



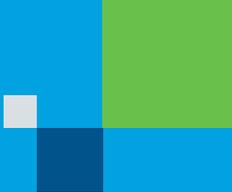
Evaluation of a Mobile Health Application in the iCCM Program in Malawi

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Principal Investigators: Simone Peart Boyce, ICF; Florence Nyangara, ICF; Humphreys Nsona, Malawi Ministry of Health; Emmanuel Chimbalanga, Save the Children Malawi



Evaluation Questions

- **Quality of Care.** Does the use of the D-Tree mobile application by HSAs improve the quality of care for children under five years of age, compared to children being classified and treated by HSAs who do not use this technology?
- **Data Quality Assessment.** How does the quality of data, as defined by availability, completeness, and consistency (a measure of accuracy), recorded by HSAs using the mobile application and submitted to the D-Tree database compare with the quality of data recorded by HSAs using paper registers and reported to facilities using paper forms?
- **Facilitators and Barriers to the Use of the Mobile Application.** What are the factors that facilitate or hinder implementation of the D-Tree mobile application that will affect its adoption and scale-up for iCCM programs in other districts in Malawi?

Methods – Quality of Care

Quasi-experimental study to evaluate the effect of the iCCM mobile application on HSA adherence to iCCM guidelines

- Observers (nurses with clinical training in child health and IMCI) used a case observation checklist to document HSA adherence to iCCM protocol.
- Evaluators (MOH iCCM trainers) simultaneously observed the sick child assessment using a re-examination form. (Gold Standard)
 - HSAs using the mobile application (intervention group, n=137)
 - HSAs using paper tools/protocol (control group, n=113).
- Key informant interviews (KII) were conducted to gather perceptions about quality of care when using the mobile app for iCCM.

Methods – Data Quality Assessment

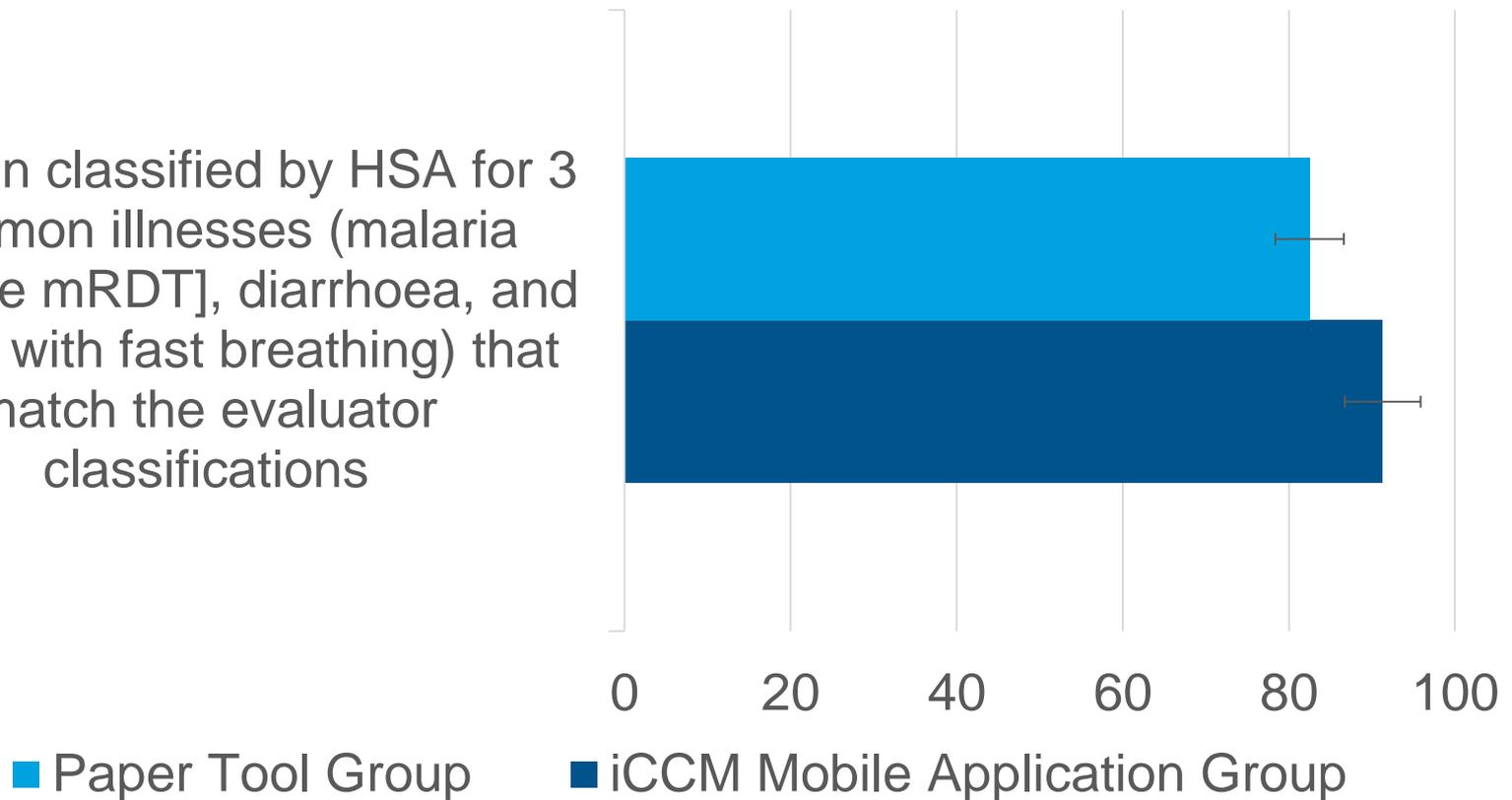
Quasi-experimental study design to assess three dimensions of data quality (availability, completeness, and consistency) of data collected by the mobile app and paper forms.

