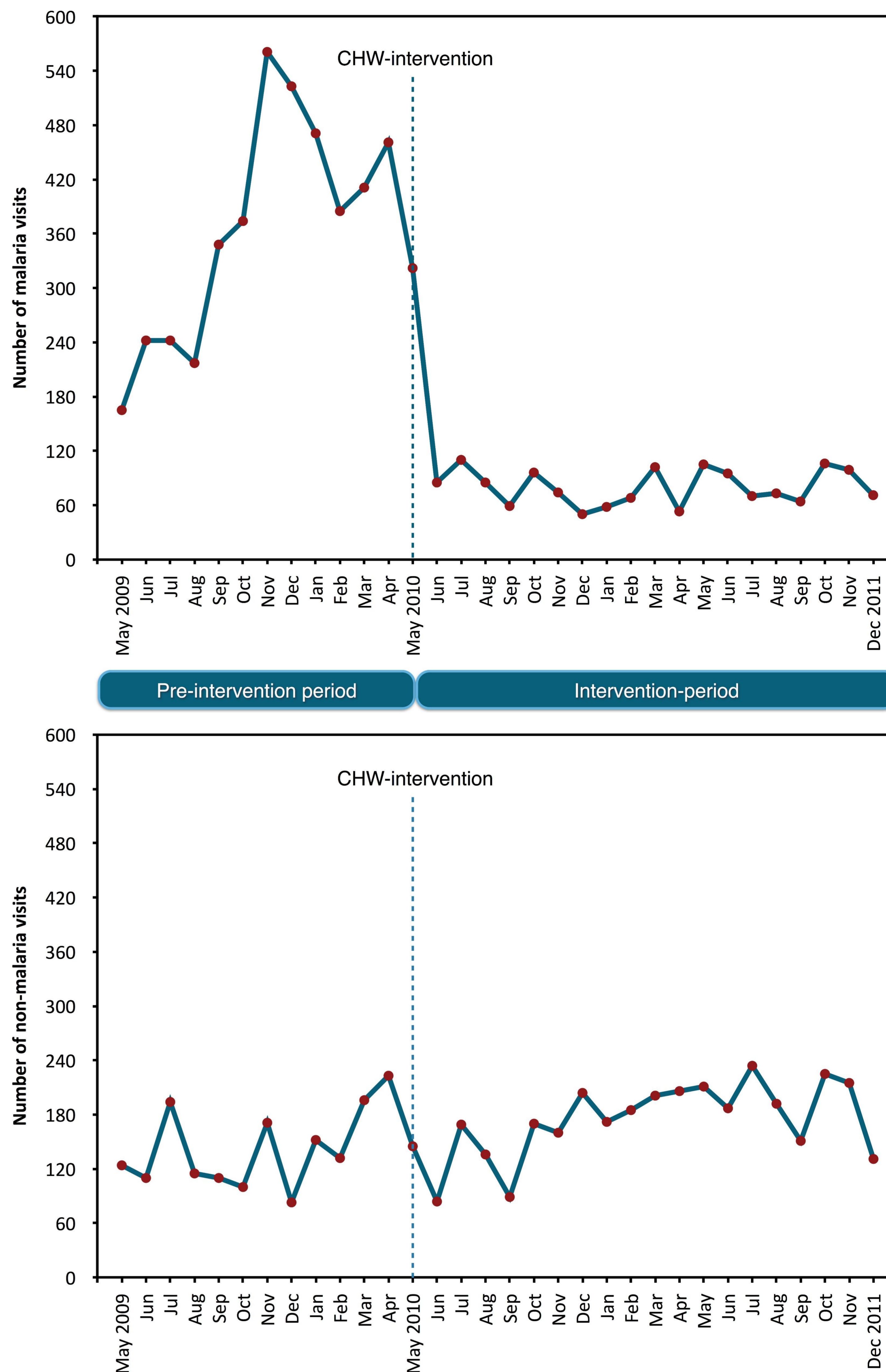


Table 3: Percentage change in visits

	Malaria visits	Non-malaria visits*	Overall visits
Immediate change	-68.5	-24.9	-63.0
% Change after 3 months	-68.6	-24.1	-67.9
% Change after 6 months	-75.8	-24.7	-71.2
% Change after 12 months	-86.8	-25.8	-76.1
% Change after 18 months	-94.5	-26.5	-79.5

*Non-significant

Summary of findings

- Malaria and overall visits declined sharply after the introduction of a CHW-intervention. Whilst, non-malaria trends remained the same.
- Three months after the intervention, malaria visits had declined by 69%, and overall visits by 63%, when compared to the pre-intervention period.
- The proportion of non-malaria diagnoses (respiratory tract infections, pneumonia, diarrhoea, helminths) increased as the proportion of children diagnosed with malaria decreased.

Conclusions

- Our findings indicate that CHW interventions are likely to reduce visits at health centres and may make more time available for health workers to spend time with patients.
- Health worker's role may be expanded to include additional tasks such as outreach services, or supervision of CHWs.