Webinar 2 – mHealth for Supply Chain Management for CCM

August 29th, 2013

SCM Subgroup of the CCM Task Force

Objective

This webinar with the SCM subgroup of the CCM Taskforce will provide examples of mHealth innovations currently in use and explore some of the ways mHealth can be used to enhance supply chain management within CCM programs.

4 Case Studies

- cStock in Malawi - Sarah Andersson
- ODK Scan in Mozambique – Emily Bancroft
- mTrac in Uganda – Davis Musinguzi
- CommTrack – Rowena Luk

Introduction

mHealth for SCM for CCM offers a simple and effective way to improve:

- Communication between levels of the system
- Transmission of logistics data
- Visibility of logistics data up and down the supply chain

Increased visibility of community level data in SCM allows for:

- Better monitoring and managing of the supply chain
- Better planning and quantification

Design Considerations

- Embedding technology as part of system strengthening intervention
- Review other software and build on them where possible
- Consider affordability and sustainability from the outset
- Focus on core workflows initially, don't overdesign
- SMS vs. GPRS
  - Decide whether to use existing phones or provide phones
  - Consider the number of users, data elements to collect and capacity of user base to use the technology

cStock

Sarah Andersson

Country Technical Manager for the SC4CCM Project

cStock: Problem Statement

Malawi Baseline Assessment 2010

- **Product availability hampered by poor use and visibility of community level data**
  - **27%** of health surveillance assistants (HSAs) who manage health products had four CCM tracer drugs* in stock on day of visit
  - **43%** HSAs submitting reports that contain logistics data to HC, and only **14%** of HCs reported passing that information to higher levels
- **Opportunity**
  - **94%** of HSAs surveyed had a mobile phone
  - **85%** had network coverage at least sometimes

*cotrimoxazole, artemether lumefantrine 1x6 and 2x6, ORS

Proposed Solution:
SMS-based system to manage reporting and resupply process: **cStock**

cStock was piloted in 6 districts from July 2011 to February 2013

SC4CCM

cStock: Design

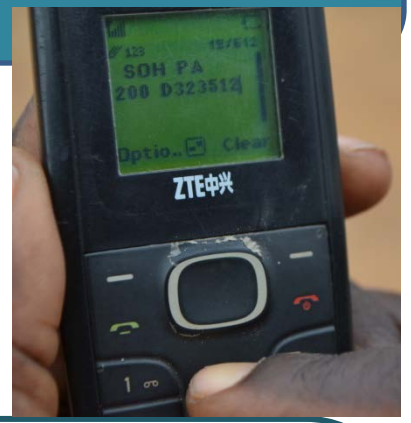
cStock is a RapidSMS, open-source, web-based logistics management information system for community-level health products in Malawi, (CCM, FP and HIV testing).

- HSAs and HC staff use their **personal phones** to report data via SMS on a toll free phone line.