- HSAs who use both the mobile app and paper forms (n=159)
 - data collected via iCCM mobile app and submitted to the D-tree database
 - data collected via village clinic registers and submitted to health facilities on monthly reporting forms.
- Compared data for a two month period (June–July 2016)
- Key informant interviews (KII) were conducted to gather perceptions about data quality when using the mobile app for iCCM.

Probabilities of Correct Classification of Illnesses of Observed Sick Children Seen by HSAs

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Children classified by HSA for 3 common illnesses (malaria [positive mRDT], diarrhoea, and cough with fast breathing) that match the evaluator classifications



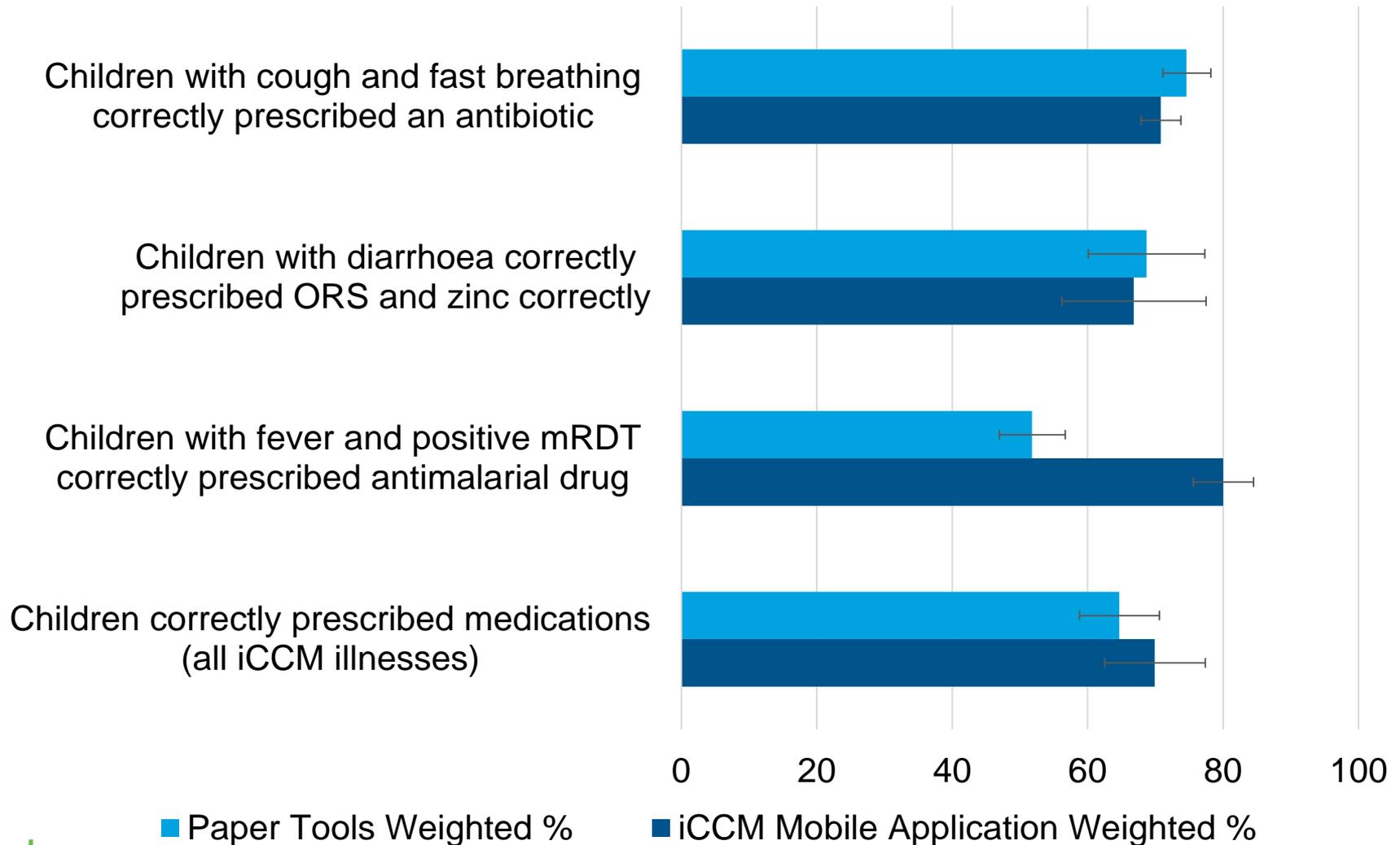
Probabilities of Correct Classification of Illnesses of Observed Sick Children Seen by HSAs

