

# Using DHIS2 to improve stock management?

## DHIS2 and LMIS



dhis2



## Some background:

- LMIS can be considered a domain of its own:
  - Process-oriented: sending orders, distributing medicines, equipment, etc
- Part of this is also used for general health management
  - Are stock-outs affecting our immunization rates?
- At facility level the use of both logistics data and service data is more integrated
  - Do we have enough malaria medicines for next week's expected cases?
- There is thus a natural overlap between HMIS (traditional DHIS2 implementations) and LMIS



# A recurring theme: How can DHIS2 be used as an LMIS?

We do logistics with Excel, can we use DHIS2 instead?

It makes sense to also collect stock data in DHIS2, please advice

Can we link patients in Tracker to the pharmacy?

This country needs an LMIS, do you have examples of using DHIS2 for it?

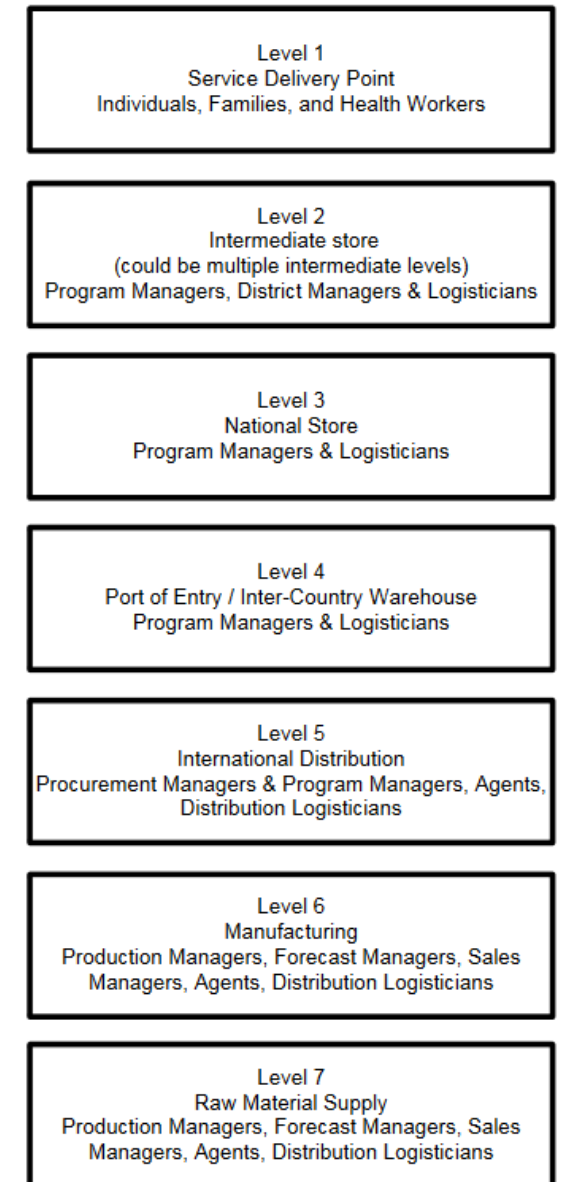
We really need to improve commodity delivery, especially «the last mile»

What is the difference between DHIS2 and OpenLMIS?

