



# PILOTING CSTACK IN SIAYA COUNTY: ENDLINE EVALUATION REPORT

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The project aimed at assessing whether implementing the cStock approach using mobile technology, user-friendly dashboards, and Information Mobilized for Performance Analysis and Continuous Transformation (IMPACT) teams leads to better availability of critical Integrated Community Case Management (iCCM) commodities in community-based health programs in Bondo and Ugunja Sub-Counties, Siaya County, Kenya.

This End line report has been prepared by JSI and does not necessarily reflect the views of the Saving Lives at Birth partners.

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Over two years of the cStock pilot project, remarkable achievements have been made in Siaya county towards strengthening the community health supply chain in order to ensure availability of adequate health commodities to the community health volunteers (CHVs).

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**ACRONYM LIST**

ACT	Artemisinin based Combination Treatment
AL	Artemether/lumefantrine
AIDs	Acquired Immune Deficiency Syndrome
CCM	Community Case Management
CHEW	Community Health Extension Worker
CHA	Community Health Assistant
CHS	Community Health Strategy
CHV	Community Health Volunteer
CU	Community Unit
CHMT	County Health Management Team
DHIS	District Health Information System
DFID	Department for International Development
DHS	Demographic Health Survey
HF	Health Facility
iCCM	Integrated Community Case Management
IMPACT	Information Mobilized for Performance Analysis and Continuous Transformation
JSI	John Snow Incorporated
KEMSA	Kenya Medical Supplies Agency
KII	Key Informative Interview
KOICA	Korea International Cooperation Agency
LIAT	Logistics Indicator Assessment Tool
LSAT	Logistics System Assessment Tool
MOH	Ministry of Health
ORS	Oral Rehydration Salts/Solutions
RDT	Rapid Diagnostic Test
SCHMT	Sub County Health Management Team
TB	Tuberculosis
USAID	United States Agency for International Development
WHO	World Health Organization

## EXECUTIVE SUMMARY

Community Health Strategy (CHS) presents a great opportunity to effectively utilize Community Health Volunteers (CHVs) to deliver an integrated package of community case management services (malaria, pneumonia, and diarrhoea) and other promotive health activities to children under 5 years. As community services are expanded to include maternal and newborn care, strengthening the community commodity supply chain has become critical to the success of these programs. JSI Research & Training Institute, Inc. (JSI) was awarded by Grand Challenges Canada under the Saving Lives at Birth Program a grant to replicate the cStock approach in two sub-counties in Siaya County to support the community case management initiative. The cStock approach uses mobile technology, user-friendly dashboards, and IMPACT teams to reduce stock outs of critical commodities in community-based health programs.

A baseline assessment was conducted before commencement of the project in 2017 to collect quantitative and qualitative data on the status of the supply chain system for iCCM and other selected health products and also to provide a verifiable platform against which impact of supply chain interventions in improving product availability at the community level can be objectively assessed and measured. Based on the baseline results and lessons learnt from Malawi where cStock was initially implemented, a deliberate effort was made to design a simple tool that is feasible and acceptable to CHVs and provides real-time, actionable CHV supply chain data for supervisors, store managers, and stakeholders to resupply, coordinate, plan, and identify solutions to ensure lifesaving commodities are available to CHVs at all times. The cStock pilot project was rolled out in the two implementation sites (Ugunja and Bondo Sub-Counties) from July 2017 to November 2018. A mid-term assessment was conducted in July 2018 and thereafter an end line assessment was conducted in November 2018. A mixed-methods evaluation, consisting of quantitative surveys and longitudinal trend analysis from system outputs was used during the end line assessment. All health facilities in Ugunja and Bondo sub counties with a functional CU were sampled. At each health facility all Community Health Assistants (CHAs) and Health Facility drug store incharges were included in the assessment. In addition, three CHVs in community units (CUs) linked to each of the health facility were randomly selected. Quantitative data was collected using CTO Survey, a data collection technique using mobile phones. Analysis of quantitative data was conducted using Excel and Stata while qualitative data was analyzed by themes. Data on trainings, supervision, existing meetings, reporting and resupply, transport, communication, storage and management of health commodities, stock status in addition to other data on supply chain was collected.

The assessment found out that there was a significant increase in the number of CHVs trained in health commodity management from baseline to end line ( $p < 0.01$ ). All CHVs interviewed were trained on cStock. 85% of CHVs and 89% of CHAs were able to show the data collector the application on their phone. At end line 82% of CHVs reported using the inventory card to report on commodities. This is a new tool that was introduced as part of the cStock approach. Forms used for requesting commodities became more standardized and the use of improvised forms reduced due to the implementation approach that focused on all aspects of reporting and resupply not just the technology. There was a 14% decrease in the number of CHVs who cited complexity of



completing the forms as a challenge. The overall reporting has been sustained above 80% from June 2018 when the IMPACT Team meetings were implemented in most of the community units. 100% of CHAs reported using logistics data to inform resupply quantities given to CHVs and to follow up on stock outs. 94% of the CHVs find it easy to use the cStock platform. 100% of CHVs and CHAs reported that they would like cStock to continue. Reduced workload was noted as the greatest benefits of using cStock by CHVs (89%) and CHAs (72%). 99% of CHVs interviewed reported attending an IMPACT team meeting, 88% of CHVs reported to have attended IMPACT team meetings last or previous month. Stock out is a chronic problem in the county, and this was reported to be affecting the effectiveness of the community health program and there is therefore an urgent need to address this challenge.

A list of recommendations were made including: adopting the reporting tools that were introduced during the project implementation phase, clearly defining which reports the CHVs should submit to the CHA every end of the month, simplifying the emergency ordering process to ensure that CHVs can easily place an emergency order using cStock and that the CHA is able to swiftly process the emergency order and ensuring IMPACT team meetings are consistent and the proposed process (review of performance, root cause analysis, action planning and recognition) is followed. Increasing commitment from all levels to allocate sufficient supplies for the community health program at all times will ensure effectiveness of the cStock approach. Despite the chronic stock out of iCCM commodities, the project demonstrated that implementing the cStock approach – using mobile technology, user-friendly dashboards and IMPACT teams; can result in improved availability of critical iCCM commodities in community-based health programs in Bondo and Ugunja.

## **1.0 BACKGROUND**

Community-based health workers are critical to achieving universal health coverage, as they play a critical role in reaching underserved communities with preventive, promotive and curative services related to reproductive, maternal, newborn and child health, infectious diseases, and non-communicable diseases. The under-five mortality rate in Kenya was 84.7 per 1000 live births in 2010. There are disparities across regions, ranging from 60 per 1000 live births in Nairobi to 101 per 1000 live births in Nyanza Province. Siaya County in the former Nyanza Province has significantly high maternal, neonatal, and child morbidity and mortality due to HIV/AIDS, tuberculosis (TB), malaria, and other communicable diseases; poor sanitation with low latrine coverage; and poor nutrition (DHS Kenya, 2014). To address these health challenges, Kenya's current Community Health Strategy presents a great opportunity to effectively utilize Community Health Volunteers (CHVs) to deliver an integrated package of community case management services (malaria, pneumonia, and diarrhoea) and other promotive health activities to children under 5 years through the iCCM strategy (MOH, 2006). As community services are expanded to include maternal and newborn care, strengthening the community commodity supply chain has become critical to the success of these programs.

JSI received a grant from the Saving Lives at Birth Program partners through Grand Challenges Canada to implement the cStock pilot project. The Saving Lives at Birth Partners include USAID, the Government of Norway, the Bill & Melinda Gates Foundation, DFID, and KOICA. The program sought groundbreaking prevention and treatment approaches for poor, hard-to-reach communities including innovative ideas that leapfrog conventional approaches in technology, service delivery, and “demand side” innovation. JSI sought to replicate the cStock approach in Kenya to support the community case management initiative. The cStock approach uses mobile technology, user-friendly dashboards, and quality improvement teams to reduce stock outs of critical commodities in community-based health programs. JSI has been implementing this project for 18 month covering all functional Community Units (CUs) in Ugunja and Bondo Sub-Counties of Siaya County.

A baseline assessment conducted in the first year of the project (2017) identified key gaps in the community health supply chain and the project used these findings to design the cStock approach which has three critical components: mhealth technology, user friendly dashboard and IMPACT teams.

In July 2018, a midline evaluation was conducted to assess the perspective of the project stakeholders, specifically the CHVs, CHAs and health facility incharges (HFICs) and other staff on the feasibility, acceptability, and effectiveness of the cStock approach. Qualitative data was collected through key informant interviews (KII) and focused group discussions (FGDs).

Key findings from the midline evaluation were:

- cStock application introduction was in an inclusive and participatory manner by JSI. The entry process into the county was consultative and the county and MOH team felt included in the implementation and own the process since the project is embedded on existing MOH structures.

- The cStock facilitators were good, patient with trainees, and shared helpful and relevant job aids and reference materials. Training duration was generally good except for CHVs that was reported to be short.
- cStock is easy to learn and use. It is a friendly mobile application and according to a group of CHAs, 90-95% of the CHVs are comfortable using the app. The IMPACT teams are proving to be useful as acknowledged by most stakeholders,
- The cStock intervention has been accepted and consistently being used by most of the stakeholders over the last five months after the training.

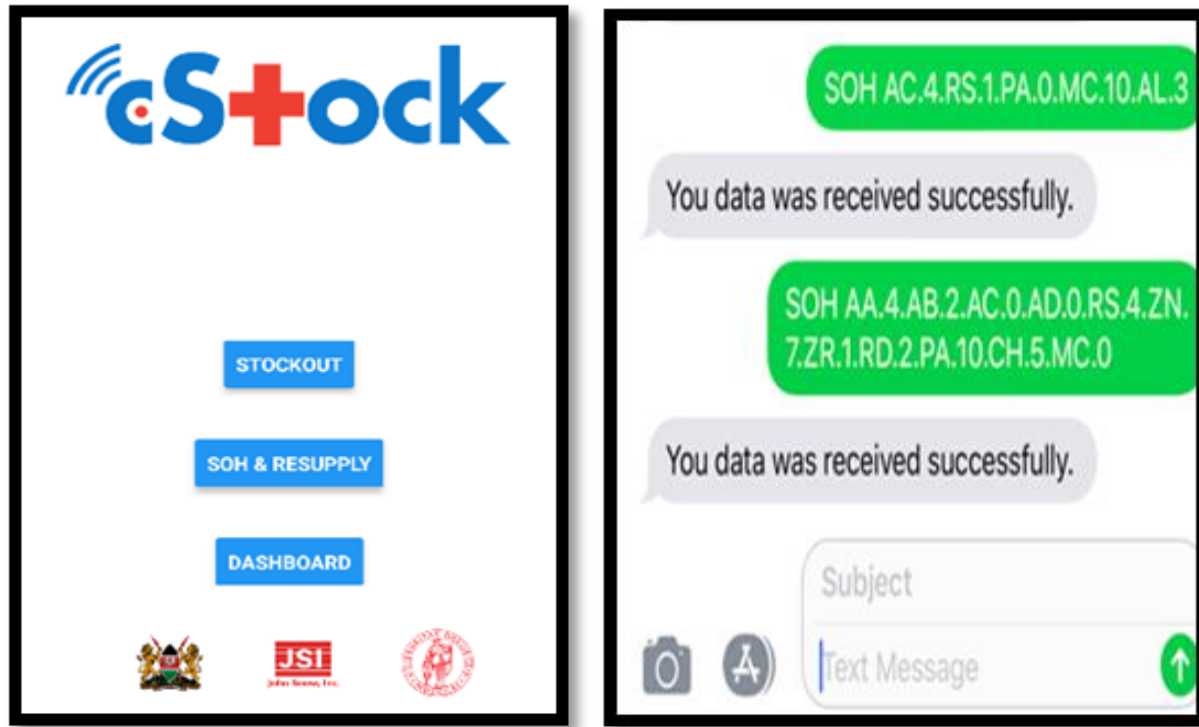
Despite the short implementation period after the mid line assessment, efforts were made to implement some of the recommendations made during the midline assessment. The end line evaluation was conducted in November 2018 to assess the project goals had been achieved and the status of institutionalization of the cStock approach.

## 1.1 Description of the cStock approach

A deliberate effort was made to design a simple tool that is feasible and acceptable to CHVs and provides real-time, actionable CHV supply chain data for supervisors, store managers, and stakeholders to resupply, coordinate, plan, and identify solutions to ensure lifesaving commodities are available to CHVs at all times. In addition, there was need to have a solution that can be scalable to other counties and that is likely to be sustainable.

The project undertook a comprehensive supply chain design process. This process informed the workflows for routine reporting and resupply and emergency reporting in DHIS2. In addition, the design included redesigning paper based recording forms, collection and resupply processes, defining roles and responsibilities and IMPACT teams. The result was a comprehensive package of standard supply chain procedures for CHVs combining **mobile technology, user-friendly dashboards** and **IMPACT Teams** each with unique attributes:

**Mobile Technology:** From the baseline assessment, it was established that the CHVs and CHAs use different phones; feature phone, smart phone and tablets. To respond to their needs, the cStock platform was designed to interact with whatever technology is available to them - feature or smart phone, computers, tablets (figure1). cStock links stock reporting to resupply. With cStock, stock data (Quantity dispensed, Stock on Hand-SOH and Quantity received) reported by CHVs triggers messages to their supervisors to ask them to take actions to resupply or address emergency orders. The system uses logistics data that can be captured offline and submitted when there is internet access. Collaboration with the local internet provider (Safaricom) allowed users to send their reports even if they did not have internet bundles. The provider monitors the traffic to the platform and bills JSI. This significantly lowered the internet cost associated with the platform. Using a structured short message (SMS), users using a feature phone or with no internet access are able to submit their logistics data at no cost. The Short code message provider bills JSI as well. Data sent via SMS is integrated with data sent via the App and all data is available in the DHIS2 platform. DHIS2 was selected as the right solution as it is open source, used in over 60 countries and many community health programs are opting to use DHIS2 for collecting other community health data.



App Version of cStock platform

SMS version of cStock platform

Figure 1: cStock Application and SMS version

**User-friendly Dashboards:** Data reported by the CHVs and the CHAs are converted into relevant, aggregated, and timely information to measure the performance of the supply chain. The dashboards are user centered to allow decision making at the community, facility, Sub County and county level (figure 2). The dashboard displays the data in easy-to-read graphs and charts which can be accessible via the phone or laptops providing the user with a choice of different visuals for the same indicators to help in decision making. Key indicators in assessing the performance of the supply chain are monitored on a monthly basis. These include; reporting rates, stock status, stock out, reporting and processing of emergency orders and consumption rates. Indicators assessing the quality of the data were also included.