District, Zonal and Central staff access HSA logistics data via **dashboard**

Health Center supplies the HSA based on SMS message

HSA sends SMS with SOH each month



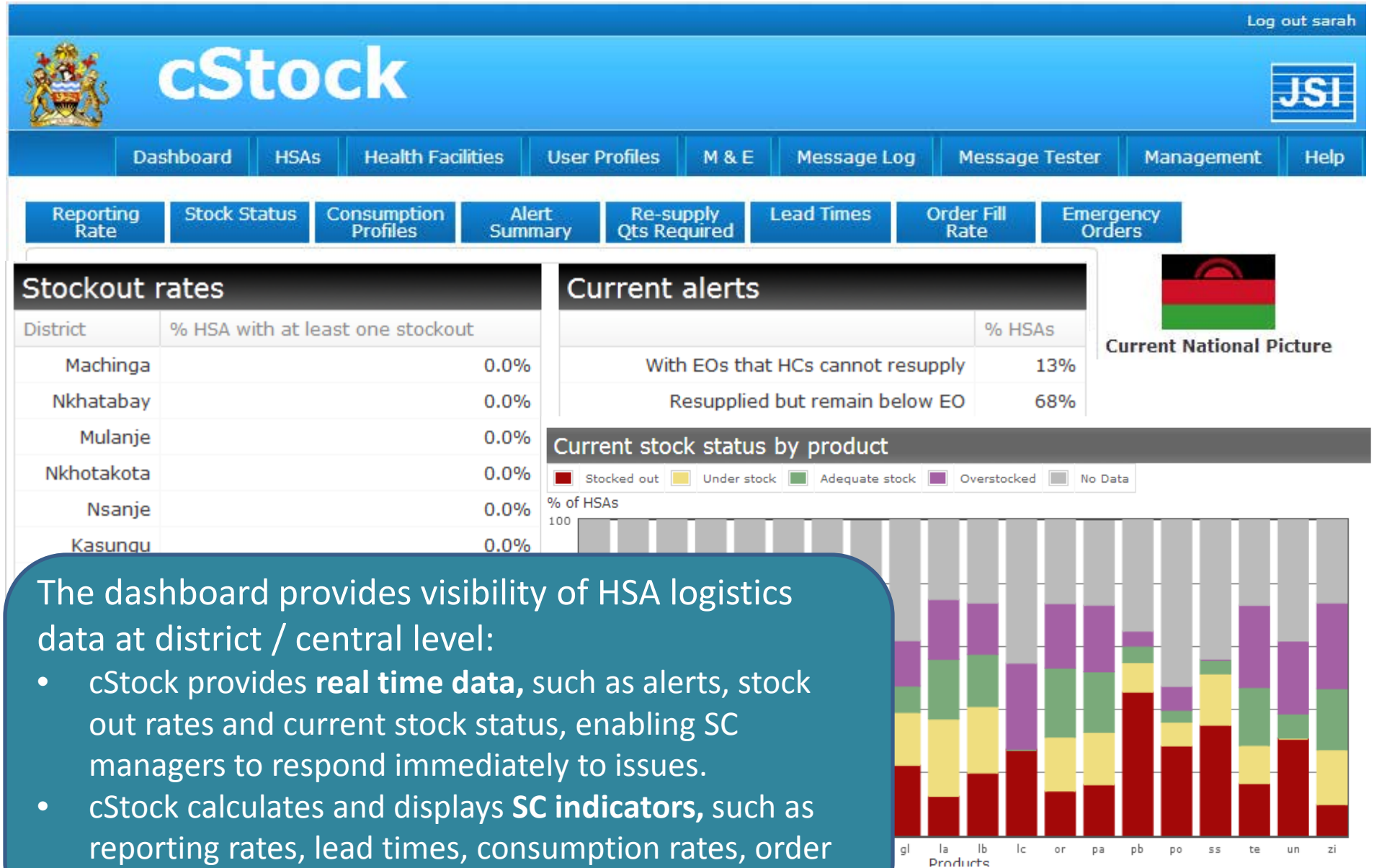
Product Flow

Data Flow

Streamlined resupply process

- **Minimal reporting:** HSA only reports stock on hand and receipts
- **cStock calculates consumption and determines resupply quantities :** System cualculates consumption for individual HSAs based on past reports and determines the resupply quantities
- **No unnecessary travel:** HC receives resupply quantities for each HSA via SMS and notifies HSA either “order ready” or “out of stock”. HSAs only travels if products in stock

cStock: Data Visibility



The dashboard provides visibility of HSA logistics data at district / central level:

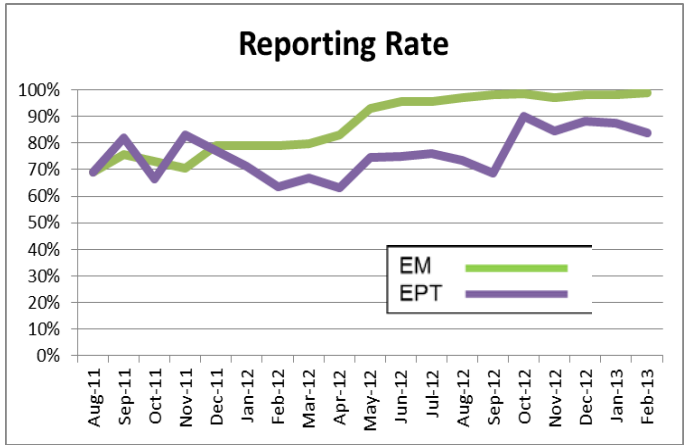
- cStock provides **real time data,** such as alerts, stock out rates and current stock status, enabling SC managers to respond immediately to issues.
- cStock calculates and displays **SC indicators,** such as reporting rates, lead times, consumption rates, order fill rates, for system monitoring and coordination.