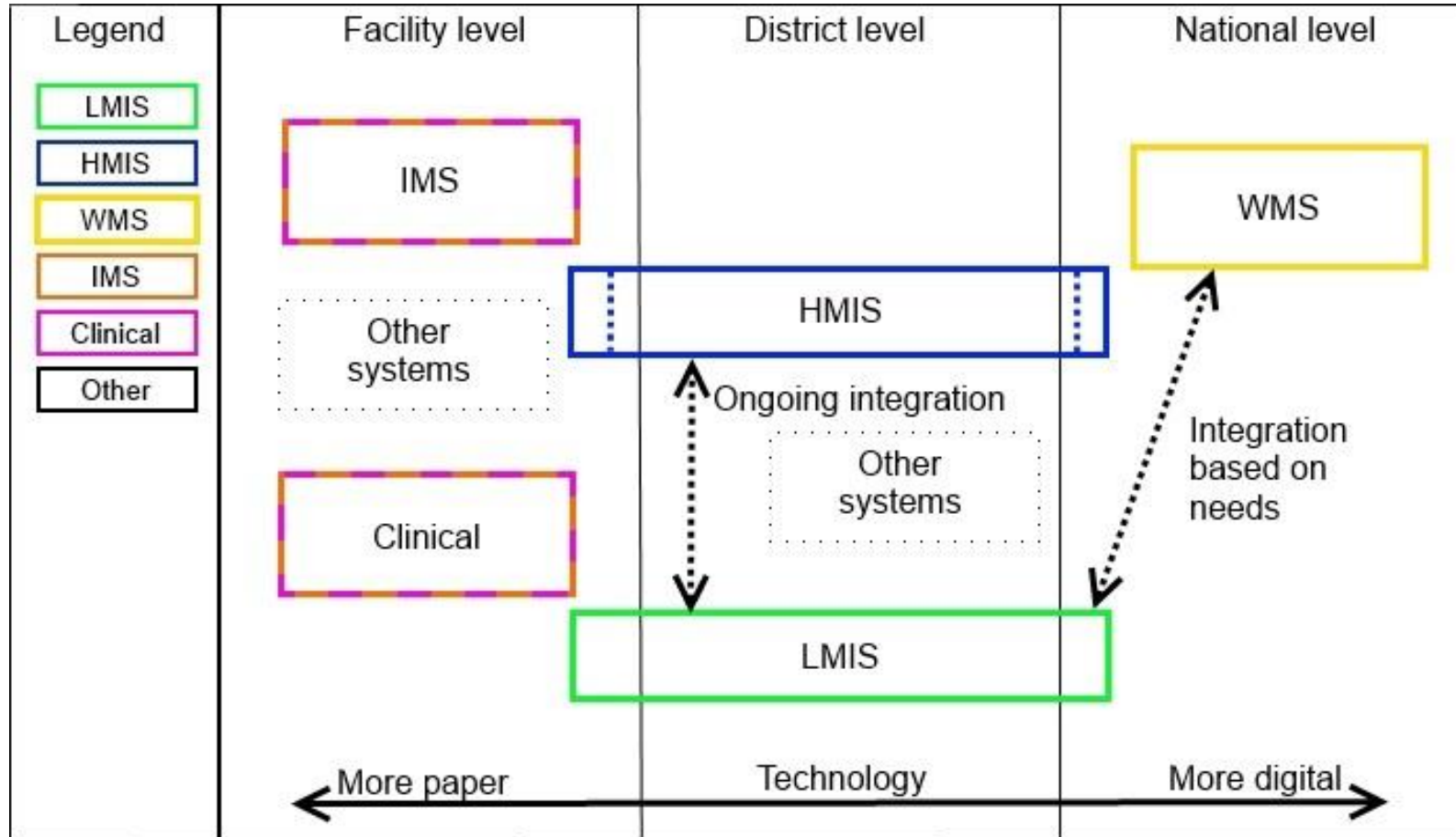
We have a lot of stock-outs, please help!

# A general counter-question: What do you mean?

- LMIS poorly defined. Part of the supply chain
- What information is needed at facility level?
  - What do I have?
  - How long will it last?
  - How much should I order?
- What information is needed at national warehouse level?
  - Where is what needed?
  - How much does it cost?
  - Etc, but also:
    - Which trucks need maintenance?
    - This new, cheaper supplier of drug x, has it been certified?
    - Why is customs clearance taking so long?



# Information systems in national supply chain



Bjørn-Ingar Bergum: Master thesis “Architectural Patterns in the Medical Commodity Supply Chains in Developing Countries - A Collective Case Study of Uganda and Tanzania” 2017



# Facility inventory System?

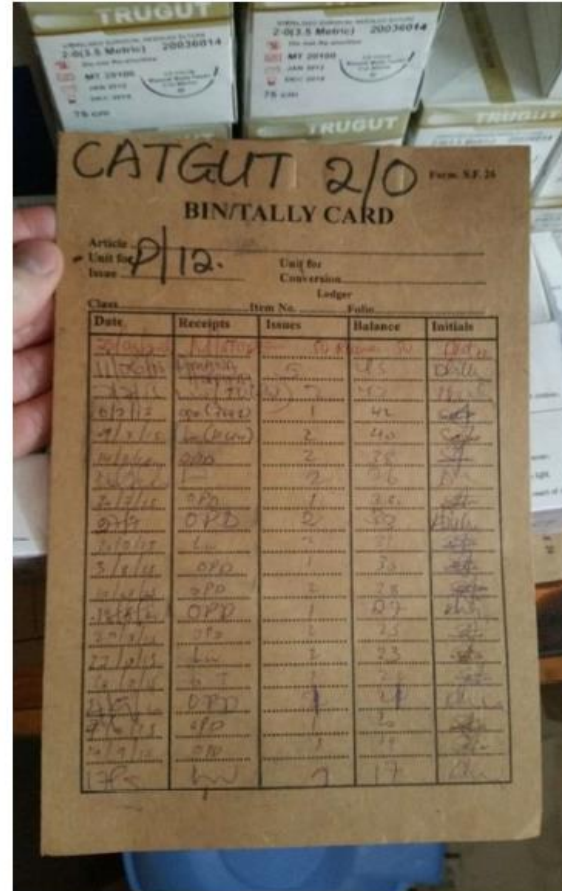


Figure 16 – Pharmacy storage (to the left) and stock card/tally card (to the right)

