Community health workers and malaria

Does training to use rapid diagnostic tests improve targeting of malaria treatment?

Researcher interviews mother of a child recently treated by a community health worker

Community health workers can help patients in remote locations access prompt treatment, including artemisinin-based combination therapy (ACT), the most effective treatment for malaria.

In this study in Uganda, community health workers received training to use malaria rapid diagnostic tests (RDTs), how to prescribe ACTs to treat malaria, how to recognise signs of other infections in children, and when to refer patients.

The results showed an improvement in malaria diagnosis and appropriate treatment by community health workers, targeting ACTs to children with malaria and reducing the number of ACTs given to patients with other illnesses. However, RDTs did not detect malaria infections with a low number of parasites, which could lead to some infected children not receiving a malaria treatment.

Why are community health workers important?

- The World Health Organization (WHO) recommends community case management to increase access to prompt, effective malaria treatment, especially where there are limitations in the public health system.
- This approach covers malaria and other major or common childhood illnesses and is being scaled up in more than 25 sub-Saharan countries.
- The WHO also recommends that all patients receive a parasitological diagnosis before receiving malaria treatment, but there is still little evidence on how community health workers use RDTs, nor if this varies between areas with different malaria transmission intensity.

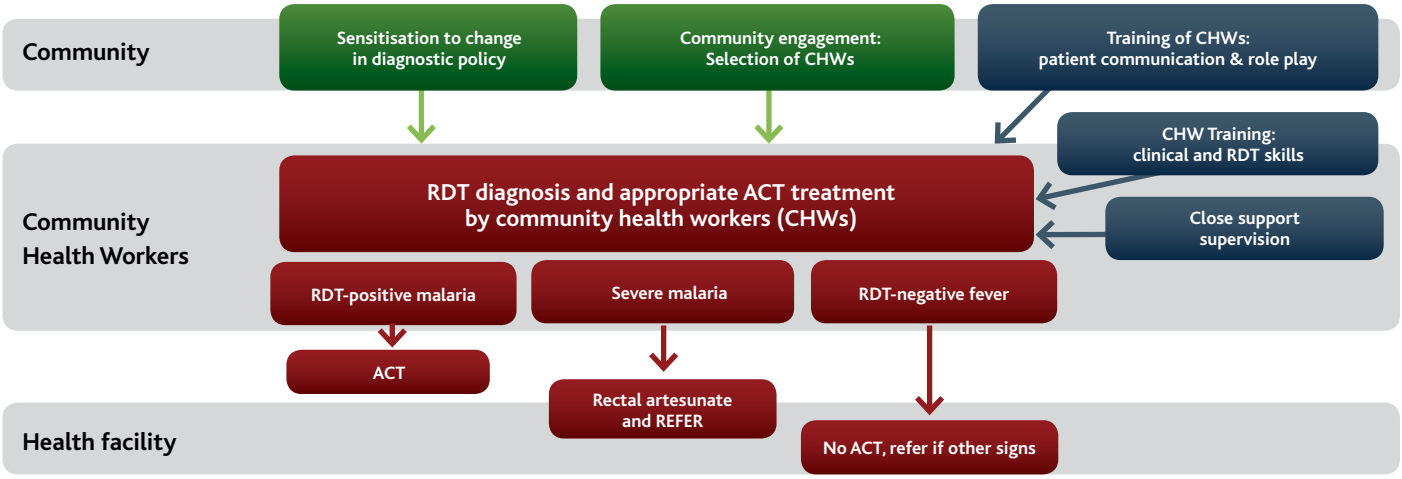
The Study

What: Two cluster-randomised trials. In each trial, 96 community health workers received training to diagnose malaria using RDTs; we compared them with 96 community health workers trained to diagnose malaria using signs and symptoms only.

Where: Two contrasting areas of high and low transmission in South West Uganda.

Why: What is the impact of training community health workers to use RDTs on malaria treatment practices and referral?