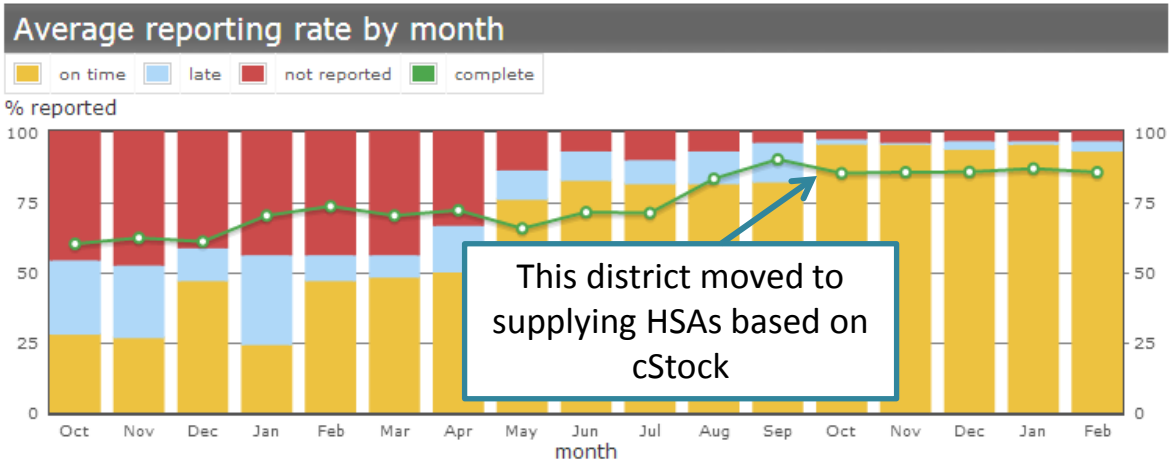
cStock: Midline Evaluation, February 2013

- **Addressing a need: making data visible**
  - Since October 2012 reporting rates in cStock are **consistently above 80%**
- **Efficiency: time to prepare & submit requests and collect products**
  - Majority (56%) said preparing the SMS report took less than 20 minutes, while 92% said the paper report took more than 20 minutes
  - 57% of HC staff report prepacking products prior to HSAs arrival
  - 99% of HSAs found cStock saved them time in collecting products as they are "only forced to travel when our products are ready"
- **Acceptability: Use and trust in cStock**
  - 94% of HSAs primarily use cStock for requesting health products
  - 92% of Drug Store in Charges use cStock to determine the quantities to resupply to HSAs
  - 3 of 6 District IMCI Coordinators said they trust the cStock data more than the paper based reports, 1 of 6 said they trust it equally
- **Accuracy: comparing reported data with records**
  - 93% accuracy comparing qty requested in cStock and qty recorded on resupply worksheet
  - 72% accuracy comparing receipt qty in cStock with qty recorded on the resupply worksheet
- **Communication: linking HSAs to their resupply point**
  - "*We take cStock as a messenger, messenger between HSA and the health center it helps us to reduce mortality rate of under five.*" – HSA, Nkhatabay

cStock: Successes and Lessons Learned

- **Combining an mHealth solution with processes for routine use of data** ensures sustained system use, better performance and managerial oversight
  - In 3 of the pilot districts (EM), District Product Availability Teams (DPATs) were formed linking HSAs, HCs and Districts





- **Linking reporting to resupply results in better reporting rates**

- **Use of personal mobile phones has contributed to rapid scale up of cStock**
  - 20 of the 29 districts (only 6 supported by SC4CCM) in Malawi will be using cStock by end of October 2013, two years since cStock was first implemented
- **A user-centered, iterative and rapid deployment approach** to system development contributed to broad acceptance and use of cStock in Malawi
  - A second development phase during the pilot focused primarily on improving data display on the dashboard and easier to use reports

