



Global Health

Supply Chain Summit

ABSTRACT # 12

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Data Analytics and Application for Logistics and Supply Chain Management in Zambia's Public Health Supply Chain

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Procurement and Supply Management

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PEPFAR
U.S. President's Emergency Plan for AIDS Relief



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U.S. President's Malaria Initiative

Background

- To identify risk and opportunities for supporting timely action:
 - Very challenging to effectively or manually analyze a high volume of detailed supply chain data.
 - COVID-19 public health restrictions prevent direct oversight at sites.
- Before COVID-19, GHSC-PSM developed ways to work remotely to improve data use within the supply chain.
- **During COVID-19 this work has accelerated and increased its impact** by enabling the Ministry of Health (MOH) and Medical Stores Limited (MSL) to sustain and strengthen their supply chain.

Two examples of advanced analytic tools that support remote supply chain decisions

Stock redistribution tool for operational support



Hub capacity tool for strategic support

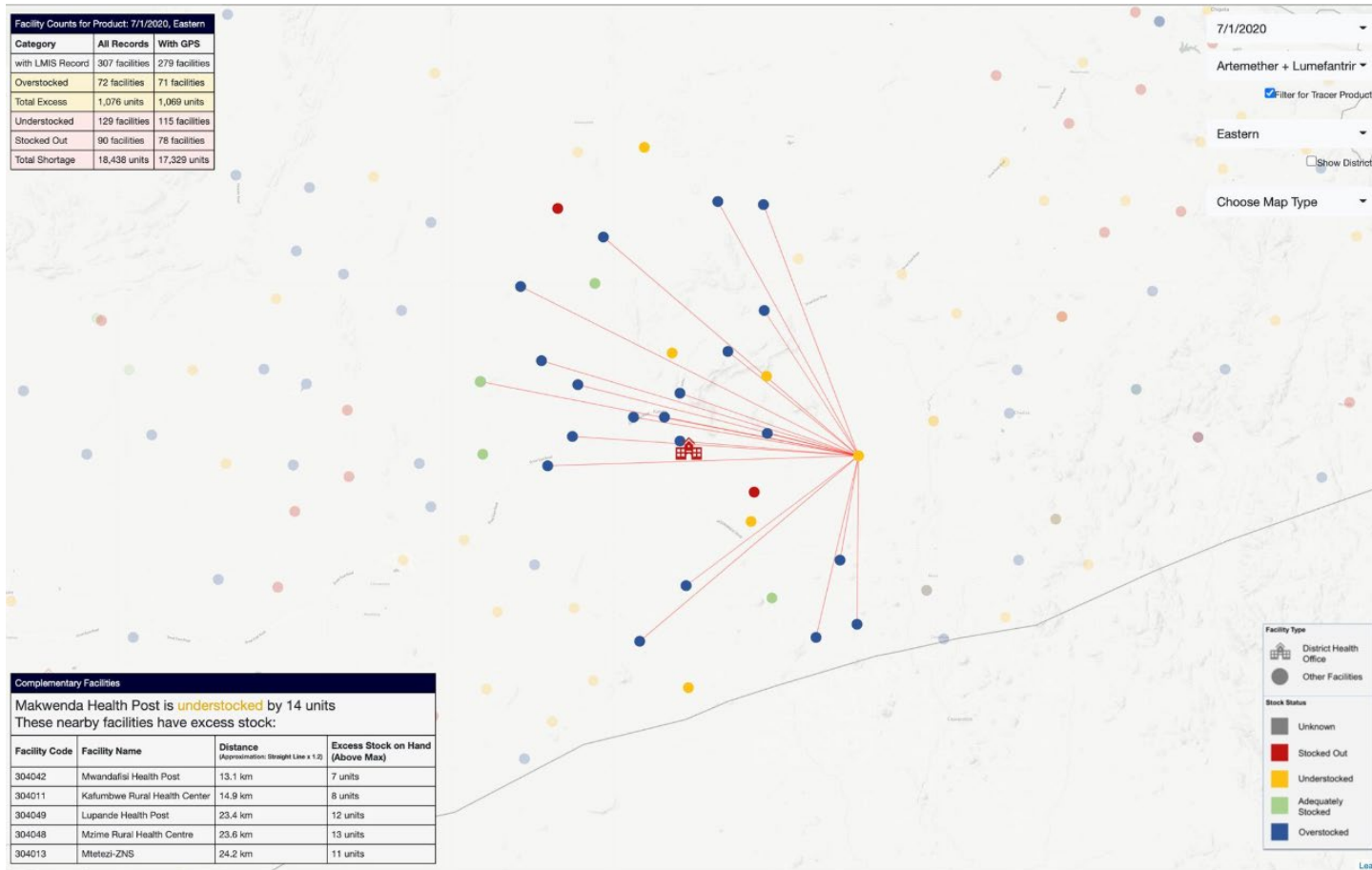


Stock redistribution tool

- With over 2,800 health facilities and hundreds of different commodities, stock redistribution was time-intensive, prone to errors, and likely to overlook redistribution opportunities.
- GHSC-PSM implemented the stock redistribution tool in April 2019.
- Pulls data from the existing eLMIS and automatically analyzes it to identify stock transfer opportunities to support decision-making at provincial health offices (PHOs).
- With intuitive interface, users examine stock status of an entire province or can focus on a specific facility.



A map-based interface for making stock redistribution decisions remotely from any location



The tool uses color-coding and other visual cues to recommend possible transfers to mitigate any facility stockout risk.

How the stock redistribution tool works to ensure a reliable supply to facilities and clients

- Is GIS based.
- Uses eLMIS stock imbalance data.
- Identifies stocked out, understocked and overstocked facilities at the commodity level.
- Shows the quantity by which a facility is overstocked.
- Suggests commodity redistribution from overstocked to stocked out and understocked facilities.
- Estimates distances between facilities.



Results: The tool enabled activities to continue despite reduced physical presence due to COVID-19

- Supported remote decision-making for stock redistribution of all health commodities in provinces to prevent overstock, stockout and expiry.