**IMPACT Teams:** IMPACT Teams provide a structured approach for using data and create a culture of joint problem solving. The IMPACT teams were established at various levels; facility and Sub County. At the facility level, the team is composed of the CHVs attached to the community unit(s), their supervisor (CHA) and the drug store incharge/facility incharge of the link facility. The sub county IMPACT team is composed of key members of the sub county health management team. The teams were trained to develop, interpret and set targets for key supply chain indicators, use action oriented dashboards and encouraged to follow a structured, problem-solving process using their data for operational and strategic decisions with ultimate goal of improving the performance of their supply chain. The IMPACT Teams has a number of core responsibilities that



are expected to be carried out regularly with the aim of achieving the common goal of ensuring availability of products at the community level. Most of these responsibilities are performed during the IMPACT team meetings that are supposed to happen on monthly basis. The IMPACT Teams meet on monthly basis with no facilitation from the JSI. For the community IMPACT teams, the meeting were scheduled to happen when the CHVs go to the link facility for resupply. This was to ensure that there is no additional cost incurred to hold the meetings. Performance of the key indicators (reporting rates, stock status, stock out etc.) are discussed during the meetings. Good performances are recognized as per the recognition plans developed during the trainings. Deliberations during the meetings are captured in minutes and action plans developed.

Issues that cannot be resolved at the community IMPACT team level are escalated to the sub county IMPACT team meeting. This forms a linkage between the two levels of the IMPACT teams. Selected county health management members attend the sub county IMPACT team meetings to get updates.

The IMPACT Teams were expected to result in increased collaboration and harmony between the CHVs, CHAs, and health facility incharges in addressing issues facing the community health supply chain. (figure 3).



*Figure 3: CHA and Health facility incharge facilitating an community IMPACT Team meeting*

Figure 4 illustrates the cStock components and linkages

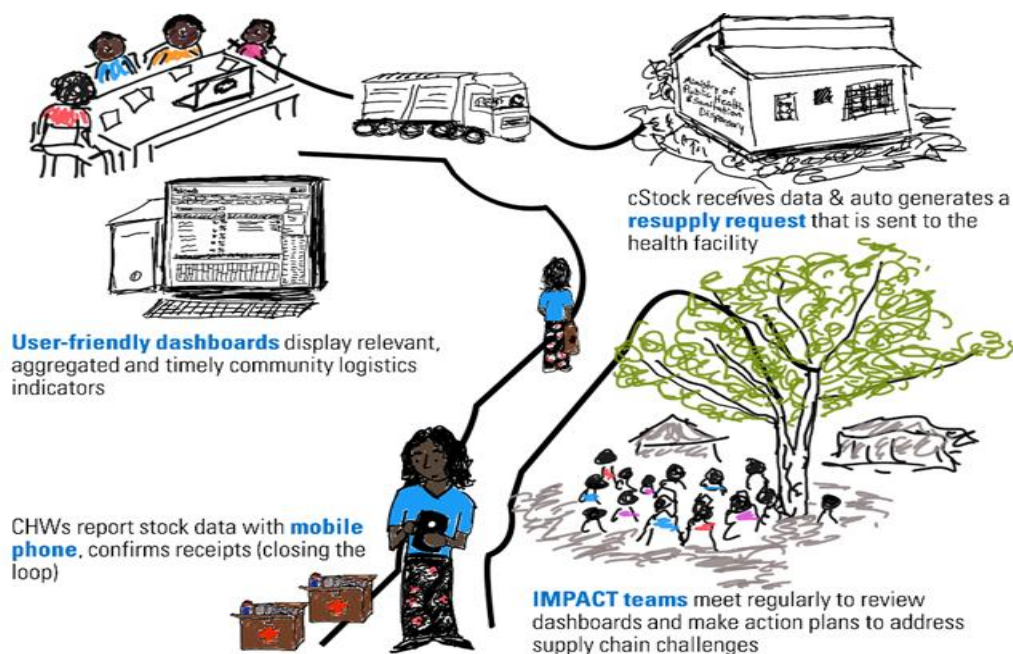


Figure 4: cStock approach components and linkages

## 1.2 Other design considerations

The design process saw the introduction of tools for the CHVs and CHAs to complement the cStock approach. A CHV inventory card was introduced for the CHVs to help in commodity management. The inventory card is different from the conventional stock card since one inventory card is used to capture information for all the commodities the CHV manages. CHVs were trained on how to use the inventory card including how to conduct a physical count. In addition to the CHV inventory card, the CHVs were trained on how to update the Treatment and Tracking register that captures data on the amount of commodities dispensed to the households. The treatment and tracking register dispensed data inputs in the CHV inventory card which in turn provides the data (dispensed, SOH and receipt) reported via cStock platform. The CHVs submit a copy of the inventory card and treatment and tracking register every month to the CHA for review in order to ensure data quality.

At the CHA level, a resupply worksheet was introduced to help the CHAs document the amount of commodities received from the link facility and amount resupplied to each of the CHV they supervise.

Job aids and standard operating procedures (SOPs) on how to use cStock were supplied to the users as well as performance plans and recognition plans. These have acted as important reference materials during implementation of the approach.

### **I.3 Roll out of the intervention**

Following deployment and user testing of the cStock platform, plans for roll out were instituted. A training methodology was selected to ensure efficiency while building capacity and creating champions as close to the CHVs level as possible for sustainability and ongoing skills development. A cascaded training strategy incorporating use of blended learning was designed to meet the set objectives. Training materials were developed to suit literacy and numeracy levels of the CHVs, who are the primary cStock platform end users. Both the training materials and SOPs were visual with illustrations and pictorials to facilitate their use in a self-directed way.

Twenty CHAs and six members of the sub county health management team were selected by Siaya County MOH leadership for the training of trainers (TOTs). The TOT facilitators conducted a four-day experiential, hands-on training utilizing adult learning principles. During the first two days of the training, the sessions were modelled around demonstrations, peer-to-peer discussions, lectures, and practice on use of the cStock platform among other learning approaches. This ensured the blended learning closely replicates on-the-job learning, through experience and interaction with co-workers. This was followed by teach back sessions where the participants received constructive feedback on their training performance. The TOT concluded with a competency evaluation for each participant and development of a plan for cascading the training to the CHVs in the various community units. Two TOTs were paired based on their strengths. The pair was mandated to organize, conduct, and manage a two-day training for each community unit. To ensure maximum experience and interaction between trainer and trainee, trainers were to limit the number of CHVs per class to 16 participants. The training approach deliberately planned for community unit trainings to be held in local community settings such as churches, community halls, chief's camps, and schools to minimize training costs and ensure sustainability. Each team was supervised to ensure quality of the trainings.

## **2.0 ENDLINE EVALUATION METHODOLOGY**

The overall study approach is a mixed-methods evaluation, consisting of baseline, midline and end line quantitative and qualitative surveys and longitudinal trend analysis from system outputs. Both Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs) were used to collect qualitative data while quantitative data was mainly collected through surveys of sampled CHVs. An evaluation framework previously developed by the global mHealth community, led by the World Health Organization (WHO), to ensure a comprehensive assessment of an mHealth tool and its effect on the system assessed was used. The framework identifies key domain areas as important measures for predicting the likelihood of long-term effectiveness, scalability and ownership of an intervention (Figure 5). The evaluation framework builds on best practices for evaluation of mHealth initiatives.



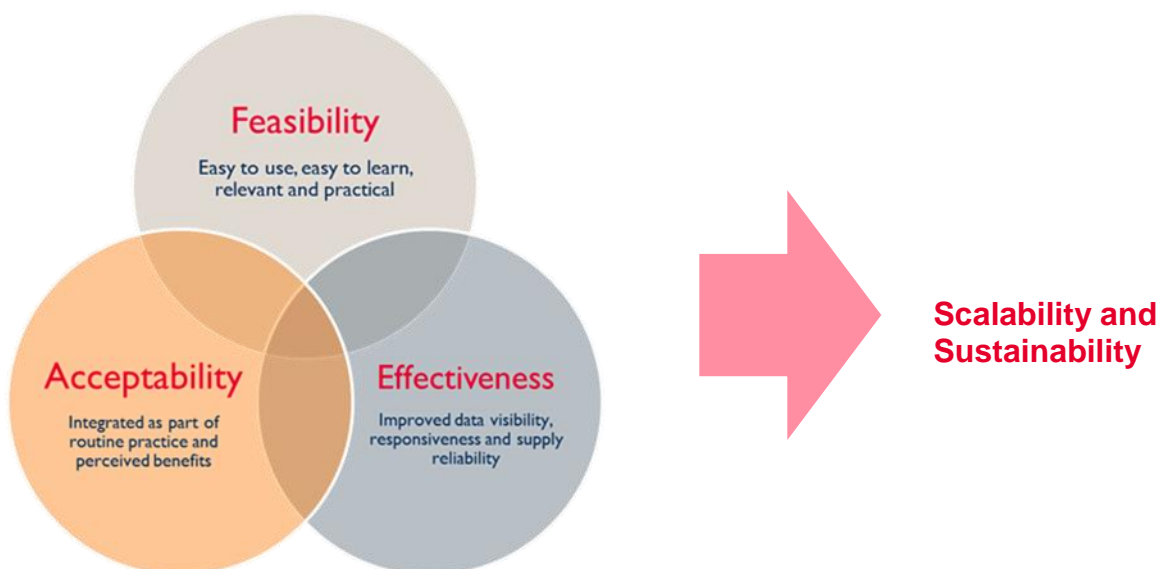


Figure 5: Evaluation framework

In this framework, a **feasible** intervention is one that seeks to address a defined problem and that provides a viable solution or platform for solving the problems within existing health system structures and staff capacities in a country. The solution should be easy to use, easy to learn and with few or no difficulties experienced by the user. For this evaluation, the measures of feasibility were:

- Improved reporting rates
- CHVs, CHEWs/CHAs and HFs have the necessary skills and ability to use cStock

An **acceptable** intervention is one that users perceive as valid, reliable, and beneficial; users are satisfied that the intervention meets their needs by helping them adequately solve a problem or make improvements in their daily work. Acceptability is achieved when the majority of users use the intervention on a regular basis for supporting routine tasks. For this evaluation, the measures of acceptability were:

- cStock will become the primary means for CHVs to order or request health products from their resupply point.
- cStock will become the primary tool for CHAs and HF staff to use for resupplying CHVs, and
- Teams use data from cStock to measure, monitor, and improve supply chain performance

An **effective** intervention is one that achieves the intended or desired outcome. In this study the desired outcomes across the two sub counties are improvements in data visibility, responsiveness and supply reliability. For this evaluation effectiveness was measured and compared from baseline to end line as:

- Improved data visibility measured as improved reporting rates, timely reporting and complete reporting rates,
- Improved responsiveness measured as improved lead times, and
- Improved supply reliability measured as reductions in stock out rates.

Quantitative survey was used for baseline (September 2017) and end line evaluation (November 2018) although the purpose was slightly different for both surveys. The purpose of the baseline

assessment was to collect data on the status of the supply chain system for iCCM and other selected health products while the purpose of the end line assessment was to assess whether implementing the cStock approach has led to better availability of critical iCCM commodities in community-based health programs in Bondo and Ugunja Sub-Counties. Key informant interviews and focused group discussions were used in midline evaluation (July 2018) to understand the perspective of the project stakeholders, specifically the CHVs, CHAs and HFICs and other staff on the feasibility, acceptability, and effectiveness of the cStock intervention as well as assess progress and challenges with implementation and inform refinements to the intervention.

## **2.1 Data collection tools**

To enable collection of quantitative and qualitative data, the following tools were used: 1) the Logistics System Assessment Tool (LSAT); 2) the Logistics Indicator Assessment Tool (LIAT); and 3) Key Informant Interviews (KII) guide.

The Logistic Indicators Assessment Tool (LIAT) is a validated tool for assessing stock status and other quantifiable aspects of a supply chain (JSI, 2011). A modified version of LIAT that focuses on community level supply chain issues was used to capture primarily quantitative data. Data collection using LIAT included physically counting the amount of key iCCM products kept at each level of the system (CHVs and Health Facility), storage conditions, and certain aspect of record keeping and reporting.

## **2.2 Sampling**

All health facilities in Ugunja and Bondo Sub counties with a functional CU were sampled. At each health facility all Community Health Assistants (CHAs) and Health Facility drug store incharges were included in the assessment. In the few cases where there was more than one CHA per facility, only one CHA was interviewed, mostly the community CHA. For CHVs, a sample size was estimated to detect a twenty percentage-points decrease in stock out rate for CHVs from 60% at baseline to 40% during the follow-up surveys with 80% power and 5% two-sided alpha-error. Accordingly, an independent sample of 111 CHVs (allowing for a 10% oversample) was targeted for baseline and end line. Three CHVs per health facility were randomly selected. Where the selected CHV was not available, replacement was done by randomly selecting another CHV from the list provided which contained the details of CHVs per facility. Table 1 summarizes the sampling framework.

Table 1: Sample Size

	<b>SUB-COUNTY LEVEL</b>				
	<b>Assessment</b>	<b>Sub-County Health Office</b>	<b>Health Facilities</b>	<b>CHAs</b>	<b>CHVs</b>
<b>Target</b>		<b>4</b>	<b>37</b>	<b>37</b>	<b>111</b>
<b>Achieved</b>	Baseline	4	34	33	107
	End line	4	37	36	112
<b>County Level KIs</b>					
<b>County pharmacist - 1</b>					
<b>Community Health Focal Person – 1</b>					
<b>Sub-County Level KIs</b>					
<b>Sub-County Pharmacist - 2</b>					
Sub-County Community Health Focal Person – 2					

### 2.3 Use of smart phones for data collection

The project used CTO Survey software, which is a free software package that facilitates transfer of interview forms onto smart phones for data collection and enables transmission of the data from phones direct to the internet via the web. Samsung phones were used. Prior to implementing the survey, the project trained data collectors for five days on CTO Survey software navigation, form navigation and on basic logistics competencies needed to collect credible data. The forms and the use of the phone were also field tested for 1 day in Gem sub county which was a non-study site for baseline and selected facilities in Bondo for end line assessment. Minor bottlenecks observed were accordingly rectified prior to commencement of actual data collection.

Following validation of the data collection forms, forms were loaded onto the smart phones. Any changes to the instrument was made based on learnings from field testing. Paper translations for CHV survey tools in local Dholuo language was provided. Use of CTO survey allowed immediate transmission of the data collected to a web-based server, which bypassed the need to manually enter data into a separate database and allowed preliminary review of data collected in real time to aid trouble-shooting throughout the data collection period. CTO survey also allowed data to be collected offline on the mobile phone and later synchronized on the server when online.

Data quality check measures to prevent data duplication, missing data and basic checks for illogical entries was employed. Completed data was checked by team supervisor at the end of each interview before leaving the facility. The completed form was then uploaded to the mobile data collection server when team accessed connectivity and data collection checks was made daily throughout the data collection period by the team in Nairobi so that data quality issues could be resolved quickly.