ODK Scan

Emily Bancroft

Program Director, Health Systems at VillageReach

ODK Scan: Problem Statement

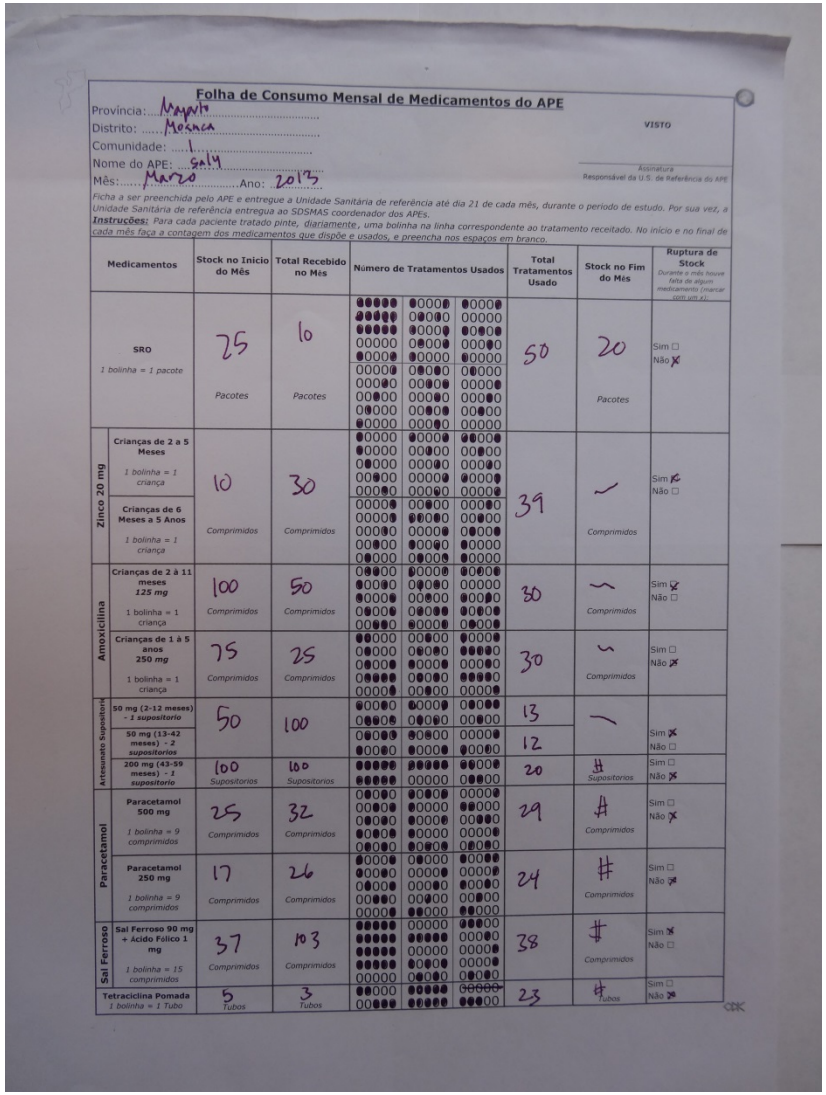
Context

- Paper-Based systems are still the most prolific data collection method in “last mile” environments
- Despite proliferation of digital data collection systems, paper records remain standard practice.
- Is there a way to keep the data on paper, but capture and transmit it with limited burden on the health worker?

Technology

- Android-based technology
- User captures an image of the form using the camera
- ODK Scan processes the data fields and aggregates data to upload into database when connectivity is available
- Currently limited to certain types of data capture (bubbles, tallies, yes/no, multiple choice)

Form Anatomy



Folha de Consumo Mensal de Medicamentos do APE

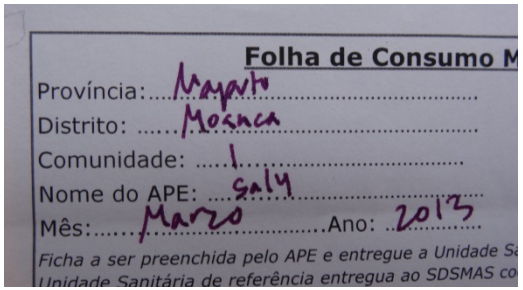
Província: Maputo
Distrito: Moamba
Comunidade: 1
Nome do APE: Sally
Mês: Março Ano: 2013

VISTO
Assinatura
Responsável da U.S. de Referência do APE

Ficha a ser preenchida pelo APE e entregue a Unidade Sanitária de referência até dia 21 de cada mês, durante o período de estudo. Por sua vez, a Unidade Sanitária de referência entregua ao SDSMAS coordenador dos APEs.

Instruções: *Para cada paciente tratado pinte, diariamente, uma bolinha na linha correspondente ao tratamento receitado. No início e no final de cada mês faça a contagem dos medicamentos que dispõe e usados, e preencha nos espaços em branco.*

	Medicamentos	Stock no Inicio do Mês	Total Recebido no Mês	Número de Tratamentos Usados	Total Tratamentos Usado	Stock no Fim do Mês	Ruptura de Stock (Durante o mês houve falta de algum medicamento (marcar com um x))
	SRO *1 bolinha = 1 pacote*	25 Pacotes	10 Pacotes		50	20 Pacotes	Sim ☐ Não ☒
Zinco 20 mg	Crianças de 2 a 5 Meses *1 bolinha = 1 criança*	10	30		39	~	Sim ☒ Não ☐
Zinco 20 mg	Crianças de 6 Meses a 5 Anos *1 bolinha = 1 criança*	Comprimidos	Comprimidos			Comprimidos	
Amoxicilina	Crianças de 2 à 11 meses *125 mg* 1 bolinha = 1 criança	100 Comprimidos	50 Comprimidos		30	~ Comprimidos	Sim ☒ Não ☐
Amoxicilina	Crianças de 1 à 5 anos *250 mg* 1 bolinha = 1 criança	75 Comprimidos	25 Comprimidos		30	~ Comprimidos	Sim ☐ Não ☒
Artesunato Supositório	50 mg (2-12 meses) - *1 supositorio*	50	100		13	~	
Artesunato Supositório	50 mg (13-42 meses) - *2 supositorios*				12		Sim ☒ Não ☐
Artesunato Supositório	200 mg (43-59 meses) - *1 supositorio*	100 Supositorios	100 Supositorios		20	# Supositorios	Sim ☐ Não ☒
Paracetamol	Paracetamol 500 mg *1 bolinha = 9 comprimidos*	25 Comprimidos	32 Comprimidos		29	# Comprimidos	Sim ☐ Não ☒
Paracetamol	Paracetamol 250 mg *1 bolinha = 9 comprimidos*	17 Comprimidos	26 Comprimidos		24	# Comprimidos	Sim ☐ Não ☒
Sal Ferroso	Sal Ferroso 90 mg + Ácido Fólico 1 mg *1 bolinha = 15 comprimidos*	37 Comprimidos	103 Comprimidos		38	# Comprimidos	Sim ☒ Não ☐
	Tetraciclina Pomada *1 bolinha = 1 Tubo*	5 Tubos	3 Tubos		23	# Tubos	Sim ☐ Não ☒



