

A CHW in South Sudan counts a child's respiratory rate using coloured beads

# PROJECT BRIEF

## Improved tools for the measurement of respiratory rate and oxygen saturation for the detection of signs of pneumonia

The goal of the project is to identify the most accurate, acceptable, scalable and user-friendly respiratory rate timers and pulse oximeters for the detection of pneumonia symptoms in children by community health workers and frontline health facility workers in four low-income countries.

Pneumonia is one of the leading causes of death in children under five in both Southeast Asia and sub-Saharan Africa. Community health workers (CHWs) and frontline health facility workers (FLHFWs) diagnose pneumonia, primarily through counting the respiratory rate of children who have cough or difficulty breathing.

However, counting respiratory rates is often challenging, even for highly trained health workers, and misclassification is common. Pulse oximetry (POx) has been identified as a reliable and non-invasive tool to identify the levels of oxygen in children's blood. A low level of oxygen in the blood (hypoxemia) is a symptom of severe pneumonia and a strong predictor for pneumonia-related death. But suitable devices such as pulse oximeters are rarely available outside higher-level health facilities.

This project will evaluate the use of various respiratory rate timing and classification devices, as well as POx devices among CHWs and FLHFWs in Cambodia, Ethiopia, South Sudan and Uganda. These four countries have been selected due to the high proportion of under-five deaths caused by pneumonia.

### Country

*Cambodia*

*Ethiopia*

*South Sudan*

*Uganda*

### Donor

*Bill & Melinda Gates Foundation*

### Length of project

*November 2013–March 2016*

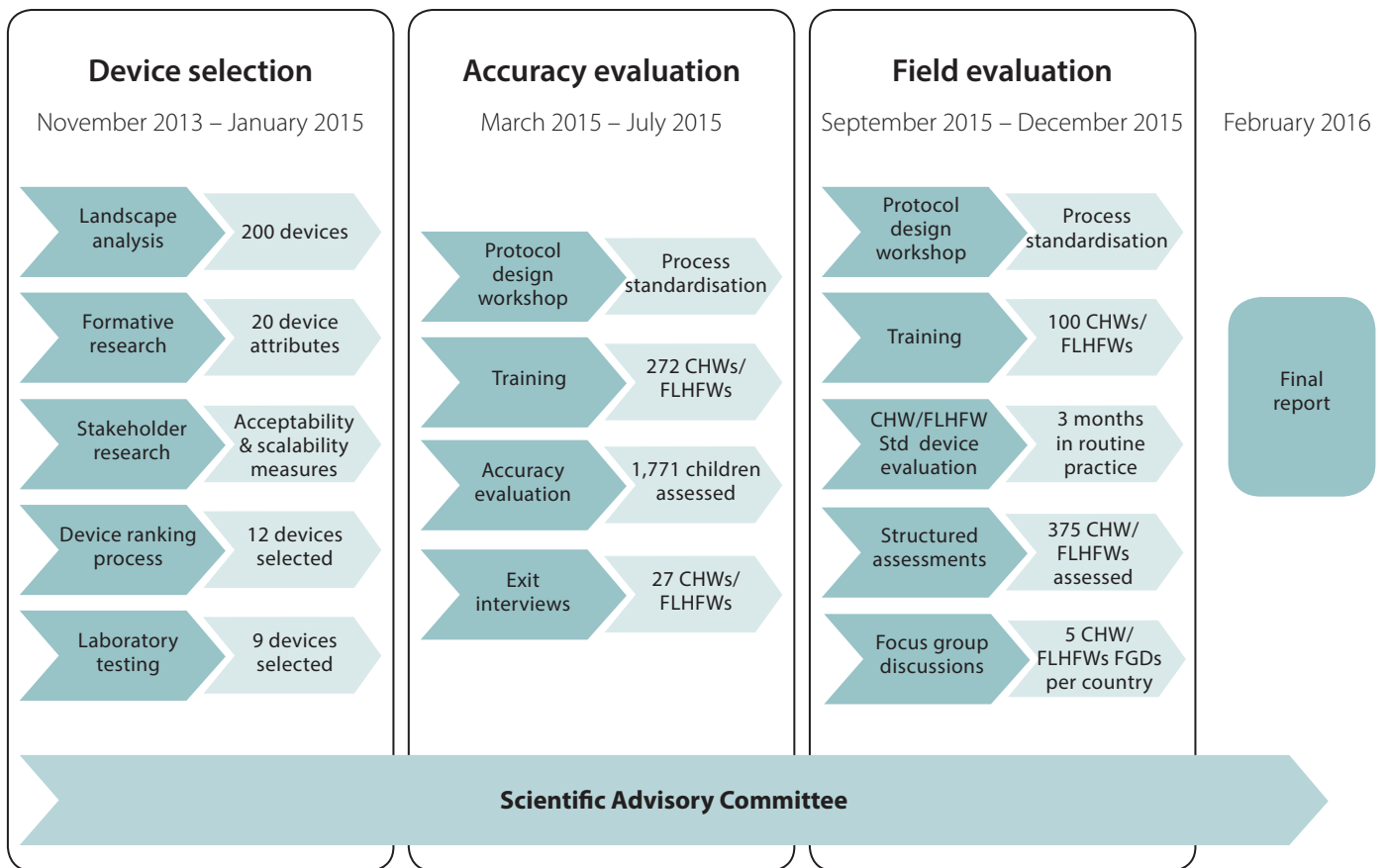
*26 months*

### Partners

*Ministries of Health*

*Scientific Advisory Committee*

# Pneumonia diagnostics project workflow



The project has three main phases spanning 26 months. It aims to:

- » Identify the most promising and appropriate devices for the detection of pneumonia in low-resource settings
- » Establish their accuracy in supporting the diagnosis of pneumonia symptoms or measuring oxygen levels in the blood when used by CHWs and FLHFWs
- » Explore their acceptability and usability as perceived by CHWs, FLHFWs and caregivers



A CHW in Cambodia uses a timer to measure the respiratory rate of a young child

## Findings to date

Results from formative research with CHWs in all four countries highlighted the following experiences:

- » A 'felt' need for tools to detect the signs of pneumonia was expressed by all CHWs
- » Barriers to pneumonia diagnosis included community level barriers such as parents' lack of patience or trust in CHWs and the CHWs own lack of sufficient knowledge and skills
- » CHWs highlighted issues with their current devices regarding suitability, usability and durability
- » Supply chain management issues were highlighted as a constraint to treating pneumonia at the community level
- » CHWs currently have no experience of using pulse oximetry to detect the signs of severe pneumonia
- » CHWs highlighted some ideal device characteristics such as automation, ease of use and accuracy in detecting the signs of pneumonia

For more information and for project developments, visit the pneumonia diagnostics project page:

[www.malariaconsortium.org/projects/pneumonia-diagnostics](http://www.malariaconsortium.org/projects/pneumonia-diagnostics)