## **2.4 Enumerator Recruitment and Training**

Recruitment of Research assistants (RAs) and their supervisors were done for residents of Siaya County who met minimum qualifications. The team had a minimum college level of education and had prior data collection experience. Once recruited, they were invited for a five-day intensive training. The training started by introducing the participants to the cStock project, the community health program supply chain system in the country and standard data monitoring forms. Thereafter, participants were taught about survey methodology, interview techniques, random selection of CHVs, and use of smart phones for data collection. The training had a 1 day pilot phase where both the questionnaires and the use of smart phone for data collection and transmission to a central server were field tested. The questionnaires were then appropriately modified post pilot test to incorporate all necessary changes. JSI, Siaya county health management team representatives and CHDU personnel facilitated the training of enumerators.

## **2.5 Data Management and Analysis**

Data collection commenced on 2<sup>nd</sup> October and was completed on 4th November 2017 for baseline and between 5<sup>th</sup> and 23<sup>rd</sup> November 2018 for end line assessment. Data collectors sent electronic survey records directly from smart phones to the web-based CTO Survey database, and cStock staff received and processed them. The cStock staff inventoried and cleaned records throughout the data collection period and after completion of data collection, until all expected records were received. The format of records received allowed for easy transferring of data to Excel. However, additional steps were required to format records for analysis in other packages such as SPSS and STATA. Analysis of this quantitative data was conducted using Excel and Stata. Significance was tested at 0.05%.

Qualitative data from key informant interviews was analysed by themes. The responses were grouped according to the similarities in responses since majority of the questions were open-ended. Emerging themes were summarized.

## **2.6 Review of cStock dashboard**

Performance in various process indicators was established by review of the cStock dashboard. The implementation period considered was from March 2018 to November 2018. Trends were

identified where possible as well of calculation of percentage change from baseline to end line for some indicators. The sub county dashboard was the primary focus as it provides aggregated data and allows easier comparison of performance between the two sub counties.

### **3.0 LIMITATIONS**

The study period was characterized by an ongoing nurse strike throughout the data collection period at baseline. Many of the facility drug stores are managed by nurses and as a result it was difficult to access some facility stores; there were two in particular that were not possible to access.

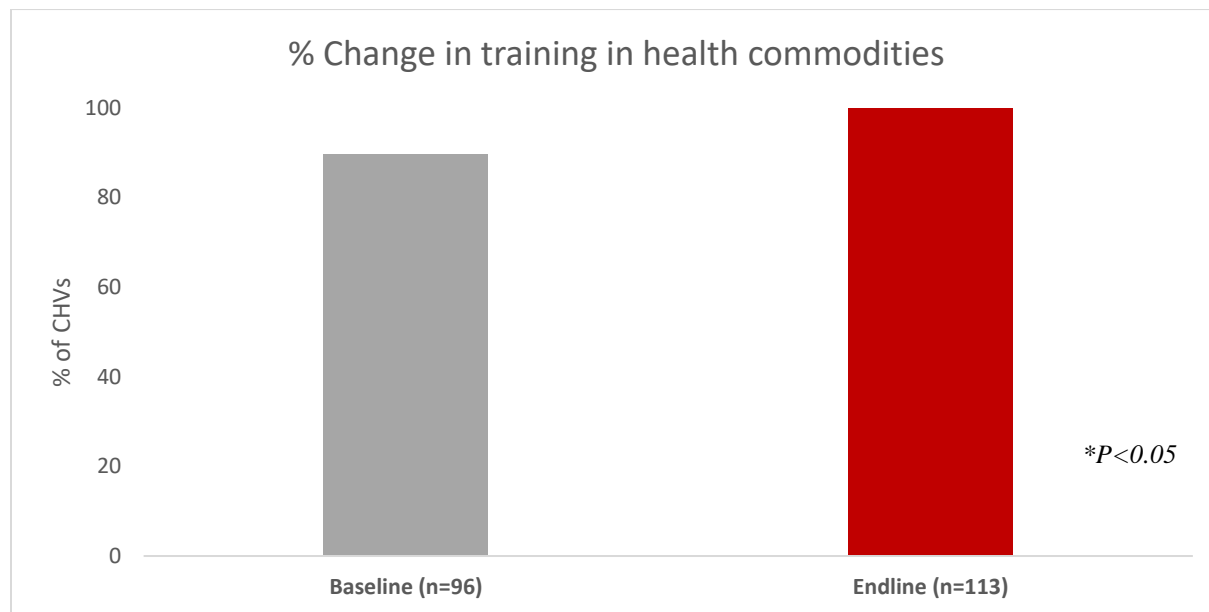
About 30% of CHVs among those originally sampled were replaced in baseline and 10% in end line assessment. Replacements were only done after three successive appointments were not honored. The most common reasons for replacement included cases where CHVs had withdrawn their services, changed their phone contacts, or travelled. The replacement rate improved during endline since some CHAs supported the research assistants to physically go to homes of CHVs who could not be contacted over their phone. Replacement was done randomly. Some of the CHAs were not interviewed at their work places hence they did not have most of the records that they were required to show the data collectors. Majority of the CHVs at end line had not updated their commodity management records since they were stocked out hence it was not possible to get enough data to determine the stock status of the commodities in their possession.

### **4.0 SUMMARY OF FINDINGS**

This assessment was designed to verify whether implementing the cStock approach has led to better availability of critical iCCM commodities in community-based health programs in Bondo and Ugunja Sub counties. A comparison of baseline and end line results was done to show if there was any significant change in the various category of the results. The findings are drawn from the end line assessment as well as a review of cStock dashboard for the indicators monitored on a monthly basis. Qualitative results from midterm assessment have also been included where possible. The various categories include: training, supervision, resupply, reporting, cStock, transport, storage, communication, IMPACT Teams and stock status among others. Discussion of the results based on the three evaluation domains is done at the end of the results section.

#### **4.1 Training**

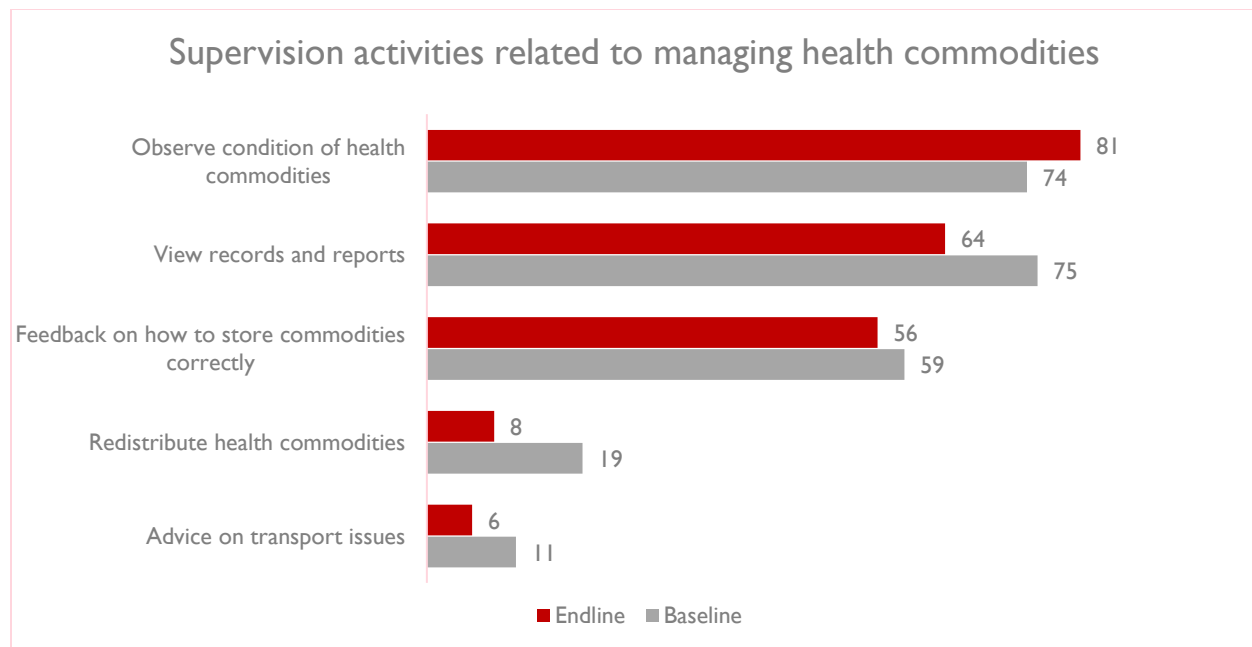
Knowledge and capacity of health workers is important for the system to function efficiently. Training CHVs in supply chain ensures proper commodity management which is a prerequisite for safe and effective case management. There was a significant increase in the number of CHVs trained in health commodity management from baseline to end line as shown in Figure 6. Majority (71%) of the CHVs reported having received the training in the last one year. Some of the topics covered during the training included storage, record keeping, reporting, monitoring of expiry dates and dispensing of commodities.



**Figure 6: Percentage of CHVs trained in Supply Chain Topics**

## 4.2 Supervision

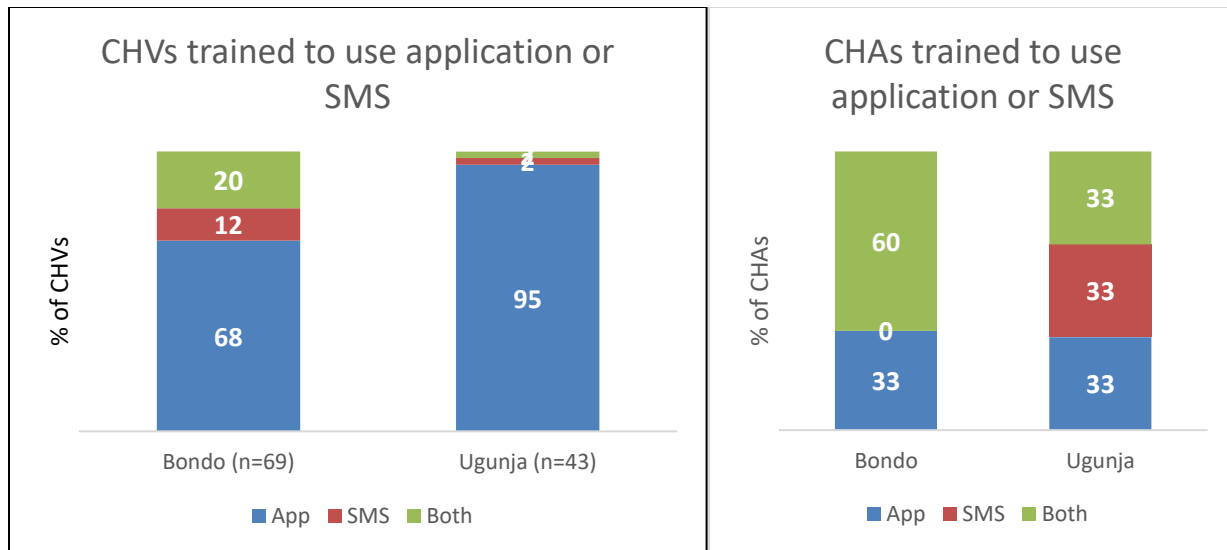
Supervision is a critical component of any system. It supports staff to improve their work performance continuously and encourages open, two-way communication, and building team approaches that facilitate problem-solving. Regular supervision requires frequent follow-up with staff to ensure that tasks are being implemented correctly. Supervision was part of the implementation of the cStock approach which included use of the performance review of cStock dashboard to plan supportive supervision for suboptimal performing community units. Despite there being no significant change in the percentage of CHVs who received supportive supervision from the CHAs ( $p=0.8$ ) or the sub county teams ( $p=0.9$ ) from baseline to end line, there was a major focus on discussion of commodity management issues (93%) for those CHVs who received supportive supervision. 44% of the CHAs indicated that they conduct home supportive supervision to the CHVs on a monthly basis. Health commodity management activities topped the list of activities carried out by the CHAs during the supportive supervision visits (figure 7).



**Figure 7: Supervision activities by the CHAs**

### 4.3 CStock

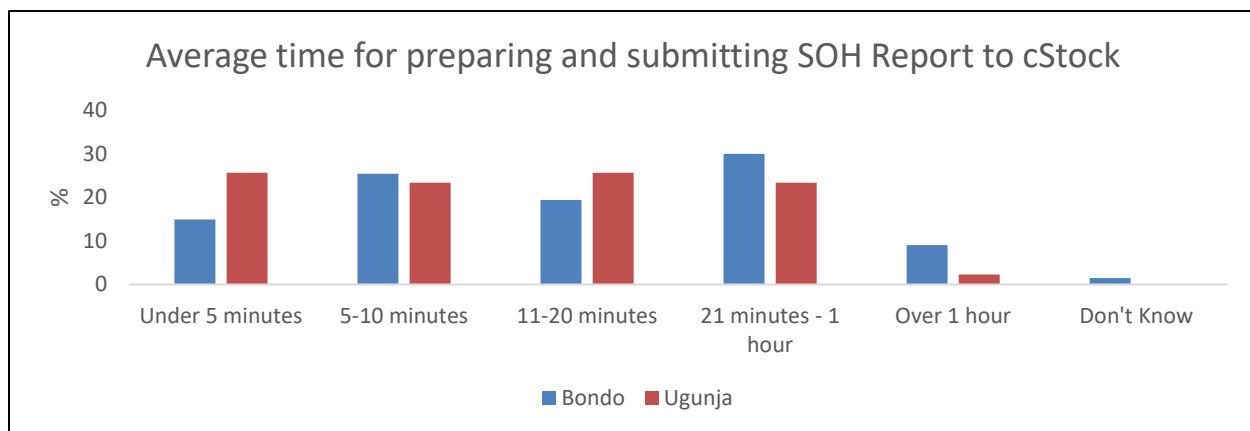
Having trained nearly all the CHVs on the cStock platform during the roll out of the intervention in February and March 2018, 85% of the CHVs reported to have been trained on the platform (Application or SMS) during the end line assessment. This is in comparison to 56% of the CHAs who reported to have been trained in both platforms (Figure 8). Training majority of the CHAs in both platforms was beneficial since as they supervise the CHVs in their community unit they are able to offer support to those using the App as well to those who use SMS. Only slightly more than half (59%) of the drug store incharges reported to have been trained on the cStock approach. This can be attributed to their busy schedules hence majority of them sent representatives during the original cStock trainings. This led to 64% of them being unable to access the cStock dashboard hindering their ability to monitor the performance of the community units linked to their facility without the assistance of the CHAs. It would be good to train the drug store incharge in future since they play a key role in the issuing of commodities as well as ordering of commodities from KEMSA.