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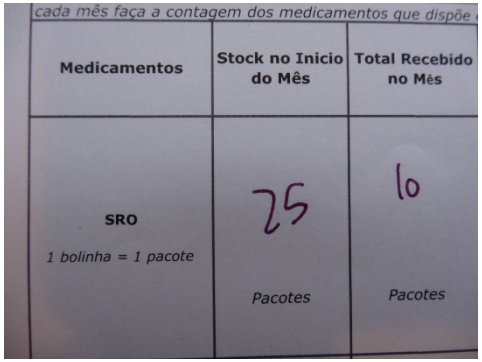

cada mês faça a contagem dos medicamentos que dispõe

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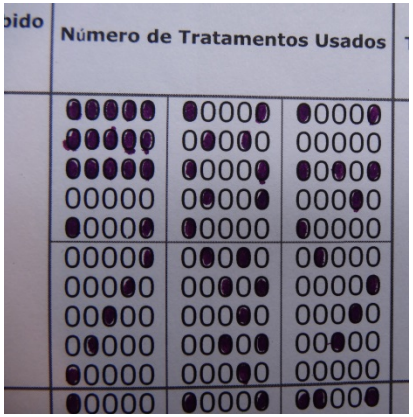
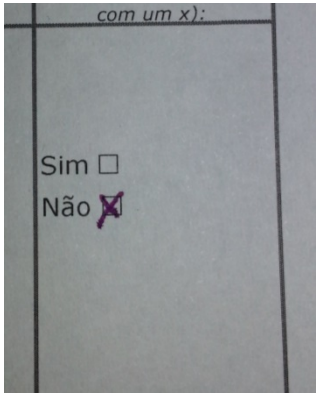
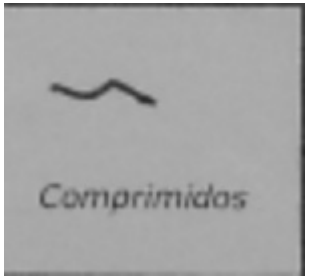


...ido	Número de Tratamentos Usados	



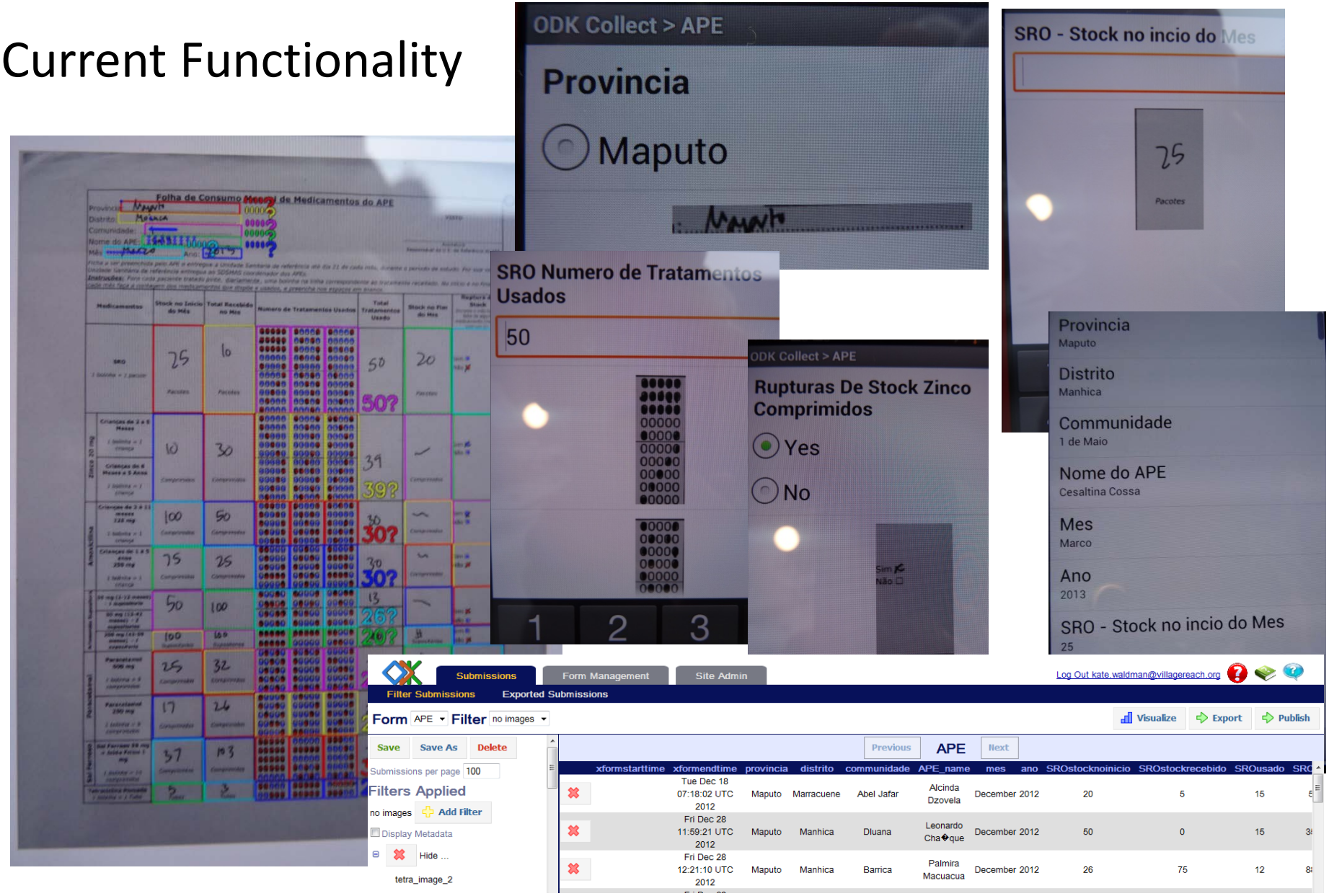
com um x):