Marit Kilde Mjelva: Master thesis “Benefits and Challenges of Integrating Fragmented Health Information Systems - A Case Study of the Vaccine Supply Chain in Tanzania” 2017

# Warehouse Management System?

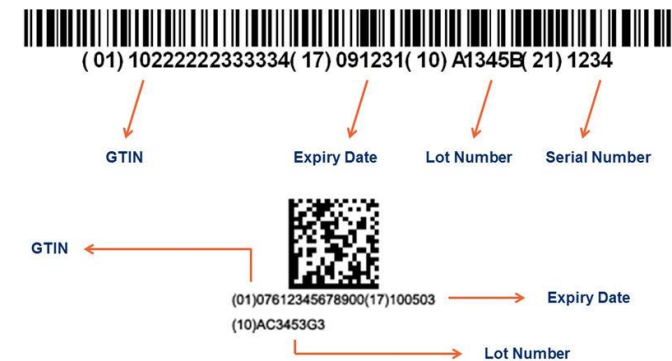
- Central management of sourcing events;
- Real-time, per-transaction stock monitoring;
- Efficient, automated distribution and replenishment orders; and
- Regular assigned alerts on shipment statuses



Photo Credit: USAID Zambia



Photo Credit: USAID Kenya

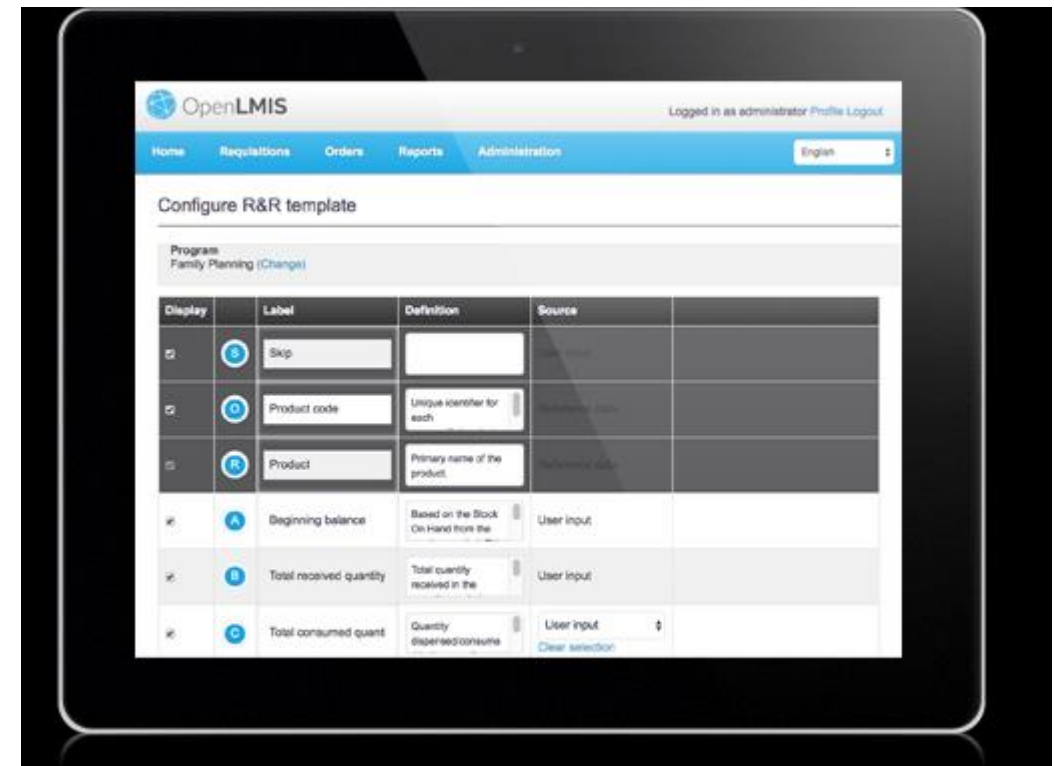




## The in-between: LMIS



Figure 3.2: HMIS worker at Bagamoyo district office entering data from ILS forms into DHIS2



## Beyond binary «DHIS as LMIS – yes or no»

- The central questions:
  - what does it make sense to do with DHIS2, where does this make sense, and where does it make sense to interoperate with other applications and systems?
- Where can we easily improve DHIS2 for supply chain?
  - New indicator calculations? Forecasting etc...
  - «Real-time» budget?
  - Using tracker: Commodity order as tracked entity?