**Figure 8: CHVs and CHAs trained to use Application or SMS**

The data collectors were able to see the cStock app in 85% of the CHVs and 89% of the CHAs. 86% of the CHVs had their job aid with them during the assessment period as opposed to 19% of the CHAs. The minimal number of CHAs who had their job aid at the time of the assessment was because most of the CHAs were not interviewed at their health facility. In addition, some of the CHAs store their job aids and SOPs at home and they had not carried them at the time of the assessment. The job aid/SOP serves as reference materials to the users in case they have forgotten any process. Based on the literacy level of the CHVs, the SOPs and job aids were critical in helping them get used on how to navigate the cStock platform or any other process. The high retention rate of the SOPs/job aid by the CHVs show the importance of providing these simplified documents during training of CHVs.

90% of the CHVs use the application to submit the required reports as opposed to the SMS version. The average time taken by the CHVs to submit their stock on hand report to cStock varied across the two sub counties. The variation is between under 5 minutes and less than one hour. A few of the CHVs (6%) take more than one hour to submit the SOH report as shown in Figure 9.



**Figure 9: Average time taken by the CHVs to prepare and submit SOH report to cStock**



Minimal time taken to submit cStock reports by the CHVs shows that the cStock processes are simple and therefore this results to the acceptability of the approach. In addition, minimal time to submit reports results to more time being available to the CHVs to conduct others duties. It is therefore not surprising that 89.3% of the CHVs indicated that cStock helps them reduce workload.

When asked what they use information from cStock for, follow up on non-reporting CHVs topped the list (69%) followed by determine how much to resupply the CHVs (58%) among other uses by the CHAs as show in figure 10.

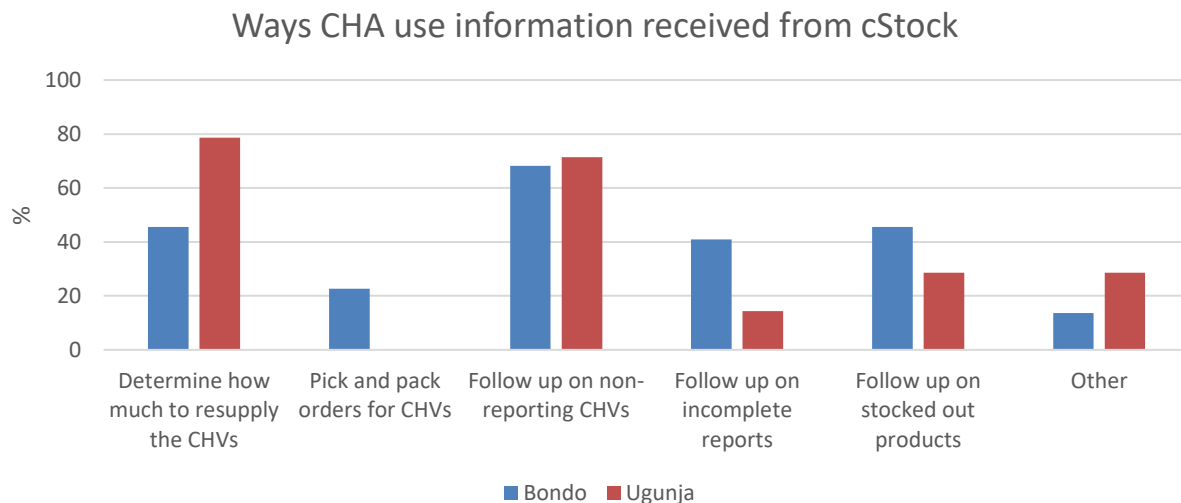


Figure 10: Ways CHAs use information from cStock

Despite the training and ongoing mentorship, 35% of the CHVs reported having challenges transmitting cStock reports. Poor network was cited as the challenge experienced by majority of the CHVs (59%) Figure 11. Although the same challenge was highlighted by the CHA, the percentage facing this challenge was low (22%) since most of the facilities where CHAs are based have reliable network connectivity. Processing emergency orders and values missing from the dashboard were among other challenges highlighted by the CHAs as shown in figure 12.

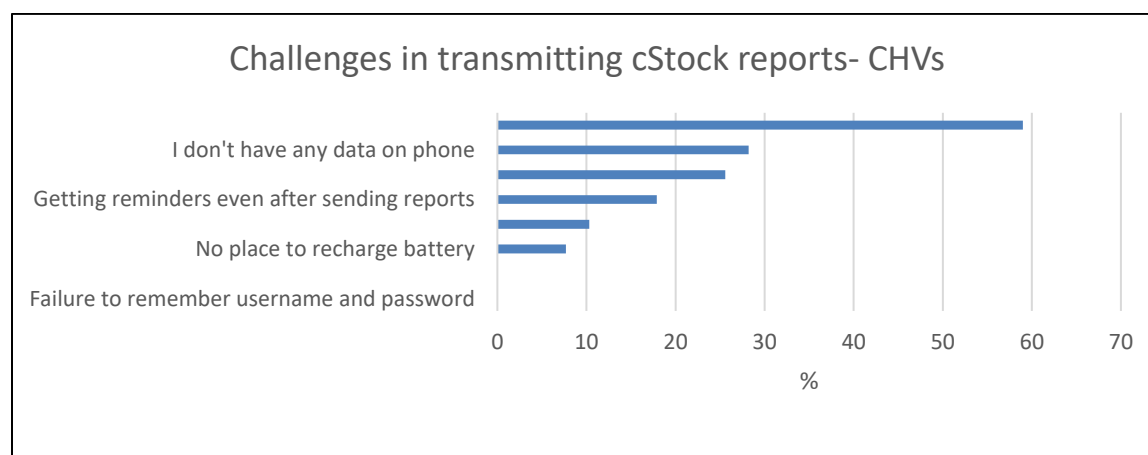


Figure 11: Challenges in transmitting cStock reports-CHVs

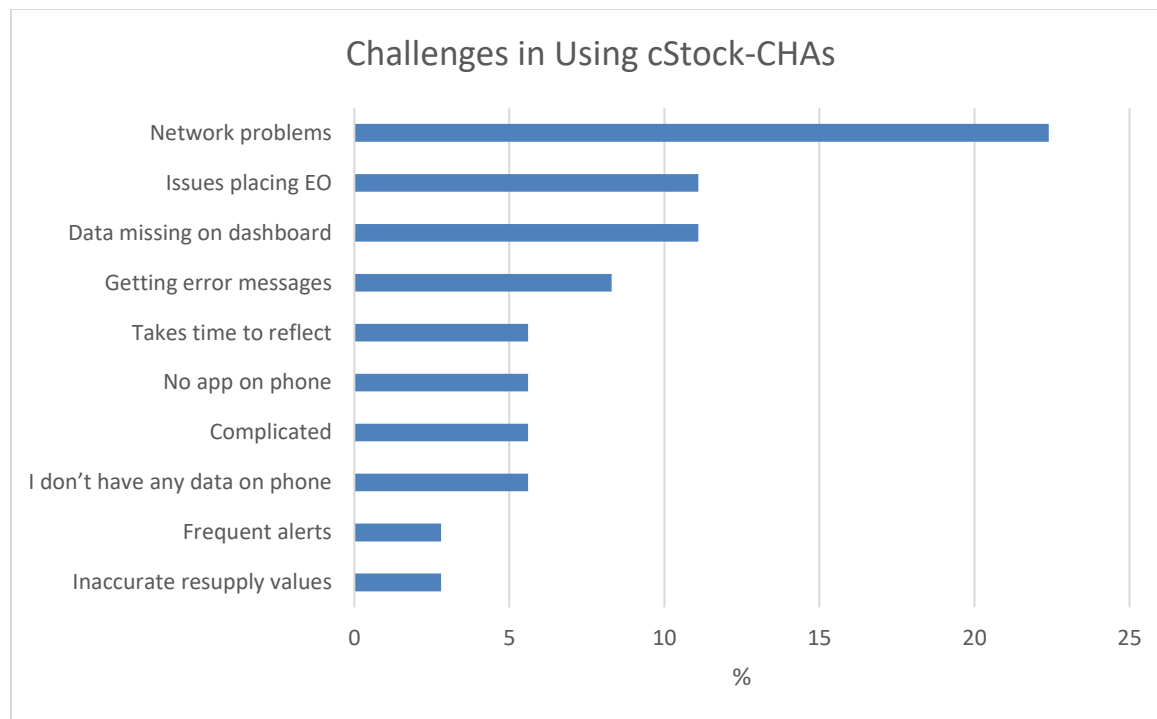


Figure 12: Challenges in using cStock-CHAs

Majority of the CHVs find it easy to use the cStock platform as shown in Figure 13. Midline results corroborate this observation; according to some CHAs in Bondo, cStock is easy to use since it basically entails entering data into a phone, a user friendly mobile application. According to them 90-95% of their CHVs are comfortable with the app. According to a CHV in Kapiyo CU, *"cStock is easy to use since we already have the knowledge from the training and I use it from the comfort of my home"*. From Got Osimbo CU in Ugunja, a CHV reported that cStock is easy to use since they do not have to walk for long distances during reporting. The app is practical and needs little extra knowledge to understand and use. HFICs equally reported that the app is easy to use since they only log into the dashboard.

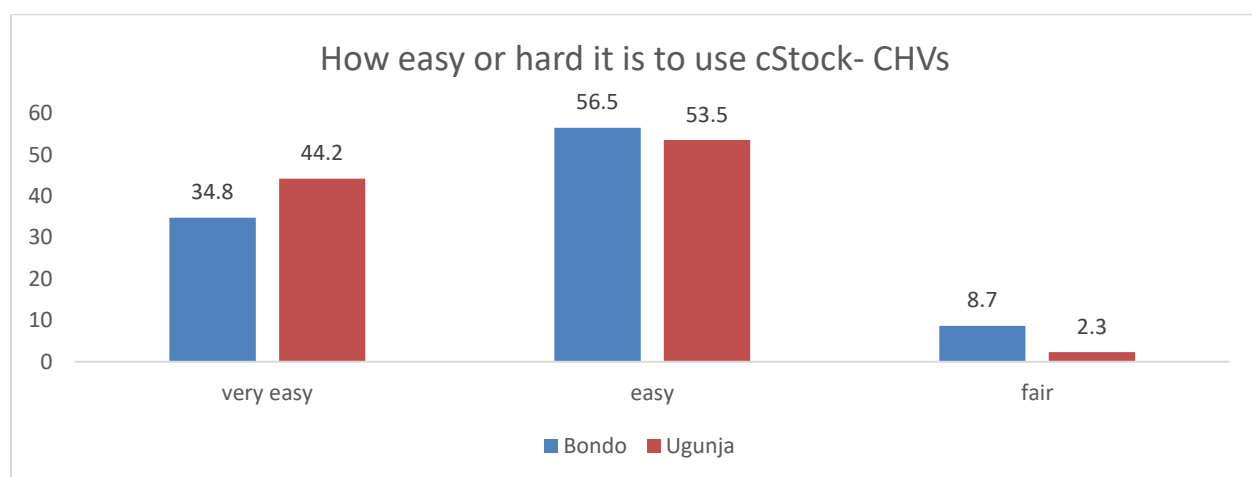


Figure 13: Ease of using cStock-CHVs

When asked about which aspect of cStock do they like, CHVs indicated that the emergency reporting process as the least liked aspect as depicted in Figure 14. This could be attributed to the complexity of the process. The complexity of this process was also noted during the midline assessment. There is therefore a need to simplify the emergency order reporting process in order to allow CHVs to place an emergency order when they experience low stock to avoid stock outs. Resupply values calculated automatically by the system once the CHVs submit the required reports was also listed as an aspect the users like least. For the resupply values to be displayed on the dashboards, there must be SOH and receipt report for two consecutive months. This is to allow the calculation of the average monthly consumption. Failure of the CHV to report for two consecutive months in return missing their resupply value could have resulted to the respondents indicating resupply values as one of the least liked aspect of cStock. Mentorship to the CHVs to encourage them to report on monthly basis would therefore help address this challenge.

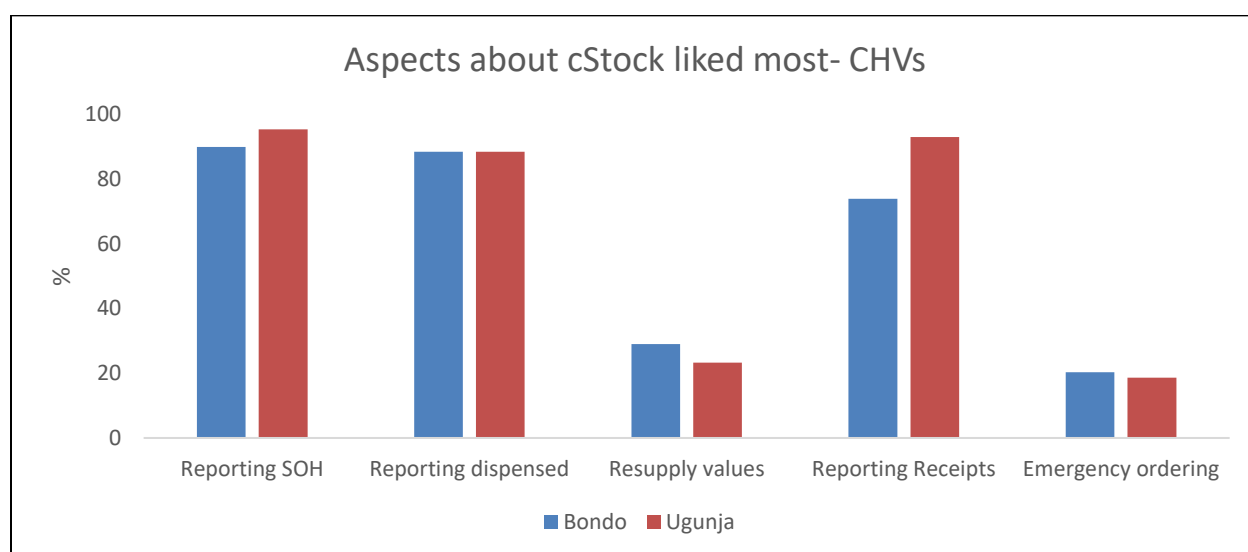


Figure 14: Aspect about cStock liked most by CHVs

Compared to the CHVs, the aspect about cStock liked most by the CHAs was the dashboard (92%). The CHAs use the dashboard to monitor the performance of the CHVs as well as to get the resupply values. This indicates its usefulness in helping the CHAs in their duties. Similar to the CHVs, the emergency ordering process was the least liked by the CHAs indicating that the challenge with this process cuts across various cadres and therefore there is need to re-look at the whole aspect of emergency ordering process.