Sim ☐
Não ☒



Comprimidos

Current Functionality



Integration of ODK Scan into APE Intervention in Mozambique

Background

- **Goal was to design and pilot community health worker supply chain interventions to address:**
  - Product availability – *do APEs have life-saving drugs when they need them?*
  - Program supply chain visibility – *do partners and stakeholders have the right information at the right time to effectively manage the pipeline of commodities?*
- **Baseline: Challenges for APE Program Logistics**
  - Lack of standardized system for reporting logistics data or resupply
  - Limited APE ability to track data and store commodities properly at their homes
  - General concerns about transport for collection and supervision

ODK Scan as part of a Larger Supply Chain Intervention

- Logistics & resupply process strengthening
  - Designing logistics process job aids and providing basic logistics training
- Storage practice strengthening
  - Providing select APEs with sturdy, secure boxes for commodity storage
- **Improvement of logistics visibility**
  - Designing and training APEs on an adapted logistics report form including consumption data
  - **Providing training and hardware to district supervisors for electronic data capture using ODK Scan**
- Improvement of environment for commodity availability
  - Conducting follow-up trainings and routine monitoring and supervision of the interventions

Conclusions and Lessons Learned

- **Availability of consumption data from APEs is possible with the right training and supervision**
  - Data quantity: 81% submission rate over the project period
    - 68% submission rate when removing incomplete forms (months 4-6 is 72%)
  - Data timeliness: 82% submitted by the 5th of the following month using ODK
    - Note there was no set deadline for the data to be submitted
    - Health worker strike had a clear impact on submission date
  - Data completeness: 85% of submitted forms complete (95% in months 4-6)
  - Data accuracy: 80-85% accuracy on forms that were submitted and complete

- **ODK proved to be a reliable and useful tool that was quick to deploy for submitting data at a district level**
  - Smartphones available and working throughout the project with 1 broken in the last month due to a battery problem
  - District supervisors consistently reported being satisfied with the system, citing the facilitation of electronic form processing and sending
  - 10-13 minutes to process each form
  - All forms processed over 1-2 days
  - More functionality needed to capture numbers and other data points
  - Simplify form as much as possible to reduce errors and decrease completion and processing time

Comparative Analysis

Conclusions

- Paper is easier and cheaper to deploy, but fails to deliver better data utilization benefits over digital
- Digitizing data must improve to displace paper data collection's advantages
- ODK Scan's ease and cost of deployment challenges are likely less than direct digital approaches near term

