

## Scalable interventions to increase community health worker motivation and performance: Randomised controlled trials in Mozambique and Uganda



*A CHW treats a child using the inSCALE technology intervention in Mozambique, called inSCALE APE CommCare application*

### Key messages

- The inSCALE project's interventions increased appropriate treatment of sick children, not only by community health workers (CHWs) but also through alternative mechanisms.
- The inSCALE project found a highly motivated CHW workforce, challenging the widespread assumption that CHW motivation is a key driver of poor integrated community case management (iCCM) programme performance, though gaps in CHW performance persist.
- The inSCALE interventions have the potential to strengthen the iCCM programme, but they have not as yet been able to overcome barriers such as drug stockouts.

### Introduction

Evidence in African countries shows community health workers (CHW), if properly trained and equipped, have the potential to reduce child deaths from malaria, pneumonia and diarrhoea by up to 60 percent through the delivery of integrated community case management (iCCM) <sup>[1]</sup> – an approach whereby CHWs are trained to identify and treat pneumonia, diarrhoea and malaria in children under five years, as well as to refer severely ill cases to the nearest health facility.

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However, these programmes have faced challenges of scale-up owing to high CHW attrition rates and substandard quality of care. Consequently, there is an urgent need for strategies that improve performance, motivation and retention of CHWs <sup>[2,3,4]</sup>.

The Innovations at Scale for Community Access and Lasting Effects (inSCALE) project was a seven-year multi-country study that aimed to demonstrate that government-led iCCM programmes could be scaled up while maintaining quality of care by addressing the common barriers to iCCM implementation emphasised in the literature. The inSCALE project's aim was to be achieved by:

1. Identifying innovative solutions with potential to increase CHW motivation and supportive supervision;
2. Assessing feasibility and acceptability of these innovations among community members, CHWs, facility-based health workers and subnational and national health authorities;
3. Evaluating the impact of the selected interventions on CHW performance, motivation and retention and on the coverage of appropriate treatment for children with diarrhoea, malaria and pneumonia;
4. Costing the interventions and investigating their potential cost-effectiveness;
5. Promoting the implementation and spread of iCCM by sharing with the Ministry of Health (MoH), subnational health authorities and stakeholders the experiences and findings that improve coverage and quality of iCCM.

The inSCALE project was implemented in Uganda (Midwestern region) and Mozambique (Inhambane province), as both countries have a long history of implementing community case management for sick children.

## Methods

The inSCALE project conducted extensive formative research to develop two intervention packages that were evaluated through cluster randomised controlled trials.

The two interventions were:

- **The technology intervention:** This approach used low-cost technology to promote learning and increase CHWs' confidence and connectedness to the wider health system through the development of tools and applications for mobile phones. The mobile phones used in the study were selected based on the county context, with smartphones used in Mozambique and feature phones in Uganda. The mobile phone software inSCALE developed is intended to enhance CHW motivation and performance through job aids that support decision-making (Mozambique only), data submission and performance-related feedback, as well as closed user groups to allow free calls among CHWs and their supervisors.
- **The community intervention (implemented in Uganda only):**<sup>1</sup> This intended to promote CHWs as key village health assets to improve motivation and performance. This community mobilisation approach used the formation of Village Health Clubs, established on five key pillars and focused on a learning and action cycle, as a platform for participatory and locally owned identification of health problems and solutions.

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<sup>1</sup> As the local CHW strategy in Mozambique already incorporates substantial community components, the proposed inSCALE community intervention was not seen as sufficiently innovative for the Mozambique context. Therefore, and also because of time constraints, it was decided that Mozambique would implement only the technology intervention.

In order to assess the impact of these interventions on CHW motivation, retention and performance and the appropriate treatment of children (Objective 3) and to evaluate the cost of the interventions (Objective 4), the project:

- Performed surveys in both settings prior to implementation of the interventions to understand the baseline levels of CHW motivation, care-seeking for sick children and costs to families. This information was used to inform the randomisation of study clusters (sub-counties in Uganda and districts in Mozambique) into intervention and control arms.

Uganda: 13 sub-counties were randomised into the control, technology and community arms (total = 39 sub-counties and 3,500 CHWs).

Mozambique: 6 districts were randomised into the technology arm and the control arm (total = 12 districts and 275 CHWs).

- After the interventions had been implemented, routine monitoring data was collected, uptake surveys conducted, and a series of observational surveys was carried out to better understand how well the components of the intervention were working (all aforementioned methods were collectively known as the 'process evaluation'). The process evaluation also involved key informant interviews with CHWs in the intervention arms of both countries (24 CHWs in each arm) as well as their supervisors (8 in each intervention arm). The project then used a method called 'most significant change' to monitor the perceptions of different stakeholders regarding the changes that had occurred as a result of iCCM and the interventions implemented.