Other benefits of using cStock were highlighted by the different cadres during the assessment. These include keeping the users updated, provision of data for managing health commodities, accountability of commodities issued, reduction of workload, reduction of commodity wastage among others. Reduced workload was noted as the greatest benefits of using cStock by the CHAs and the CHVs as shown in figure 15.

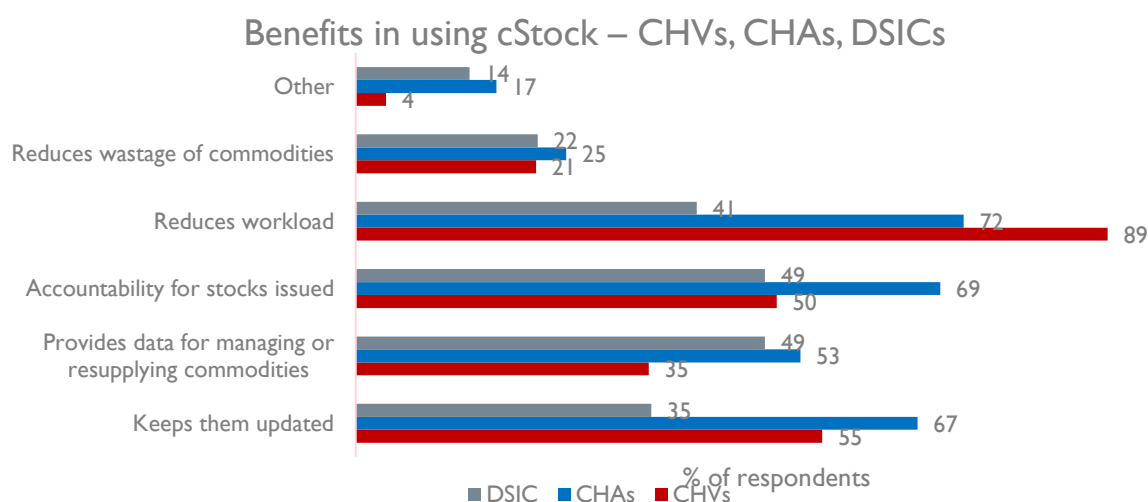


Figure 15: Benefits of using cStock: -CHVs, CHAs, DSI

All the CHVs and CHAs interviewed would like cStock to continue. This implies that they have seen the benefits of the approach as they execute their duties.

#### 4.4 Meetings

The IMPACT Team approach is one of the critical component of cStock. IMPACT Teams (ITs) provide a structured approach for using data and create a culture of joint problem solving. ITs were established at the facility as well at the sub county level. Nearly all the CHVs interviewed (99%) indicated to have attended an IMPACT team meeting of which 86% reported to have attended an IMPACT team meeting the previous month. 94% of the CHAs indicated that they regularly organize and conduct IMPACT Team meetings with the CHVs on a monthly basis. This shows that the CHAs have embraced their role as the leader in organizing and facilitating the community IMPACT Team meetings. Several topics are discussed during the monthly IMPACT Team meetings. As depicted in Table 2 there was an increase in discussing health commodity related topics. This shows the efforts put in place by the IMPACT teams in strengthening the community health supply chain.

	Baseline	End line	P value
Case management	76%	57.40%	0.0189**
Household visit	55.80%	38%	0.0809
Reporting	75%	74.10%	0.8967
Performance	57.70%	74.10%	0.041**
Stock Management	42.30%	46.30%	0.6969
Managing expiries and overstocks	27.90%	19.40%	0.4893
Monitoring stock outs	30.80%	8.30%	0.1732

Table 2: Topics Discussed During IMPACT Team meetings

To objectively assess the performance of their community units, majority of the CHAs (83%) review the cStock dashboard during the IMPACT Team meeting. However, it was noted that there is more effort put in reviewing some indicators as opposed to others. The mostly discussed indicators during the monthly meeting include monthly CHV reporting rates (79%) and monthly CHV receipt reporting rates (53%). Reporting rate is a low hanging indicator to review, troubleshoot and take corrective action as opposed to other indicators that require either higher level influence/action. Performance in other indicators e.g. stock status is affected by many factors e.g. the stock status of the link facility, the reporting rates etc. and this therefore may hinder the IMPACT team in affectively addressing them.

At midline assessment, participation in IMPACT team meeting by the facility incharges was noted as a challenge. This is because of the many roles they play in addition to attending to patients. Despite 92% of the health facility incharges acknowledging the importance of IT meetings, only 69% of them reported to have attended an IMPACT team meeting with 30% only having attended two times since the inception of these meeting in June 2018. This shows that there is lack of consistency in attending these meeting which could be as a result of their many competing tasks. Lack of consistency may hamper their ability to help in troubleshooting issues identified during the IT meetings hence affecting the performance of the community unit.

Recognition of good performance help to motivate the IT members to continue improving the supply chain. IT leaders were provided with low cost and no cost ways of motivating the IT members as well as encouraged to develop a recognition plan. It was evident from the assessment that recognition was part of the IT process. 79% of the CHVs reported to have been recognized for their good performance. Word of appreciation was the most preferred way of recognizing good performing CHVs as shown in figure 16.

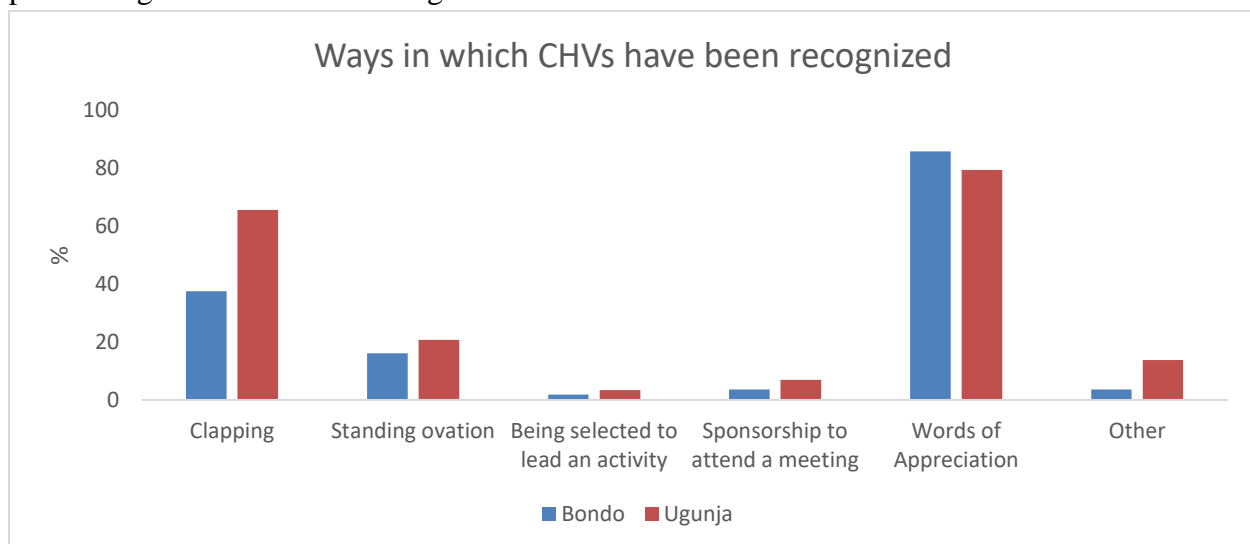


Figure 16: Ways in which CHVs have been recognized

For recognition to be objective; there is need for the IMPACT Team leaders to develop a recognition plan which details the criteria used to identify best performance, level of recognition, frequency and ways of recognition. The CHAs were trained on how to develop a recognition plan during the roll out training; however, at the time of the end line assessment only 56% of the CHAs had a documented recognition plan. Close follow up to ensure a documented recognition plan is in place is required to ensure objectivity of the recognition.

#### 4.5 CHV Reporting

CHVs complete various forms and reports as they execute their duties. The data in these reports is submitted to the next level to inform operational and strategic decisions. Since the literacy level of the CHV is low, having a job aid or SOP is critical for them as these acts as a reference materials in case they have forgotten how to send the reports. Only 3% of the CHVs did not have the job aids issued during the roll out training. This is a significant shift from baseline where 51% of the CHVs reported not having a job aid on reporting and requesting health commodities. Failure to have a job aid or SOP may affect the quality of data submitted from this level. As shown in figure 17, there was a drop from baseline to end line in the percentage of CHVs taking more than one hour to complete the reports. An increase in the percentage of CHVs taking under 10 minutes, 10-20 minutes and 21min to 1hr was observed from baseline to end line. This implies providing knowledge and skills to the CHVs on how to complete the reports during the roll out training was effective. This is supported by the fact that there was a 14% decrease from baseline to end line in the number of CHVs who cited complexity of completing the forms as a challenge.

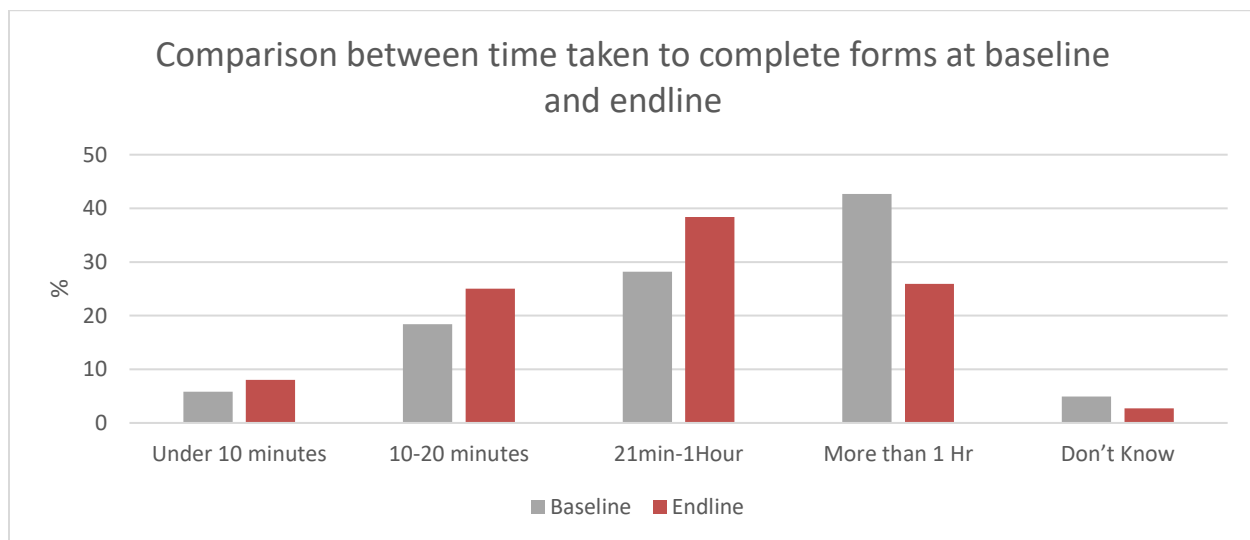


Figure 17: Comparison between time taken to complete forms at baseline and end line

At baseline the RDT & AL reporting form was most common but it did not include all commodities managed by CHVs. By endline 82% of CHVs reported that they were using the inventory card to report on all commodities, a tool that was introduced as part of the cStock approach as seen in figure 18. 100% of CHAs reported they regularly receive inventory control cards from CHVs for review. Common problems reported by CHAs on reviewing the inventory control cards:

inaccurate data (64%) and incomplete data (39%). There was an increase in the use of the treatment and tracking register between baseline and endline as it was reintroduced by the project – this is an important tool for community case management.

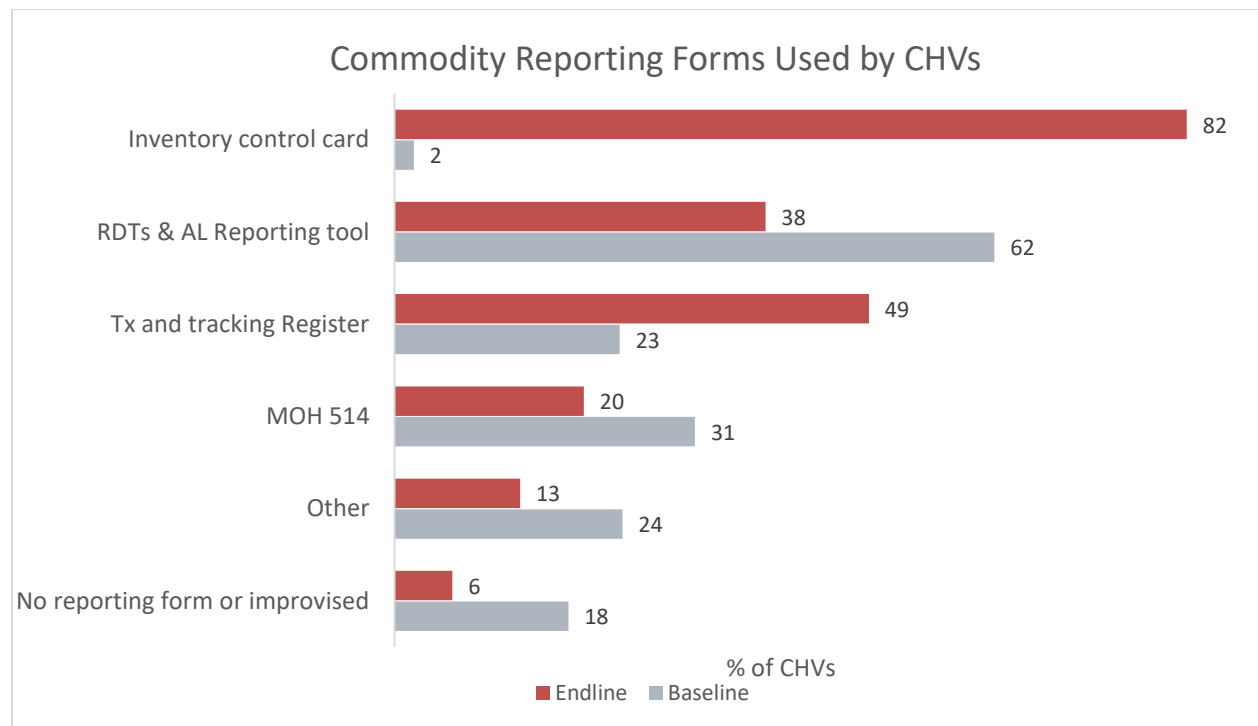


Figure 188: Commodity reporting forms used by CHVs at baseline and endline

#### 4.6 Performance in Key indicators from cStock dashboard

At the end of every month the CHVs are required to submit their SOH report to cStock platform by the 28<sup>th</sup>. Any report submitted after that is categorized as late reporting. The roll out of the platform was completed in Mid-March 2018 hence the time period considered for trend analysis is between April 2018 to October 2018. As observed in Figure 19, there has been gradual increase in reporting rates (overall reporting and on time reporting). The overall reporting has been sustained above 80% from June 2018 when the IMPACT Team meetings were implemented in most of the community units. This shows the important role the meetings play in improving availability of data. During the IMPACT Team meetings, the team members review their performance and identify reasons for non-reporting, taking corrective actions to improve reporting. There has been notable increase on the on time reporting ensuring the data is available on time for operation and strategic decision making. A continuation of the observed trend indicated that in the near future the on time reporting will catch up with the overall reporting indicating that late reporting will be eliminated.