How:



1. In both intervention trials – in the low and high transmission setting – community health workers were trained to perform RDTs and prescribe malaria treatment only if the test was positive, and to look for clinical signs of other illnesses and refer if needed.
2. The training aimed to improve the clinical and diagnostic skills of community health workers, as well as communication with patients.
3. Community meetings were held to engage communities in selecting the community health workers to be trained and to make patients aware of the changes in malaria diagnosis.

Community health workers in Uganda receive bikes during their training in malaria diagnosis and treatment

What did the intervention include?	RDT group	Control group
3-4 day training workshops		
Reasons for policy change to RDT testing before malaria treatment	✓	
How to perform and interpret an RDT	✓	
What to do for children who have a negative RDT result	✓	
How to treat a child with malaria	✓	✓
How to recognise a child with signs of severe illness, and when to refer	✓	✓
How to recognise a child with fevers caused by other illnesses, and when to refer	✓	✓
Role play and communication skills	✓	✓
Supporting interventions for trained community workers		
Training certificate with Ministry of Health logo	✓	✓
Pictorial job aids	✓	✓
Bicycle, T-shirts, monthly kerosene allowance and soap	✓	✓
Close support supervision after training – only for first 6 months	✓	✓
Supporting interventions in the community		
Community health workers chosen by popular vote	✓	✓
Information meetings about RDTs in surrounding communities	✓	✓

What did we find?

- Over 85% of community health workers in both transmission sites complied with the results of the RDTs, reducing overprescription of ACTs.
- Fewer children treated by community health workers who used RDTs received an ACT compared to children treated by those using symptom-based diagnosis: 37% vs 99% in the high transmission area, reducing the number of ACTs used by over 60%. In the low transmission area, the number of ACTs used was reduced by 90%.
- ACTs were more accurately targeted where community health workers used RDTs, compared to where they made a diagnosis based on symptoms alone: 79% vs 31% of ACTs given were appropriate for patients' malaria infection status in the high transmission sites, and 90% vs 8% in the low transmission sites (both p<0.001).
- Treatments were missed in 11% of children seen by community health workers using RDTs in the high transmission area: they did not receive an ACT but microscopy showed that the children did have malaria. In the low transmission area, the rate of missed treatments was 4%. Many of these child had fewer than 200 parasites per microlitre of blood – the acknowledged limit of detection for most RDTs.
- Community health workers using RDTs also referred more children to health facilities, but less than 15% of the children referred were actually taken to a health facility.

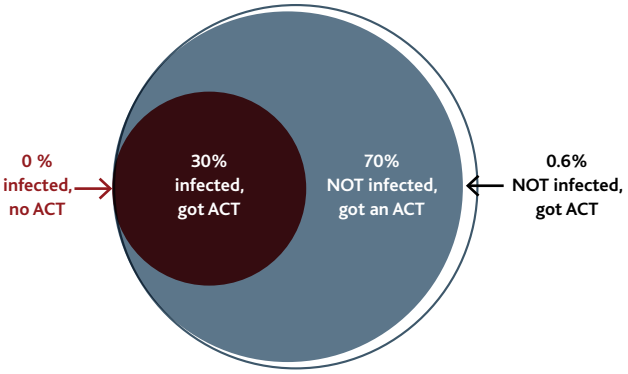
How was targeting measured?

We collected an additional blood sample from patients at the time of community health worker consultation, in order to determine later through microscopy if the child was infected with malaria parasites. This allowed us to assess whether the use of RDTs improved targeting of ACTs to patients with malaria, and reduced overuse of these medicines.

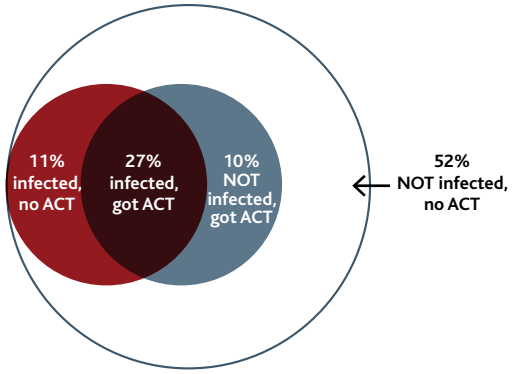
We examined treatment decisions made by community health workers who had been trained to use RDTs in relation to the child's malaria infection status, and compared them with treatment decisions made by community health workers trained to diagnose malaria based on symptoms alone.