- After one year (Uganda) and 18 months (Mozambique) of implementation, a large representative sample of CHWs and children in all arms were surveyed to ascertain primarily:

1. what proportion of children in each arm who had been recently sick with diarrhoea, pneumonia or fever (DPF) had received the correct treatment;
2. the costs of the care-seeking process; and
3. the levels of motivation and knowledge of CHWs in each arm.

We additionally collected economic data from a range of sources to inform the costs of implementing the interventions and to estimate their potential cost-effectiveness.

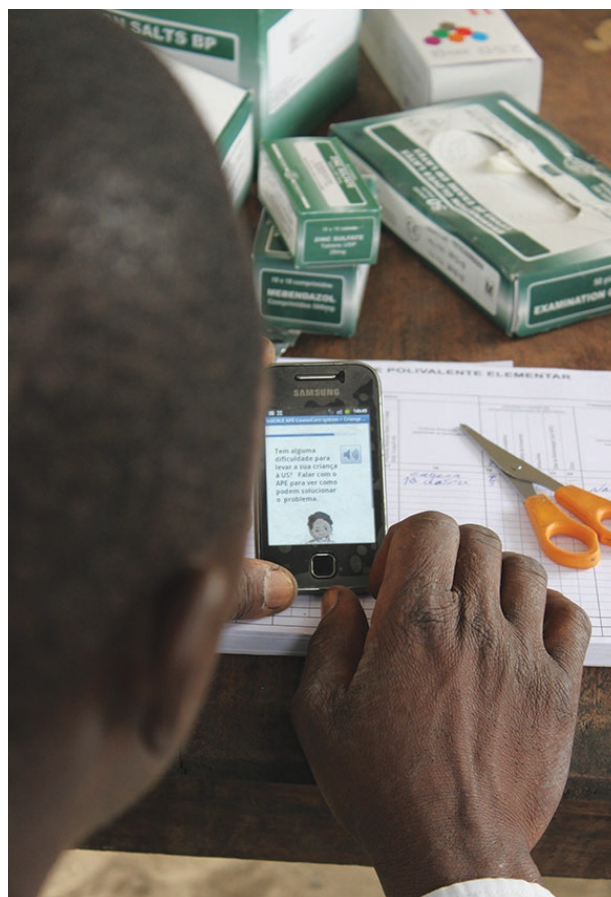
This study was approved by Makerere University Institutional Review Board in Uganda, the Uganda National Council of Science and Technology, the Comité Nacional de Bioética para a Saúde in Mozambique and London School of Hygiene & Tropical Medicine Ethics Committee in the UK. The trial is registered, ref. NCT01972321



## Findings

### Appropriate treatment

- Sick children in the technology arm were more likely to receive appropriate treatment for DPF compared with those in the control arm; this increase in coverage of appropriate treatment was significant in Uganda, although it did not reach significance in Mozambique (see Table 1). The largest effect on appropriate treatment was seen on diarrhoea (treatment with oral rehydration solution, ORS) in both Uganda and Mozambique, with a risk ratio of 1.39 (Confidence Interval, CI, 0.90-2.15) and 1.66 (CI 0.79-3.48), respectively.
- There was a suggestion of an effect in the community intervention arm in Uganda for appropriate treatment of DPF in children. As with the technology arms, the largest effect on appropriate treatment was seen on diarrhoea (treatment with ORS), with a significant risk ratio of 1.57 (CI 1.05-2.34). However, fewer children in this arm went to the CHW when ill, instead resorting to public health facilities.



A CHW uses the inSCALE technology intervention in Mozambique, called inSCALE APE CommCare application

Table 1: Appropriate treatment for diarrhoea, pneumonia and fever in the inSCALE intervention arms, as compared with the control arms, in Uganda and Mozambique

Country	Community vs. control Risk ratio (95% CI) for DPF	Technology vs. control Risk ratio (95% CI) for DPF
Uganda	1.08 (0.99-1.17)	1.09 (1.01-1.19)
Mozambique	-	1.17* (0.90-1.52)
Pooled effect of the technology intervention in both countries	-	1.10 (1.01-1.19)

Note: \*Adjusted for baseline levels of appropriate treatment: 34% (control) and 29% (technology).



*A Village Health Club meeting in Uganda, as part of the inSCALE community intervention*

### Care-seeking

- The inSCALE interventions did not necessarily improve access to iCCM CHWs. Care-seeking from CHWs did increase over time across all arms in Uganda, but less in the community arm, and not at all in Mozambique.
- The likelihood of appropriate treatment for DPF from CHWs was higher in the intervention arm than in the control arm in Mozambique. Furthermore, in Mozambique, appropriate treatment for those first visiting a public health facility was also non-significantly higher in the intervention arm. This may suggest CHWs have become more skilled as a result of the enhanced technology intervention that was implemented only in Mozambique, which featured a smartphone-based job aid with audio messages for caregivers. Consequently, CHWs here may have been better at conducting referrals to health facilities or caregivers had greater disease awareness as a result of the intervention and changed their health-seeking behaviour as a result.