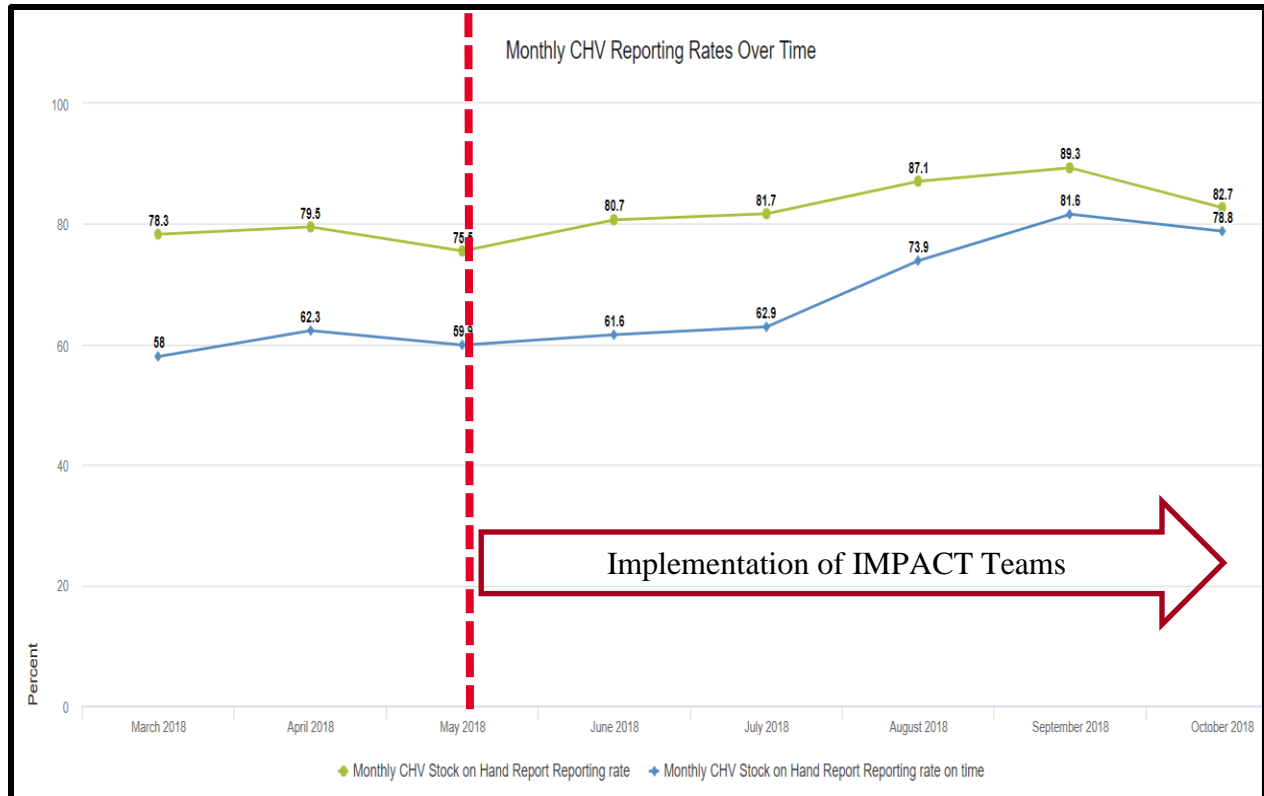


Figure 19: Monthly CHV Reporting rates overtime

To foster accountability of commodities issued to the CHVs and to allow the automatic calculation of the resupply values by the system, the CHVs are expected to report on the quantity of commodities received every month. These reports are expected by the 5<sup>th</sup> of every month. Unlike the SOH reporting, receipt reporting has been lower as indicated in figure 20. 80% and above reporting was only achieved in September and October 2018. This low performance could be attributed to the observed stock out for most of the commodities that was experienced in the two sub-counties. Some of the CHVs failed to submit a zero receipt report when they don't receive commodities. A dip in performance was observed in June 2018. This was as a result of the change in the calculation and visualization the indicator.



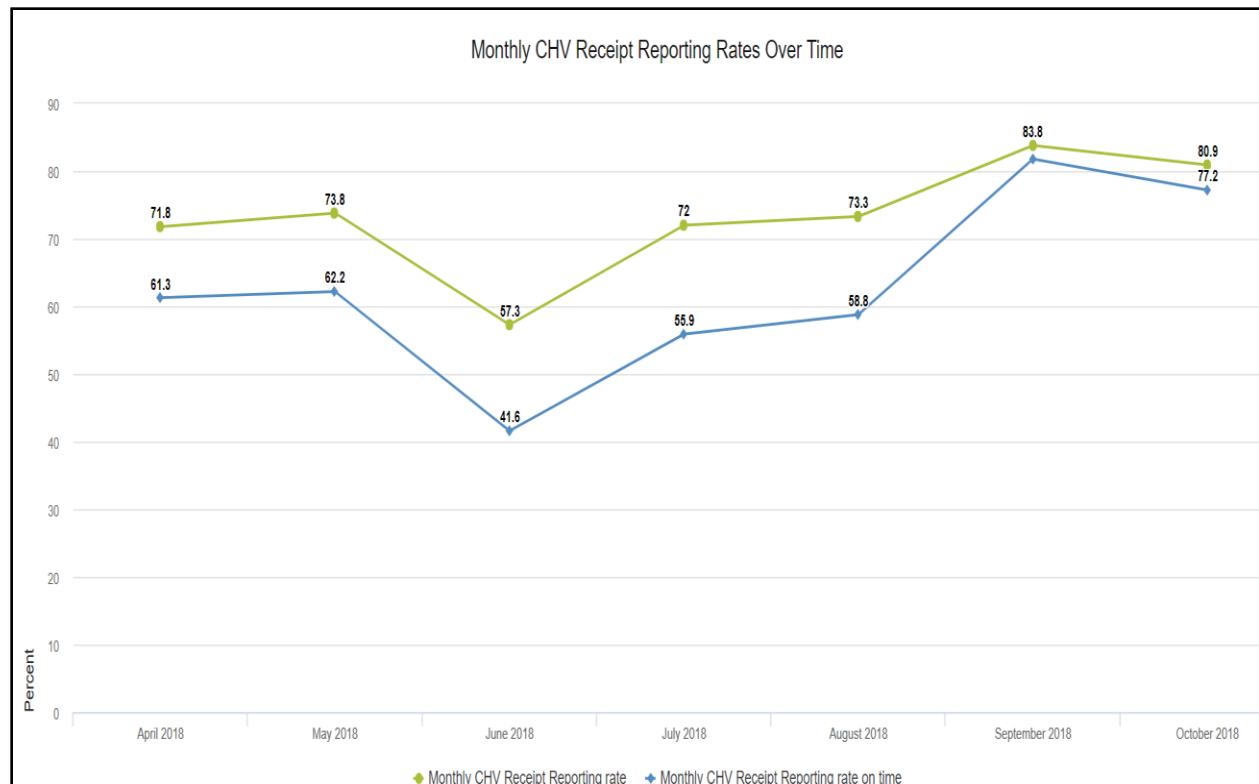


Figure 20: Monthly CHV Receipt reporting rates over time

Availability of adequate health commodities to the CHVs ensures that they are able offer their services and reduces referrals to the health facilities. This also boosts their morale and increases the CHV credibility in the society. The stock status of the CHVs is monitored on monthly basis to inform their supervisors on where to direct actions in case of stock outs or overstocks. In addition to the visualization of the stock status for each CHV, the aggregate stock status per commodity per sub county is visualized. This helps the sub county management team to make informed decision on corrective actions to be taken for overstock/understock/stock outs.

Stock Status Overtime (Stockout - Red, Understocked - Yellow, Adequately Stocked - Green, Overstocked - Orange)												
		ACT 06s Months of Stock	ACT 12s Months of Stock	ACT 18s Months of Stock	ACT 24s Months of Stock	Zinc/ORS Months of Stock	RTM Months of Stock	Paracetamol Months of Stock	Male Condoms Months of Stock	Albendazole Months of Stock	Zinc Months of Stock	ORS Months of Stock
Bondo	April 2018	1.6	2.8	1.2	1.4	3.1	1.5	1	1.5	5.7	26.7	3.6
	May 2018	1.5	1.6	2.6	1.6	3.6	1.1	0.73	1.7	1.6	1.1	7.5
	June 2018	1.3	2	1	2.1	5.2	1.2	1	2.1	2.9	16.7	
	July 2018	0.59	0.49	0.59	0.57	1.6	0.43	0.57	0.91	2	2.3	
	August 2018	0.29	0.39	0.13	0.25	1.1	0.12	0.15	0.53	0.82	0	
	September 2018	0.22	0.02	0.41	0.26	0.91	0.04	0.12	0.86	0.79	0.7	
	October 2018	0.07	0.06	0.21	0.34	1.3	0.03	0.93	0.74	0.71	0	
Ugunja	April 2018	0.89	1.1	1.4	0.84	0.63	1.4	0.48	3.5	3.2	7.1	
	May 2018	1.1	0.55	0.67	0.87	1	1	0.79	5.4	1.6	1	1.9
	June 2018	0.74	1.6	0	0.54	2.8	1.1	0.81	3.2	2.7	4.3	4.4
	July 2018	0.47	0.65	1	0.17	2.5	0.2	0.48	1.2	2.4	1.3	3.2
	August 2018	0.06	0.2	2	0.07	0.32	0.01	0.18	0.78	1.6	0.82	1.7
	September 2018	0.02	0.17	0	0.05	1.4	0	0.61	0.91	2.3	0.65	1.5
	October 2018	0.01	0.39	0	0.06	0.95	0	0.37	1	1.1	0.68	1.4

Figure 21: Sub County Stock Status over time

As observed in Figure 21, the two sub counties were adequately stocked or overstocked for most commodities during the first three months of implementation (April to June 2018). From July 2018 the sub counties started to experience low stock of some of the commodities notably anti-malarial and malaria diagnostic kits, however male condoms, albendazole and zinc/ORS continued to be adequately stocked. Stock out/low stock of anti-malarial was attributed to stock out of malaria diagnostic kits experienced in the country. As the treatment protocol dictates, CHVs are only supposed to give anti-malarial treatment after a confirmation through rapid testing therefore since mRDTs were stocked out facilities also did not issue antimalarial treatments and sometimes all other commodities to the CHVs resulting in the observed low stocks.

Percent of CHVs Stocked Out Over Time (0 - Green; 1-10 - Yellow; 11-50 - Purple; Above 50 - Red)														
		Percent of CHVs with ACT 6s stocked out	Percent of CHVs with ACT 12s stocked out	Percent of CHVs with ACT 18s stocked out	Percent of CHVs with ACT 24s stocked out	Percent of CHVs with Zinc/ORS stocked out	Percent of CHVs with RDT stocked out	Percent of CHVs with Paracetamol stocked out	Percent of CHVs with Male Condoms stocked out	Percent of CHVs with Albendazole stocked out	Percent of CHVs with Chlorine stocked out	Percent of CHVs with Zinc stocked out	Percent of CHVs with ORS stocked out	Percent of CHVs with Tetracycline Eye Ointment stocked out
Bondo	April 2018	15.7	23.4	47.1	16.5	13.4	9.6	27.1	26.1	16.7	100	100	100	100
	May 2018	35	32.3	50	26.8	19.4	24	36.9	21.2	16.7	100	100	100	
	June 2018	57.3	76	91.2	54	35.8	39.1	71.6	52.8	55.6	100	100	100	100
	July 2018	74.4	92.7	97.1	78	56	73.5	81.1	69.9	52.2	88.9	100	100	100
	August 2018	92.2	94.9	98.9	91.3	70	90.8	91.6	83.6	75	100	100	100	100
	September 2018	97.8	99.3	99.3	96.3	76.7	98.7	96.5	86.6	82.7	100	98.2	100	100
	October 2018	99.3	99	99.6	99	80.1	99.3	97	84.3	80.4	100	100	100	100
Ugunja	April 2018	23.7	36.8	100	38.8	75	6.7	42.1	23.1	16.7	62.5	25		
	May 2018	24.1	57.9	100	40.6	38.9	25.6	32.8	35.3	20.9	80	25.9	11.1	
	June 2018	49.3	75.5	100	68.5	87.7	19.7	59.1	35.6	36.3	100	50.9	67.3	100
	July 2018	68.3	88.3	100	87.4	79.8	79.6	53.2	54.7	51.4	100	59.4	71	100
	August 2018	94.3	95.2	99.2	95.9	94.5	98.4	83.1	75	71.3	100	81.7	85.2	100
	September 2018	99	97.4	100	98.7	88.1	100	74.4	81.2	69.8	95	89.3	92.6	100
	October 2018	99.5	97.9	100	99.4	91.9	100	84.5	81.4	77	95.9	95	95.9	96.7

Figure 22: Percentage of CHVs stocked out over time

During the implementation period of the project the two sub counties experienced high stock out of most of the commodities (above 50% of the CHVs were stocked out) more so from June 2018 onwards (Figure 22). This corroborates the stock status results. There is therefore a need to advocate for more commodities to be allocated to the community health program in order to ensure its effectiveness.

#### 4.7 CHA Requesting and Resupply

The assessment sought to establish the tools the CHAs use to resupply the CHVs as well as the method they use to determine how much to supply the CHVs. There was a significant decrease in the percentage of CHAs who resupply the CHVs based on the amount of commodities the CHV dispensed last month ( $p=0.07$ ) Figure 23. This could be attributed to availability of resupply values from cStock. At end line assessment half of the CHAs were using the resupply values on the cStock dashboard to resupply the CHVs.