High transmission area

a) Control group: Treatment decisions by community health workers making a diagnosis based on symptoms alone

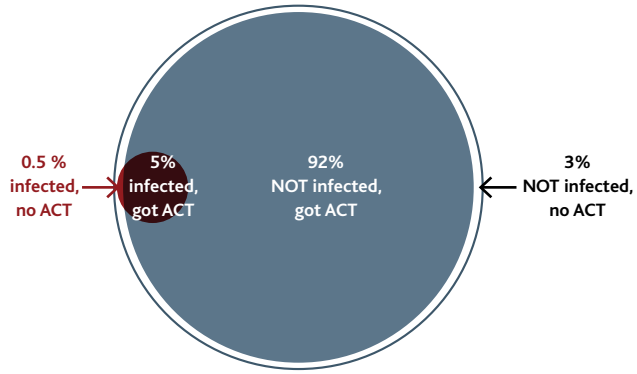


b) RDT group: Treatment decisions by community health workers using malaria rapid diagnostic tests

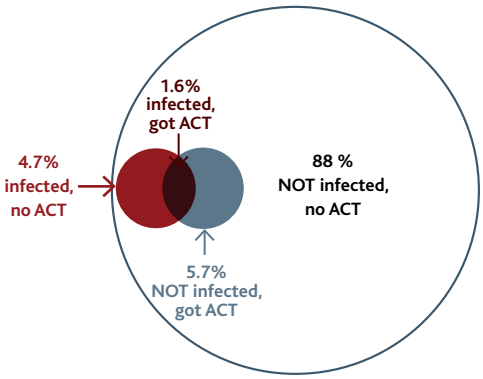


Low transmission area

c) Control group: Treatment decisions by community health workers making a diagnosis based on symptoms alone



d) RDT group: Treatment decisions by community health workers using malaria rapid diagnostic tests



Not infected | Infected | Treated with ACT | Infected and treated with ACT

Key learnings

From the project

- Trained community health workers can use RDTs and comply with results
- Caretakers are willing for their child to be tested by community health workers before receiving treatment
- RDT use by community health workers can improve the targeting of ACTs to malaria patients, and reduce overuse of these valuable antimalarials
- RDTs can fail to detect malaria infections when the number of parasites is small, which means that some infected children may not be treated. Under-treatment was most common in the low transmission setting, where almost 8 in 10 infected children were not detected or treated. In the high transmission area, approximately 3 in 10 infections were not detected
- Using RDTs can help community health workers to recognise fevers caused by other illnesses, and increase referral
- Using RDTs can increase the number of parents following the community health workers' advice of taking their children to a health facility, but referral visits remained low

For programme managers

- It is feasible to train community volunteers to perform and interpret an RDT test correctly
- Benefits of using RDTs to improve targeting of ACTs and limit their overuse need to be weighed against the risks of not treating an infected child
- Missed treatments may be more frequent in community-based treatment programmes compared to other health services, since patients may seek care at an earlier stage of their illness
- Missed treatments are more worrying in patients who have little immunity against malaria – for example where malaria transmission is low – and treating any case of fever with an ACT might thus be preferable to performing an RDT in community programmes in these regions
- Factors which hinder parents from taking appropriate action when a child is referred to a health facility could be a challenge for the effective management of childhood illness, and warrant further study

Children in Rukunguri, Uganda

Acknowledgements

Collaborating institutions: Ministry of Health, Uganda; University of Copenhagen, Denmark; London School of Hygiene & Tropical Medicine, UK

This study is supported by the ACT Consortium, which is funded by a grant from the Bill & Melinda Gates Foundation to the London School of Hygiene & Tropical Medicine

Contact

For further information about the project, including a video and training manuals in English, Portuguese and French, visit **www.actconsortium.org/RDThomemanagement**

Principal Investigators
Richard Ndyomugyenyi: **richardndyomugyenyi@gmail.com**
Sian Clarke: **sian.clarke@lshtm.ac.uk**

ACT CONSORTIUM