## Trade-offs

- One system/technology vs. Several
- Existing system vs. Completely new
- Scalability vs. Complexity
  - Infrastructure needed
  - Licenses – operating costs, training costs
  - Inventory enough for re-supply vs. Tracking shipment and batches
- No clear answers...

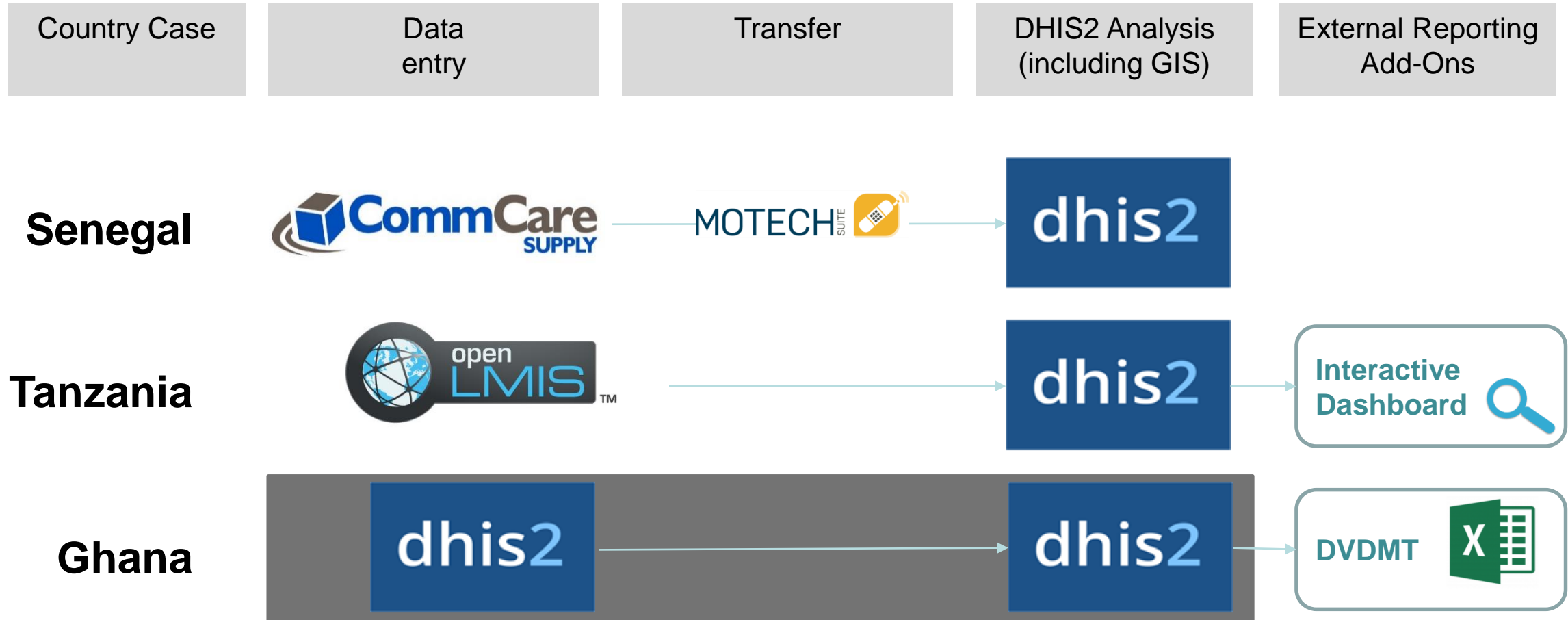
### Feature Table

	CommCare Supply	OpenLMIS	DHIS2
<b>GENERAL</b>			
Configurable Using Administrative Functions	✓	✓	✓
Turnkey Dashboard Management	✓	⊗	✓
Role-based Access Rights	✓	✓	✓
Offline Capability for Specific Functions	✓	✓	✓
Mobile Application for Data Collection	✓	⊗	✓
Interoperable With Other Health and Logistics Systems (ERP, EMR, etc.)	✓	✓	✓
<b>REQUISITION, RESUPPLY, INVENTORY MANAGEMENT</b>			
Manage both Push and Pull Systems	✓	✓	⊗
Submit Requisitions for Approval Electronically	✓	✓	⊗
Approve and Authorize Requisitions Electronically	✓	✓	⊗
Automatic Calculation of Resupply Quantities	✓	✓	⊗
Order Fulfillment and Tracking Through Delivery	✓	✓	⊗
Manage Cold Chain Program, Product & Equipment	✓	✓	⊗
Inventory Management	✓	✓	✓
<b>REPORTING &amp; ANALYTICS</b>			
Aggregate and Visualize Data	⊗	⊗	✓
Analyze Data Using Basic Reporting	✓	✓	✓
Analyze Data Using Pivot-Tables, Dashboards, Charts, and GIS	✓	⊗	✓
Report Inventory Statistics (Stockouts, Consumption) for LMIS Data	✓	⊗	✓
<b>FINANCIAL TRACKING</b>			
Track Financial Data, Facility Budgets	⊗	✓	⊗
<b>SECURITY FEATURES</b>			
Security Control & Enforcement Process	✓	✓	✓

KEY: ✓ - Optimal ⊗ Secondary