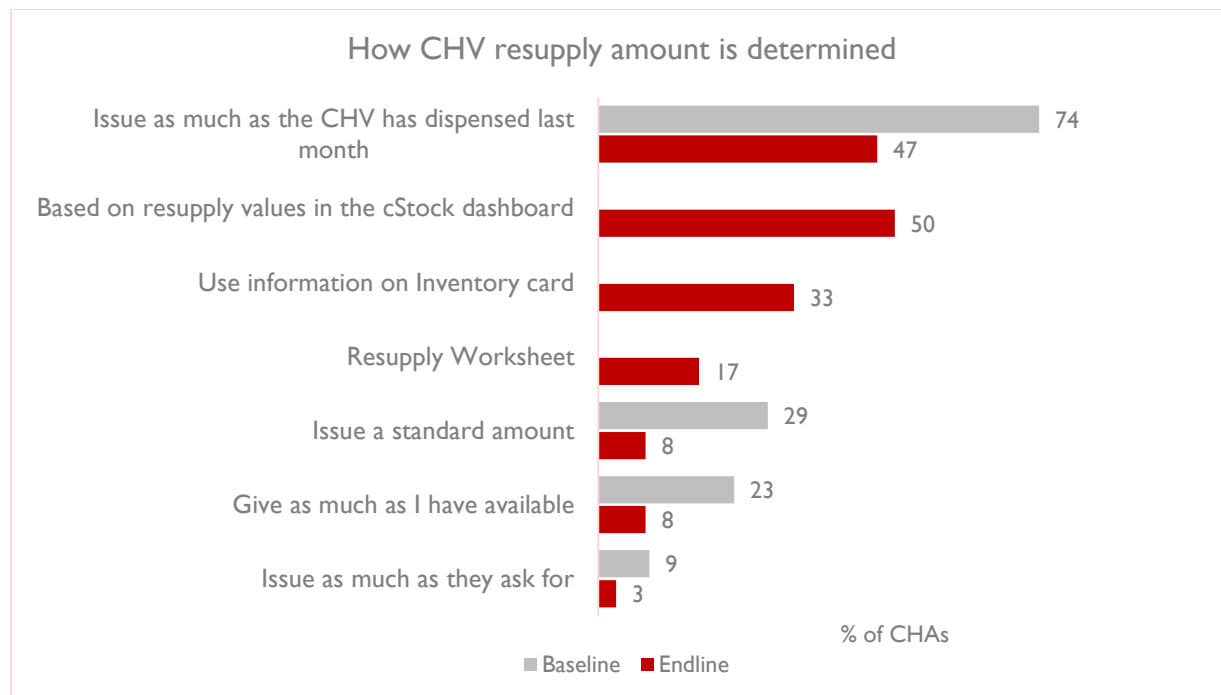


Figure 23: How CHAs determine what quantity to resupply the CHVs

There was a reduction in the number of CHAs who use improvised forms or no forms to document the quantity resupplied to the CHVs (figure 24). This could be attributed to the presence of a resupply worksheet that was introduced during the roll out of the intervention. The resupply worksheet help document the quantity issued to each CHVs to help in accountability and traceability. As observed in baseline nearly all the CHAs are using the S11 to order commodities from the link facility store.

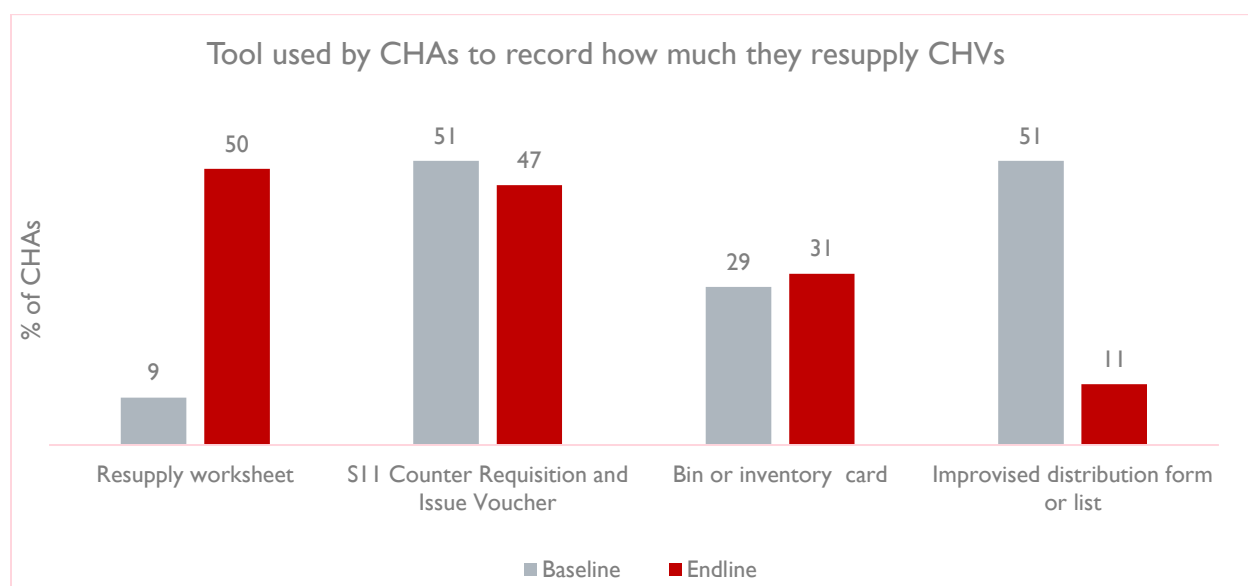


Figure 24: Tools used by CHAs to record quantity resupplied to CHVs

## 4.8 Transport

Distance to the link health facility may hinder resupply of the CHVs. Long distance may discourage the CHVs to travel to the link facility to pick the health commodities as well as attend IMPACT team meetings. In case a CHV experiences stock out or low stock in the middle of the month he/she may fail to place an emergency order or fail to go pick the resupplies once the emergency order is processed if they have to travel for long distances. As identified during baseline assessment as well as during end line assessment, more than 70% of the CHVs take less than one hour to travel to the link facility. 45% of the CHVs travelled to link facility once in the last 30 days to pick health commodities. A higher number of CHVs (42%) in Ugunja as compared to 13% in Bondo did not travel to their link facility in the past 30 days. This could be as a result of lack of fare experienced by the CHVs in Ugunja since 96% of the CHVs in Ugunja cited this as one of the transport challenge they face. Figure 25.

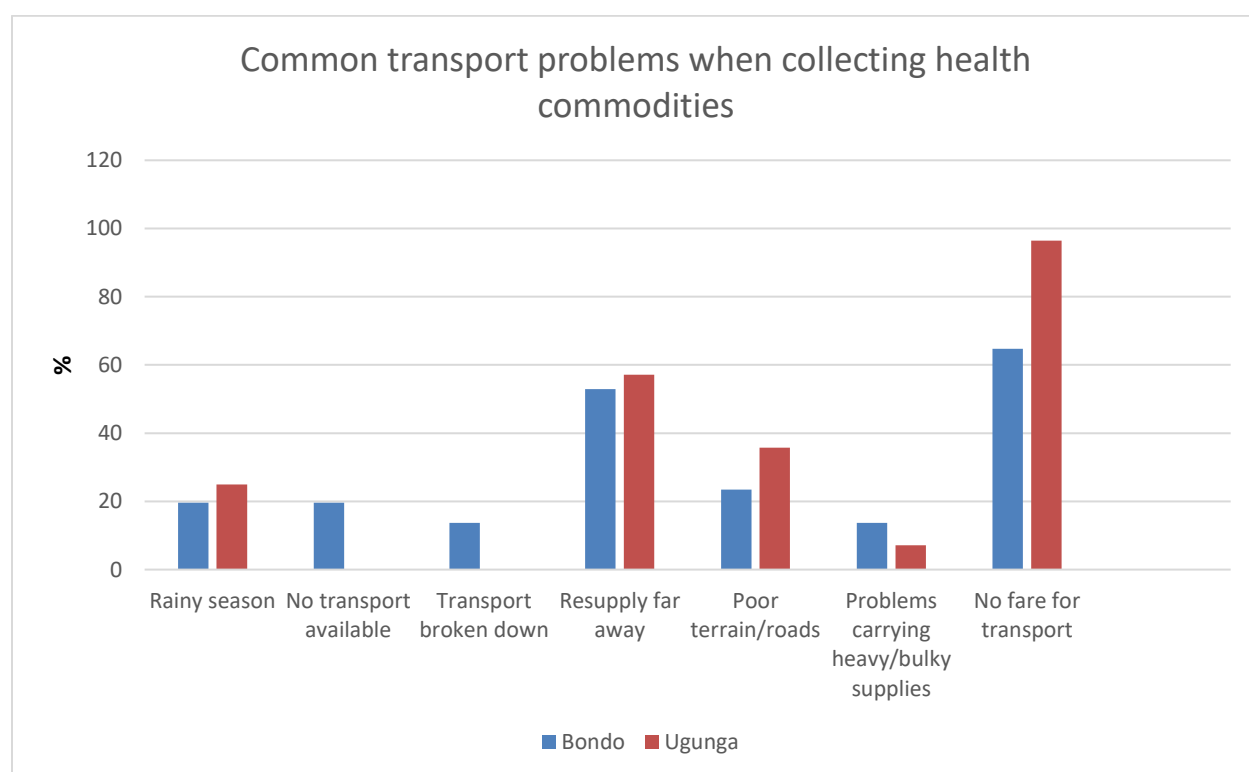


Figure 25: Common transport problems when collecting health commodities

## 4.9 Storage of health commodities by the CHVs

Good storage practices ensure that the medicines maintain their quality and effectiveness so as to be useful in treating sick children when needed. There was no significant change in storage conditions from baseline to end line. More than 50% of the CHVs still store their commodities and paper records in the bedroom inside a cardboard box or carton. This is likely because the bedroom could be considered by the CHVs as a safe location to store the health commodities and reporting

tools as it's' access by unauthorized persons is limited. Improving the storage of health commodities was not within the scope of the project therefore this explain the reason why there was no significant change in the storage conditions however the conditions observed could help the county government identify areas of focus as poor storage of commodities and paper records could hamper the effectiveness of the community health program.

#### **4.10 Communication**

As observed in baseline, majority of the CHVs (93%) still use smart phones as their preferred gadget and supports the reason why majority of them were trained on the App as opposed to SMS. 85% of the CHVs had the app installed on their smart phones and over 90% of them reported to have used the smart phone to send cStock reports. Having used the smart phone prior to training on cStock made it easy during the training as majority of them were familiar with how to navigate the phone. This may not be the case to other geographies where penetration of smart phone is not high and it may necessitate the need for an assessment before the roll out of the intervention in other regions so as to inform development of either the SMS or app version of cStock. There was no change in consistency of the mobile and internet network as well as access to place to charge the phones for the CHVs from baseline to end line. The internet coverage for CHVs was consistent and reliable for 59% of the CHVs and this did not affect them in submitting their report since the on time monthly CHV reports have been above 75% from June 2018. 94% of the CHAs use smart phones as their preferred gadget of communication. 72 % use smart phone for cStock and 28% use tablets. In addition, 69% of them are able to access a computer out of which 55% have internet access on the computer, which is consistent and reliable for 50% of the CHAs. Since the cStock dashboard requires internet access, it means majority of the CHAs are able to access the dashboard either on their phone or on the laptop and they can therefore review the performance of their community unit on a monthly basis.

#### **4.12 Stock Status**

Majority of CHVs (82%) reported having experienced a stock out of any of the commodities they managed in the last 30 days. As seen in figure 26 stock out rates, based on observations on the day of visit, for all commodities managed by the CHVs increased significantly from baseline to end line.

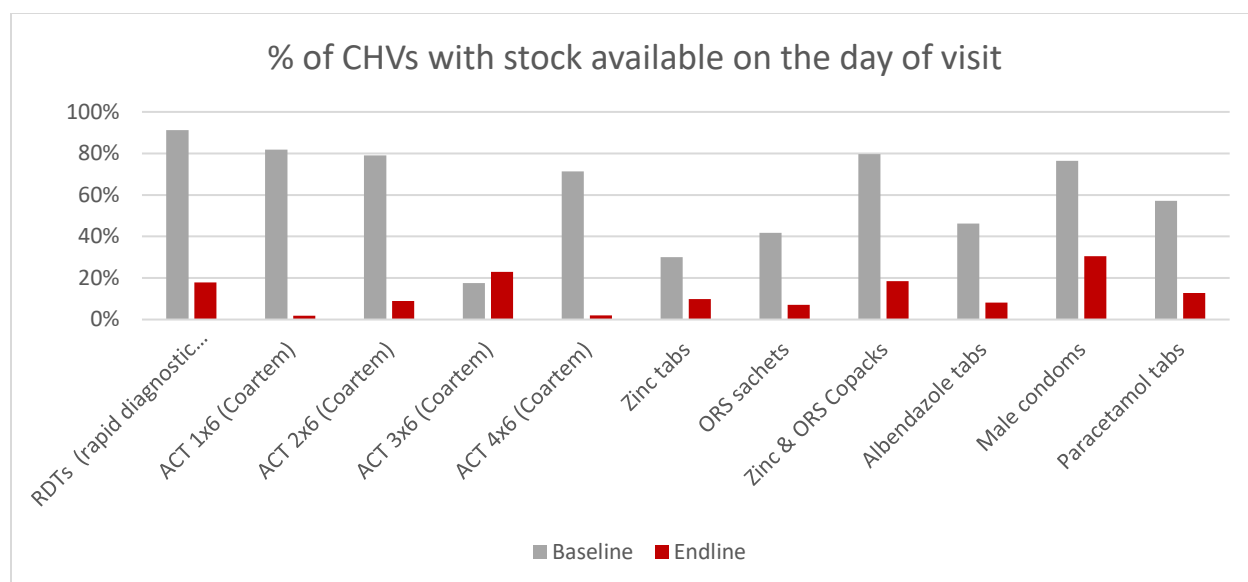


Figure 26: Percentage of CHVs with stock available on the day of visit

During the IMPACT team meeting in July 2018 it was established that most of the facilities in the county were stocked out of Malaria RDTs. The mRDTs were not available in KEMSA and the county was advised to procure from local vendors but this did not take place. As a result of stock out of mRDTs, CHVs were not supplied with antimalarial. The treatment protocol dictates that antimalarial should be given only after confirmatory testing. This therefore resulted in observed stock out of antimalarial. In addition, most facilities stopped issuing other commodities handled by the CHVs as some facilities incharge associate community health program with management of malaria only. This contributed to the observed stock out of other commodities when mRDTs were stocked out. There is need to sensitize the facility incharge on the CHV kit and iCCM so that there is continuity of other case management services even when there is stock out of mRDTs. Stock out of commodities was mentioned across as a major challenge experienced during the implementation on the cStock approach. 71% of CHVs mentioned health facility stock out or short supplies as one of the problems they experience when requesting for health commodities. 59% of the CHVs have ever arrived at the health facility but did not receive any commodity. This may discourage them from attending future IMPACT team meetings. 46% of the drug store incharge indicated they have ever delayed issuing commodities to the CHAs and the major cause of the delay cited was stock outs (86%). When stock out is experienced, 44% of the DSI issue what they have while 36% report to the sub county. Despite the complexity of the emergency order process, the CHVs indicated that they do place emergency orders but most go unprocessed by the CHAs who indicated stock out as the cause of failure or delay in processing the emergency orders.