HSAs using the iCCM mobile application tended to classify sick children according to the iCCM protocol more often than HSAs in the comparison group

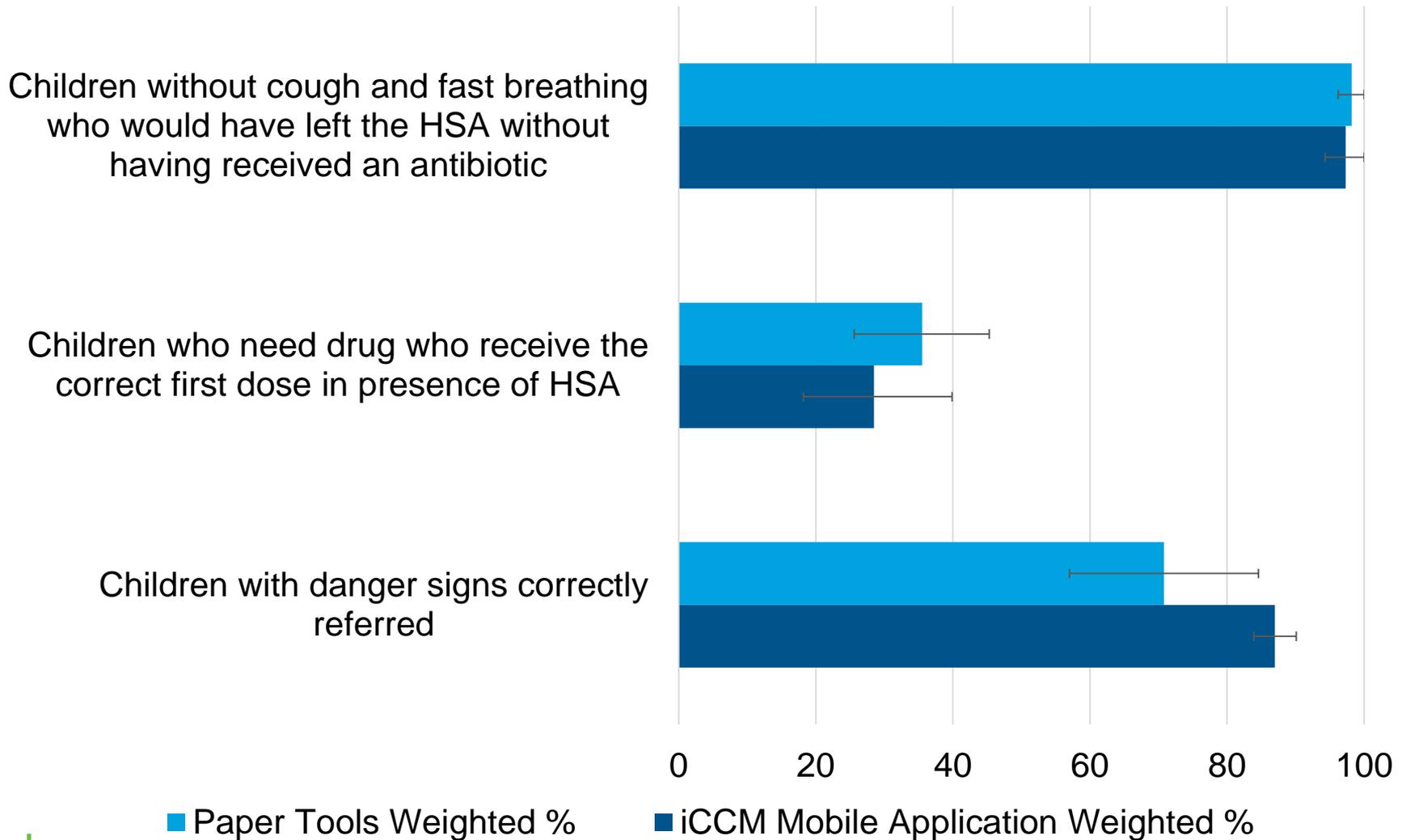
Classification	iCCM Mobile Application		Paper Tools		p-value
	Weighted (%)	(95% CI)	Weighted (%)	(95% CI)	
Children classified by HSA in the 3 common illnesses (malaria [positive mRDT], diarrhoea, and cough with fast breathing) that match the evaluator classifications	91.3	(87.6, 95.0)	82.5	(75.3, 89.8)	0.0252
Malaria (positive mRDT)^b	99.7	(99.1, 100.0)	99.9	(99.8, 100.0)	0.3924
Diarrhoea	95.7	(93.2, 98.2)	91.4	(86.3, 96.5)	0.0951
Cough with fast breathing	95.6	(92.9, 98.4)	89.2	(82.1, 96.2)	0.0550