		Existing approaches that use paper to collect but not digitize data at the service delivery level		Newer approaches that digitize data at the service delivery level	
	Key Comparison Attributes	All paper system with aggregate data sent up to higher levels	Paper with data converted via PC-based data entry at a higher level	ODK Scan	Direct to digital via a mobile device – no paper
Cost and ease of deployment	Physical environment				
	Weak infrastructure	🟢	🟡	🟢	🔴
	Harsh conditions	🟢	🟡	🟡	🔴
	Human environment				
	Weak skill level	🟢	🟡	🟡	🔴
	Time to complete data collection	🟢	🔴	🔴	🔴
	User acceptance	🟢	🟡	🟡	🟡
	Implementation				
	Time to deploy	🟡	🔴	🟡	🟡
	Few dependencies	🟢	🟡	🟡	🟡
	Cost to deploy	🟡	🟡	🟢	🟡
	Ease of deployment	🟢	🟡	🟢	🟡
	Scalability	🟢	🟡	🟡	🟡
	Sustainability	🟢	🟡	🟡	🟡
	Total cost of ownership	🟢	🟡	🟢	🟡
	Leads to form proliferation	🔴	🔴	🟡	🟢
Benefits	Data utilization				
	Breath of access	🔴	🟡	🟢	🟢
	Speed of access	🔴	🔴	🟢	🟢
	Quality	🔴	🟡	🟢	🟢
	Ease of use	🔴	🟢	🟢	🟢
	Portability	🔴	🟢	🟢	🟢
	Versatility (aggregated vs. granular)	🔴	🟡	🟢	🟢
	Empowers workers	🔴	🟡	🟢	🟢

🟢 Strength vs. others 🟡 Neutral vs. others 🔴 Weakness vs. others

mTrac
Information for Better Health

mTrac

Dr Davis Musinguzi

Health Systems Strengthening Specialist at UNICEF Uganda

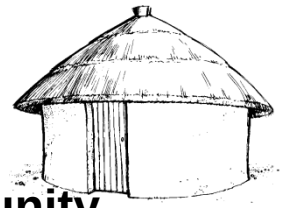
Background

Challenges with HMIS Collection, Analysis, Usage of Data

1. Compliance
2. Timeliness
3. Accuracy
4. Logistics
5. Infrastructure
6. Responsiveness

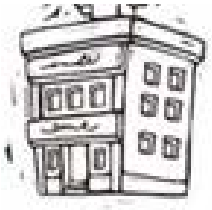
mTrac Objectives

1. To adapt an application for mobile phones to collect routine HMIS data
2. through To strengthen data collection, analysis and usage by stakeholders in the supply chain.
3. To generate greater accountability in supply chain management.



Community

Community Health Worker



Hospital

Information Flow

District Health Office

Ministry of Health

Successes

- All 112 DHTs have been trained and provided the necessary equipment to support mTrac covering over 5000 Units.
- Over 20,000 Health Facility workers have been trained and registered in mTrac.
- Current reporting rates of the weekly HMIS stand at 60-70% of total Health Facilities
- mTrac has contributed to an improvement of facilities without stock outages currently at 88.1% in comparison to 74.8% at the start of the initiative.
- Various departments within the MoH are now using mTrac to communicate to the DHTs and HCs, conduct rapid surveys and polls.
- In 2012, 5472 actionable reports were received through the MoH's anonymous SMS Service Delivery Complaints hotline and nearly 70% successfully resolved.

Lessons

1. The value of multiple stakeholder engagement and government ownership
2. Basing any mobile reporting on existing and up-to-date HMIS tools
3. The value of training District Health Management Teams on ICT
4. Use of SMS Communications, reminders & weekly recognition
5. Engaging technical programs to demand for real time HMIS data through analysis reports for data use
6. Utilising the existing personal mobile phones owned by Health Facility Workers
7. Leveraging Peer (DHT) led Support Supervision for sustainability