These results show that stock out is a chronic problem in the county and this is affecting the effectiveness of the community health program and there is therefore an urgent need to address this challenge. Figure 27 shows the reported stock out rates of each commodity over the last 30 days as recalled by the CHVs. The county can utilize the cStock dashboard to visualize the stock out rates and the average consumption of each commodity. The dashboard provides critical consumption data that can be used to forecast community health program commodity needs and advocate for more resource allocation.

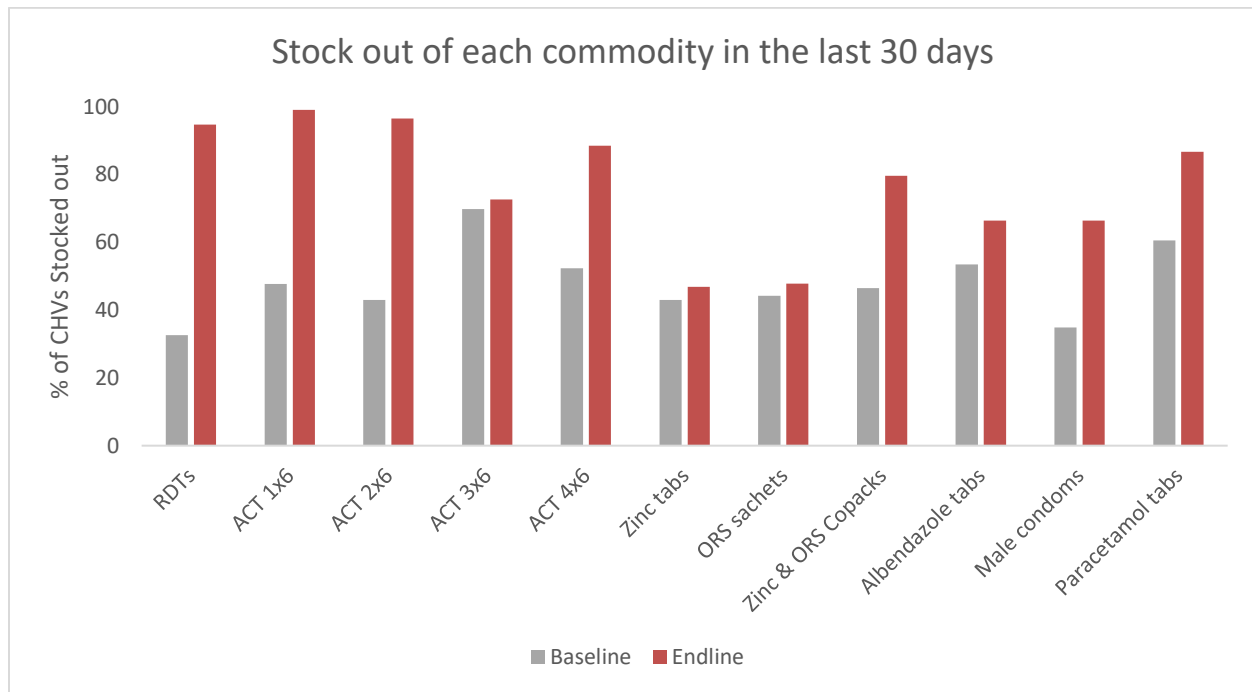


Figure27: Stock out of each commodity in the last 30 days

From the stock status data, the percentage of CHVs and health facility with stock (physical count greater than zero) was computed. As observed in figure 28, higher percentage of facilities had stock as compared to the CHVs for all commodities. A further exploration established that the facilities had been supplied with commodities from KEMSA the month prior to the assessment hence the higher number of facilities with stocks. The facilities had not yet issued the commodities to the CHVs since they were waiting for the end of the month to issue the commodities as is usually the norm.

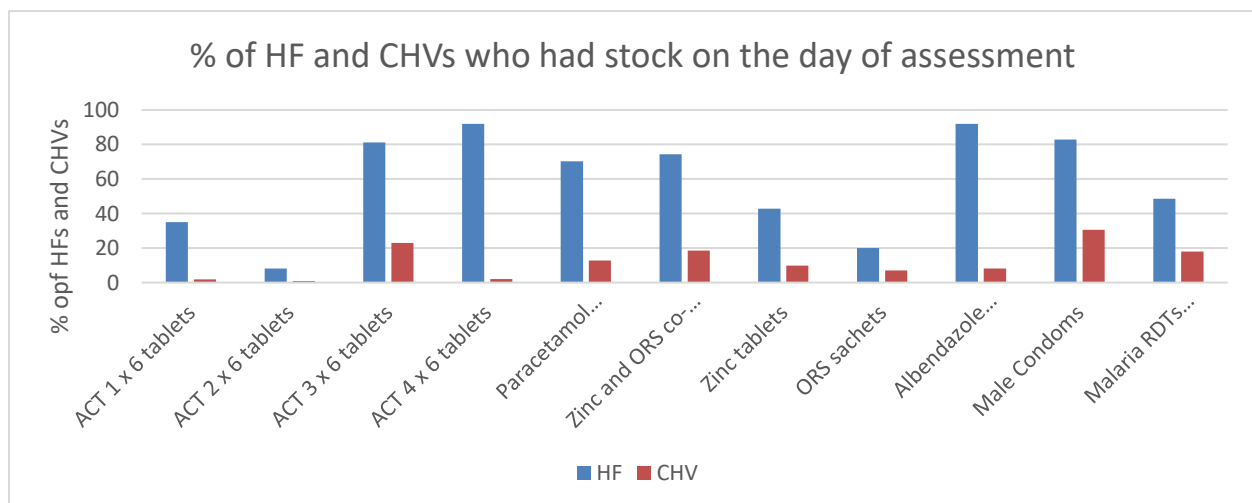


Figure28: Percentage of Health facilities and CHVs who had stock on the day of assessment

Very few CHVs had expired commodities in their possession. This could be attributed to the fact that most of the CHVs were stocked out. This was the same case for health facilities except for ACT 4X6 where 21.6% of HFs reported to have had such expired commodities in their possession.

Consumption of community health commodities was assessed by reviewing the previous month (October 2018) treatment and tracking register that is used by the CHVs to document the quantity of commodities dispensed to the clients they visit. The amount of each commodity dispensed was counted to estimate the consumption. Consumption rates were hard to quantify since data was only available from 26% of CHVs. Reason given for unavailability of the records was that the CHVs submit a copy of the record to the CHA during the IMPACT Team meeting and they are not left with a copy. Most of the CHVs were also not completing the form since they did not have any commodity to dispense. In most instances, the treatment and tracking register was last updated in July 2018 when the CHVs were stocked with most of the commodities. The low percentage of available T&T shows a weakness in the documentation process. There is a need to print this T&T in duplicate so that when the CHV submits a copy to the CHA for review every month they are left with a copy. Stock out of commodities was also affecting completion of records as the CHVs found it to be a waste of time and paper to complete the record with zeros. Stock out of commodities therefore not only affect service delivery but also availability and quality of logistics data. Un-availability of consumption data affected the analysis of data to determine the stock status of the CHVs (stocked out, understocked, adequately stocked and overstocked). The stock status data was therefore obtained from the cStock dashboard.



## **5.0 SUMMARY OF FINDINGS IN RELATION TO MHEALTH EVALUATION FRAMEWORK**

To determine the long-term effectiveness, scalability and ownership of cStock approach, the project adopted the WHO evaluation framework for mHealth initiatives, the framework focuses on three main domains (feasibility, acceptability and effectiveness). Each of the domains have key indicators to guide the measurement as indicated in the methodology section of the report. The following are conclusions based on our evaluation findings and results:

### **5.1 Feasibility (easy to use, learn, relevant and practical)**

cStock (Application and SMS) was found to be easy to use by majority of the users. 94% of the CHVs find it easy to use the cStock platform. Simple workflows that mimic the manual tools and processes used by the CHVs were adopted when designing cStock platform in order not to disrupt the routine processes of the CHVs. This therefore made the platform easy to use for the end users. Seeking user requirements before the design of the platform helped to understand the needs of the users and these were incorporated into the design of the platform.

The ease of use was also enhanced by the comprehensive training that was conducted before the roll out of the intervention. Use of the CHAs as the trainers was beneficial as the CHAs have a better understanding of the CHVs and the environment in which they work as opposed to external trainers, and this has helped to create a rapport during the training plus CHAs can follow up and do continuous transfer of knowledge and skills. The CHAs were trained in adult learning principles and to facilitate better learning and based on the literacy levels of the CHVs, simple, pictorial job aids and SOPs were developed. The CHVs were therefore left with reference materials to aid them in case they got stuck at any of the steps of the intervention after the training.

cStock is very relevant to the end users as it provides the users with critical information to help them in their various roles. For the CHVs, it helps them manage their commodities better. Introduction of an inventory card for the CHVs helped them track their commodity transactions. They are able to know how much of each commodity they have and what quantity is remaining at the end of the month. Training the CHVs on emergency ordering process helped them to track their commodities and get resupplied in case they run low on stocks or are stocked out. cStock dashboard is a relevant and practical element for the CHAs as it helps them not only review the performance of the CHVs but the platform automatically calculates the resupply values for the CHVs. This reduces the workload for the CHA and also ensures that an objective method is used to determine the quantity to resupply the CHVs. At the end line evaluation majority (92%) of the CHAs indicated that the cStock dashboard was the aspect they like most. With the introduction of cStock approach the health facility incharges are now able to visualize and track the commodities issued to the community units. This not only helps in accountability but also they are able to accurately quantify the amounts of commodities required for the community health program.

### **5.2 Acceptability (integrated as routine practice and perceived benefits)**

cStock has become the preferred mechanism to strengthen the community health program supply chain in the implementation sites. CHVs use cStock as the primary means to report their logistics data. The monthly CHV reporting rates has improved from below 75% after roll out in April to

above 85% in October. Within a short implementation period, it is evident that most of the CHVs are using cStock to report their logistics data hence it is becoming the accepted mechanism for reporting logistics data at the community level. More than half of the CHAs rely on the supply values on the cStock dashboard to resupply the CHVs as shown in the end line results. Although this is still a low number, it shows that having the system automatically calculate the resupply values is an integral part of the approach. Objectivity in resupplying the CHVs was introduced and this has helped in ensuring there is no wastage in case of oversupply and reduced stock out in case of under supplying. It was evident that there is increased use of data to inform decision making and strengthen the supply chain. 97% of the CHAs rely on the cStock dashboard to assess the performance of their CHVs.

The IMPACT team approach has become an integral part of the monthly meeting between CHVs and CHAs, where cStock data is used to assess performance and joint problem solving and action planning takes place. 94% of the CHAs organize and conduct IMPACT team meeting on a monthly basis.

Nearly all the CHVs, CHAs and health facility incharges indicated that the monthly IMPACT team meetings are beneficial and 100% of the CHVs and the CHAs would like cStock to continue due to the benefits they have realized. These results shows that the users of the intervention had embraced it and incorporated cStock components (mhealth technology, dashboard and IMPACT teams) in their routine practices

### **5.3 Effectiveness**

The ultimate goal of cStock approach was to ensure availability of adequate health commodities to the CHVs. To achieve this, various elements need to be put in place, presence of timely, accurate and reliable logistics data, visualization of this data in an easy and actionable ways and use of data to inform provision supplies.

Although cStock has improved the visibility of logistics data in a timely manner and the IMPACT Teams are using cStock to monitor the stock levels, stock out rates still remained high due to the short project time frame. Stock shortages during the last three months of the pilot due to debts with the central medical stores were county wide and stock outs of mRDTs especially impacted the community level and requires longer-term efforts to work with the county level to better respond to the needs on the ground. The project did utilize cStock dashboards and county level IMPACT teams to advocate to the county level to address the crisis that was occurring. Unfortunately, action was only taken towards the end of the end line evaluation field data collection.

## 6.0 RECOMMENDATIONS

The following lists of recommendations are proposed for national and county MOH and stakeholder consideration:

- a) Adopt the reporting tools that were introduced during the project implementation phase: The CHV inventory card has helped in recording commodity transaction data and therefore improve commodity management. The CHVs are now able to conduct a physical count and record the data appropriately. The resupply worksheet has helped the CHAs not only have a record of quantity of each commodity issued to the CHV but also the quantity received from the link facility. This helps in tracking commodity movement from one level to another. Adoption of these two forms would greatly improve commodity management at the community level
- b) There is need to clearly define which records the CHVs should submit to the CHA every end of the month. During the assessment, it was established that some CHVs send their completed treatment and tracking (T&T) registers to the CHA while some of the CHVs retain them. Lack of clear instruction hampered the collection of consumption data. To streamline information flow and audit trail, the treatment and tracking register should be printed in duplicate. A completed copy of this record should be submitted to the CHA at the end of the month for review and filing while the CHV retains a copy.
- c) Majority of the CHVs and CHAs indicated that the emergency ordering process was complex. There is therefore a need to simplify this process to ensure that CHVs can easily place an emergency order when they experience low stocks or stock out and the CHA is able to swiftly process the emergency order. This will ensure that the CHVs are adequately stocked throughout the month.
- d) IMPACT Teams have improved the use of supply chain data, team work and unified users to one goal of addressing supply chain challenges. There is need to ensure that the meetings continue to be consistent and the IMPACT team process (review of performance, root cause analysis, action planning and recognition) continue to be followed. Health facility incharges should be encouraged to attend these meeting consistently to assist in solving supply chain challenges as they play a key role in the community health supply chain
- e) To ensure institutionalization of the approach, there is need to have cStock user champions (CHAs, CHVs) within each sub-county who will lead in the troubleshooting of any issues associated with the use of the cStock platforms. Such champions will ensure there is continuity of service even with the exit of the project. Although the cost of data bundles and SMS is not significant there is need for the county to take up these cost and preferably negotiate for a waiver with the service provider. This will ensure that the users continue using the platforms beyond the pilot phase of the project
- f) Develop a standard package for community health program commodities in the county. From the assessment, there was variation on responses on the commodities the CHVs should be handling. This was observed across the two sub counties and also the drug store incharges as well as the sub county health management teams gave different views on the inclusion of some of the commodities. There is therefore a need for the county to develop,

document and disseminate to the various stakeholders the list of commodities for the community health program.

- g) Increase commitment from county and health facilities to allocate sufficient supplies for the community health program at all times. Health facilities can use logistics data collected from the community health to inform their orders from KEMSA hence ensuring enough stocks are available for the community health program when needed. The logistics data will also help the health facilities properly forecast their commodity needs. County government then need to support the health facilities to ensure debts are paid so that KEMSA will fulfill the order.
- h) Lessons learnt in the development of cStock in DHIS 2 should be used to improve the use of DHIS 2 in collecting, visualizing and presentation of community health program. In line with this, there is need for the national government through the relevant department/unit to adopt cStock as the preferred mechanism for strengthening community health supply chain

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