^aClassifications include diarrhoea, fever, fast breathing, chest indrawing, convulsions, coma, unconsciousness, vomiting, everything, red eye, red eye with visual problems, sleepy or unconscious, palmar pallor, foot swelling, and color on the MUAC tape.
^bmRDT=rapid diagnostic test for malaria.

Probabilities of Correct Treatment and Referral of Children Seen by HSAs (1)



Probabilities of Correct Treatment and Referral of Children Seen by HSAs (2)



Summary Findings – Quality of Care

- HSAs using the mobile application correctly assessed and classified sick children at a higher rate than HSAs using paper tools, although no differences were found in treatment rates.
- The lack of effect on treatment rates points to additional support required regarding adherence to the treatment protocol before any full-scale implementation of the mobile application.

Key Findings – Facilitators for Use

- **Collaborative support.** Key informants described a collaborative process to roll-out the mobile application, led by D-Tree with input from MOH and Save the Children.
- **Recruiting Young HSAs.** Younger HSAs have an easier time adopting the mobile application.
- **Phone ownership.** Owning a good looking phone was motivation for HSAs to use it.
- **Opportunities to practice.** HSAs become proficient with the mobile application by practicing it.
- **Training and supervision.** Training and supervision frequently cited as a factor facilitating adoption of the mobile application.
- **Super-users.** Super-users are HSAs who receive extra training on how to troubleshoot basic issues with the mobile application. Each facility has one super-user.

The phone has motivated most of the HSAs using it. This is mainly because the phone has simplified their work...from sick child assessment to treatment... Reporting has (also) become easier, asking for drugs and other supplies from the health facility has also been simplified with the use of the mobile application.

District Key Informant, Ntcheu

Key Findings – Barriers for Use

- **Lack of national policy.** Rationale for adopting and scaling up the mobile application was well acknowledged, but observed a lack of national policy in place to support its implementation in Malawi.
- **Limited access to the D-Tree database.** Most key informants do not have access to data submitted to D-Tree from the mobile application.
- **Limited network coverage.** Network coverage is limited in some areas, which limits HSA ability to regularly sync their data.
- **Limited MOH capacity and resources in technology.** Responsibility and control of the mobile application is at D-Tree. The MOH has limited human capacity and other resources necessary to implement the technology.
- **Software problems; Hardware problems; Inadequate battery power; Insufficient airtime for data availability; Operator error**

*If D-Tree were to close shop today, MOH does not have the competence, resources, and understanding to run the show.
- National Key Informant.*

*It is easy for SHSA to catch HSA (errors) by looking at the consistence of a case and by following supervisory checklist (paper).
- SHSA, Rumphi*



Conclusions

- The mobile application may be a tool to facilitate shifting tasks to less-trained HSAs.
- HSAs using the mobile application correctly assessed and classified sick children at a higher rate than HSAs using paper tools.
- Lack of effect on treatment rates points to need for additional support on adherence to the treatment protocol.
- Favor use of village clinic registers and monthly summary forms to collect and report good quality data, compared to the mobile application.
- Need to examine broader contextual factors (i.e., network coverage, hardware/software wear and tear, airtime) that limit use of the mobile application.
- Unclear if resources are available to expand and sustain mobile application implementation nationally.
- Caregivers want improvements other improvements (i.e., construction of a village clinic and toilets, drug availability, and opening the clinic every day.)

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- Caregivers who endured long interviews and shared their perspectives.

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Thank You!