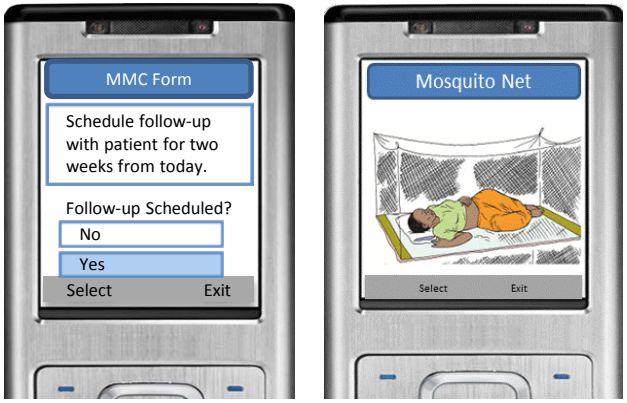
CommTrack

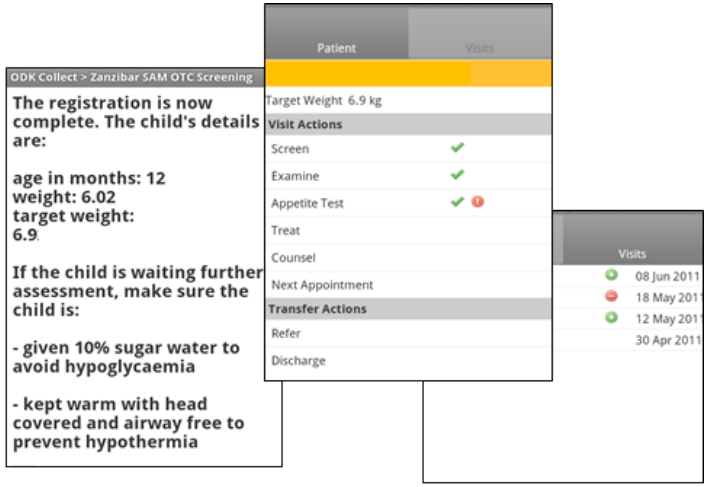
Rowena Luk

VP of Strategy at Dimagi and Product Owner for the CommTrack mobile logistics solution

mHealth, Supply Chain and CCM

- **Dimagi:** providing Open Source mHealth tools and implementation services for more than 130 projects in 30 countries
- **SMS for Logistics**
  - cStock in Malawi: 1800 HEWs –> drives replenishment!
  - mTrac in Uganda: 7059 VHTs, 3000 facilities
  - The Early Warning System in Ghana: 500 facilities
  - ILSGateway in Tanzania: 4,500 facilities
  - UNICEF Bednets: largest campaign of its kind at the time
- **SMS for CCM**
  - ICCM with 150 CHWs in Mozambique and Uganda with Malaria Consortium, including decision support, respiratory rate counter, and stock management
  - CommCare evaluated for C-IMCI in Malawi as part of an RCT by D-Tree International, showing significant improvements in protocol adherence
  - Multi-country C-MAM module being developed by World Vision, deployed by Real Medicine Foundation in India



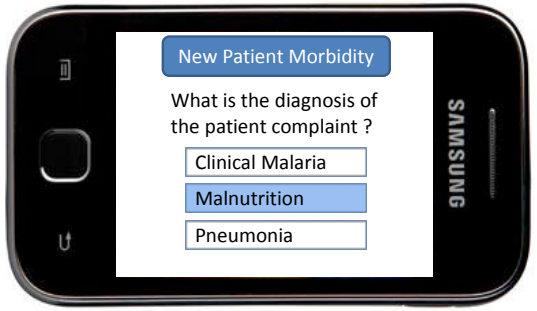


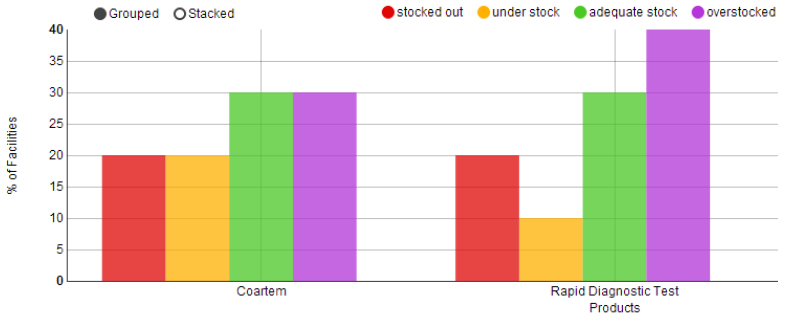
Challenges & Sustainability

- What happens after the project is done?
- Growing pains
  - scale volume
  - scale for different programs
  - scale for organizational change
- Playing nice with other systems
- Duplicate efforts
  - Servers
  - Features
- Identifying local software support
- Fostering a data-driven culture

Our Strategy: CommTrack

- Core, reusable logistics functionality from cStock, ILSGateway, EWS, and mTrac
- Shared resources invested in hosting, support, scale-up, testing, and continuous development
- Easy online signup: get started quickly, learn fast
- Currently in Beta release
  - Deployed: India to track ORS & Zinc at outlets in 14 states
  - Upcoming: Senegal and Nigeria to track family planning commodities, Burkina Faso for CHWs to track malaria commodities
- SMS or Mobile App
  - SMS: Easy, lightweight rollout
  - Mobile App: Integrated approach for CCM: protocol support, respiratory counter, patient follow-up, commodity tracking
- Challenge: ongoing tension between short-term project-specific needs and long-term generic features and authoring tools





Product	Stocked Out	Understocked	Adequate Stock
Coartem	20.0%	20.0%	30.0%
Rapid Diagnostic Test	20.0%	10.0%	30.0%
Sulfadoxine/Pyrimethamine	10.0%	20.0%	40.0%

Summary

- Embedding technology as part of larger system strengthening intervention
- Review other systems and build on them where possible
- Consider affordability and sustainability from the outset
- Focus on core workflows initially, don’t overdesign
- SMS vs. GPRS

Links

- http://sc4ccm.jsi.com/countries/malawi/
- https://confluence.dimagi.com/display/lmis/Lessons+Learned
- http://www.commtrack.org