### Motivation, performance and retention

- Motivation and performance did not change appreciably in the intervention arms. CHW motivation was notably high across intervention arms and country settings. The inSCALE interventions may have improved retention of CHWs, as a small, but significant, reduction in the attrition rate was observed in the intervention arms in Uganda. Furthermore, the process evaluations indicated that CHWs in the technology arms appreciated feedback on performance and those in the community arms greatly valued increased recognition by community members as a result of the Village Health Clubs.
- The process evaluation revealed that CHWs in Uganda are particularly vocal when advocating for their collective rights. The interventions were designed in part to stimulate a sense of collective identity under the theoretically driven assumption that a stronger sense of unity and collective social identity would lead to motivation to act in the





A CHW uses the inSCALE village health team mobile phone support system, as part of the technology intervention in Uganda, to submit aggregated patient information to a central server

group's perceived interests. Working conditions and especially the need for money for transport and some sort of financial compensation and associated recognition from MoH were commonly proposed. While these may be the most pressing issues for CHWs and not top of the agenda for programme planners, advocacy on behalf of the collective was nevertheless interpreted in the data analysis as indicative of raised levels of identification with the CHW collective.

- There was also a suggestion that CHWs identified more strongly with the CHW collective when drugs were available in Uganda. This result was non-significant and is to be explored further. It nevertheless emphasises the importance of drug supply and indeed providing CHWs with the work environment they were led to believe they would experience when they were trained. In addition, qualitative data from the process evaluation in Uganda indicated that CHWs felt drug stockouts adversely affected their status. This is likely to add to the negative impact of drug stockouts on CHW motivation. Although it was hoped that CHWs reporting on drug stock

levels in the technology arms would reduce stockouts, the process evaluation showed that data use for iCCM programme performance in the technology arms in both countries did not solve drug supply challenges.

#### Cost-effectiveness

- Preliminary cost-effectiveness results from Uganda show that the incremental cost per additional appropriately treated case is \$28 for the technology intervention compared with control and \$24 for the community intervention compared with control. Further analyses will explore scalability and the feasibility of using the appropriately treated case measure as a proxy for lives saved in order to model and estimate the cost per disability-adjusted life-year (DALY) averted.

## Conclusions

The inSCALE interventions resulted in a consistent, though not always significant, improvement in appropriate treatment for sick children with DPF. In particular, the combined effect of the technology intervention suggests appropriate treatment coverage could improve by 10 percent. The improvements observed in the intervention arms occurred despite problems with drug stocks and other contextual factors – suggesting that greater gains could be achieved if these issues were also targeted. The increases in appropriate treatment were not only at CHW level in the intervention arms but also at health facility level, which suggests there were alternative mechanisms responsible – perhaps in better referral from CHWs to the health facilities.

A focus on the relationship between CHW social identification and motivation has helped us understand the impact of drug supply on motivation. In addition, CHW motivation results were uniformly high, which suggests CHWs might in fact be motivated; we had assumed lesser performance stemmed from low motivation. While lesser performance of motivated workers may owe to events beyond their control (e.g. no drugs), qualitative results indicate CHWs are focused on improving their working conditions. This focus may detract from their ability to work effectively, while not adversely impacting their motivation. An already motivated workforce with little attrition suggests the key drivers of performance are likely to relate more to having the capability and opportunity to do the work (e.g. training, drugs, supervision) than to motivation.

Ultimately, the inSCALE results emphasise a key message from across the CHW literature – namely, that CHW strategies can be effective if they are supported appropriately:

*‘When CHWs are appropriately selected, trained, and supervised, and when they are provided with appropriate supplies, medicines, and equipment, CHWs can improve key health-related behaviours, extend the accessibility of key services, and strengthen linkages between communities and health services’<sup>[5]</sup>.*

## Recommendations

The inSCALE interventions have the potential to strengthen iCCM programmes, but at this time they could not overcome barriers such as drug stockouts. Nevertheless, the systems intrinsic to the inSCALE interventions have value beyond what they were designed for. The technology interventions offer health officials at district and national level the opportunity to obtain instant access to community-level data, and the ability to integrate this with national databases such as DHIS2. Closed user groups for free communication among supervisors and CHWs provide a means to overcome some of the difficulties associated with infrequent supervisor visits to CHWs. Furthermore, the smartphone-based job aid used in Mozambique provides an opportunity to regularly refresh CHW knowledge on patient diagnosis and treatment.

The popularity of the Village Health Clubs, which have continued and even spread despite no further project resources, is a testament to their appeal within communities. The clubs can be used as platforms for other community education and empowerment initiatives – either by the community themselves or for non-governmental and government initiatives. By linking the clubs to income-generating activities, the clubs could become self-sufficient.

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## Further reading

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