# DHIS2 integrating LMIS data



## cStock Integration

- SMS based transactional tracking of community health worker commodities.
  - Calculates resupply
  - CHW supervisors receive automated resupply amounts and fill orders

<https://cstock.baosystems.com/dhis>



## Corner Case with DHIS2

- Enrollment and multistage tracker capture via SMS
- Calculation of key logistics indicators
  - Resupply
  - Stockout rates
  - Reporting rates
  - Stock status – Overstocked, understocked, stockout, or adequate



- Dashboard
- HSAs
- Health Facilities
- User Profiles
- M & E
- Message Log
- Message Tester
- Management
- Help

- Reporting Rate
- Stock Status
- Consumption Profiles
- Alert Summary
- Re-supply Qts Required
- Lead Times
- Order Fill Rate
- Emergency Orders

Site:



Current National Picture

<b>Number Registered</b>	
Districts	29
H facilities	611
HSAs	3749
<b>Reporting Rate</b>	59%

Stockout rates

District	% HSA with at least one stockout
Balaka	37.7%
Blantyre	38.5%
Chikwawa	42.7%
Chiladzulu	36.2%
Chitipa	17.9%
Dedza	81.7%
Dowa	53.7%
Karonga	35.6%
Kasungu	88.2%
Likoma	20.0%
Lilongwe	72.6%
Machinga	46.3%

Current alerts

	% HSAs
With EOs that HCs cannot resupply	3%
Resupplied but remain below EO	74%
With any pending orders	55%
With any pending approved orders	20%

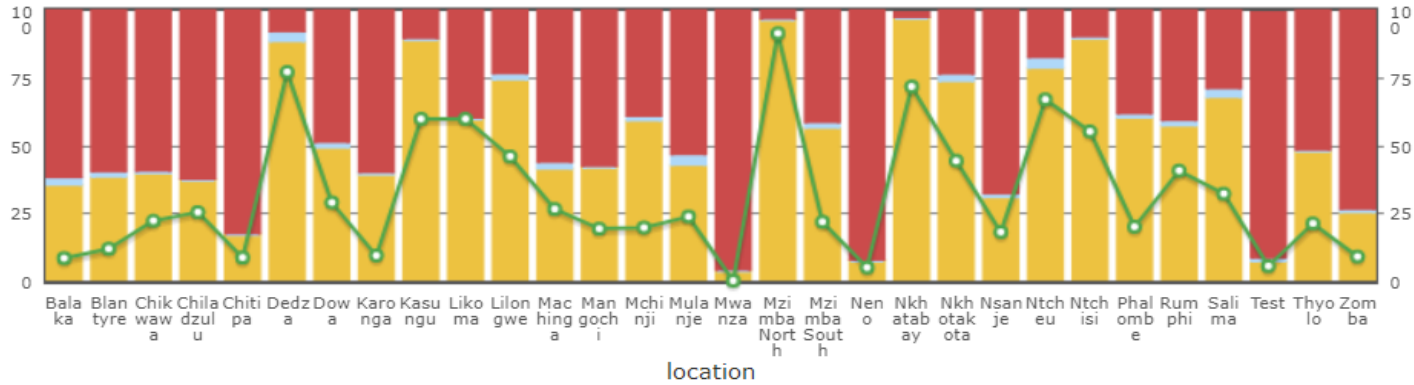
**National Stock Out Rate**

Product	HSAs	% SO
AM	2502	29.3%
cf	960	39.8%
cl	565	26.9%
cm	1487	32.3%
co	1982	18.3%
cw	1216	33.0%
dm	1771	19.6%

### Reporting rates

■ on time 
 ■ late 
 ■ not reported 
 ■ complete

% reported

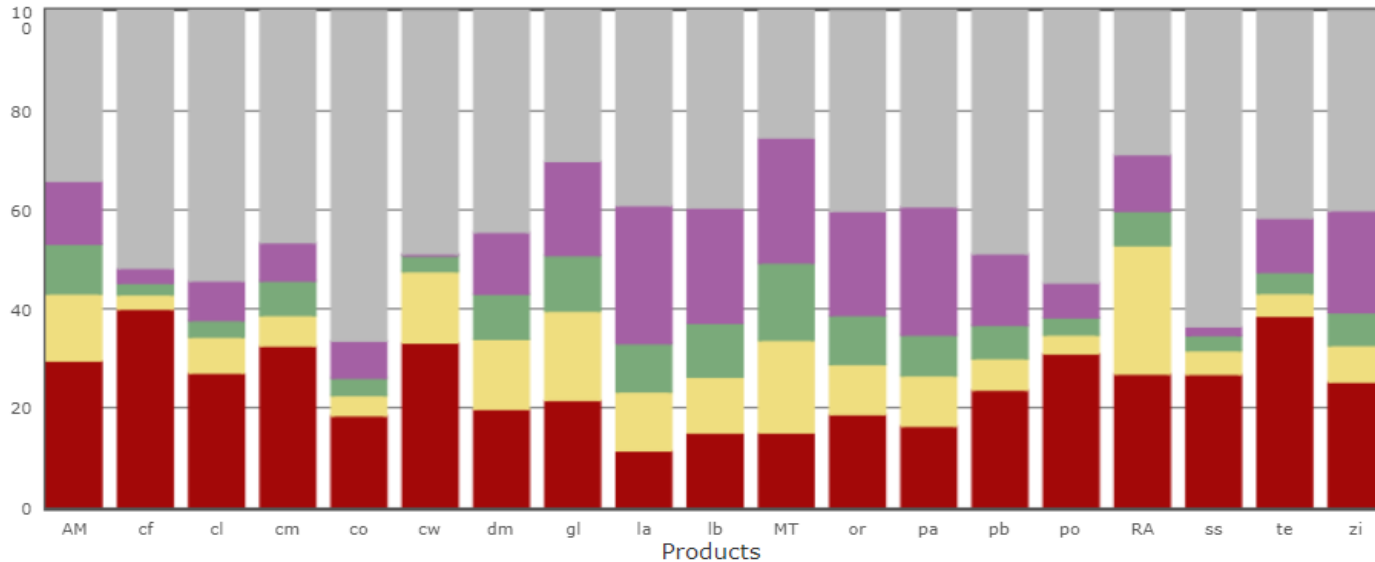


gl	1607	21.4%
la	3514	11.2%
lb	3481	14.8%
MT	2001	14.8%
or	3468	18.5%
pa	3491	16.2%
pb	2701	23.5%
po	468	30.8%
RA	1820	26.7%
ss	229	26.6%
te	3421	38.4%
zi	3459	25.1%

### Current stock status by product

■ Stocked out 
 ■ Under stock 
 ■ Adequate stock 
 ■ Overstocked 
 ■ No Data

% of HSAs



## Integration vs. Interoperability

- Programmatically:
  - cStock must be integrated into the Kenya iCHIS – DHIS2
  - cStock can not introduce a parallel reporting mechanisms
  - cStock must be scalable and generic
  - cStock must be able to be maintained by MoH staff
- Software:
  - DHIS2 tracker can serve as transactional commodity tracer
  - DHIS2 can produce 80% of the necessary indicators – resupply possible with predictor
  - DHIS2 can now capture tracker data via SMS

## So what do we want to invest in?

- Enhancing interoperability technically and documented support
  - Ch 7 of implementation manual
  - CHIS guidelines
  - Updates to the API
- Develop harmonized reporting platform for facility and lower level
  - Clinical service delivery, outreach, iCCM, and logistics
- Continue to develop generic functionalities that can support logistics functionalities