- From May to August 2020, GHSC-PSM identified and Zambian partners resolved multiple supply risks, including redistribution of:
 - **ARVs, essential medicines, viral load reagents and other lab commodities** in the Western Province
 - **Depo Provera** in Chilanga District
 - **Malaria medicines** in Luangwa District



Hub capacity tool is a medium-term planning (tool) that can support operational roll-out for provincial hubs (RDCs)



- Excel-based analytics tool launched in June 2020 to help Medical Stores Limited (MSL) make strategic decisions about which commodities to store in each provincial hub.
- Aims to reduce the number of commodities managed at the central level and move key commodities closer to facilities.
- MSL will use the tool to determine which commodities should be stored at each provincial hub and in what volumes.

How the hub capacity tool works



- Tool helps determine items to be stocked at provincial hubs, factoring in parameters set by the user:
 - Size of the hub, # pallet positions, inventory rules, facilities served by hub, and priority of commodities to be stored.
- Tool analyzes historical facility order and cubic volume data to determine which commodities can be stored .
- User can adjust the parameters (typically inventory rules) to make final decisions about inventory rules and which commodities will be stored.
- Stakeholders can use insights on hub volume capacity to make decisions on inventory rules, transportation logistics, and ordering processes to ensure the supply chain is working within its capacity constraints.

Key dashboard features

Main page where the user selects the input file, the districts, the number of pallets, and name of the hub with notes.

1) Choose file location

File Location	<input type="button" value="Choose File"/>
C:\Users\ANDREINAROJAS\Desktop\Zambia Hub Analysis\2020-05-01 Cleaned SI Report.xlsx	

This is the total number of pallet spaces available. This determines the threshold for how many products can be added.

2) Choose districts to import

Mark Y where applicable

Province_District	Include?
Central_Chibombo	Y
Central_Chisamba	
Central_Chitambo	
Central_Itezhi-tezhi	
Central_Kabwe	
Central_Kapiri Mposhi	
Central_Luano	
Central_Mkushi	
Central_Mumbwa	
Central_Ngabwe	
Central_Serenje	
Copperbelt_Chililabombwe	
Copperbelt_Chingola	
Copperbelt_Kalulushi	
Copperbelt_Kitwe	
Copperbelt_Luanshya	
Copperbelt_Lufwanyama	
Copperbelt_Masaiti	

The user can select which Provinces and districts to import into the tool.

3) Enter number of pallet spaces

17000

4) Name of hub and/or notes

Name:

Notes:

These fields allow the user to name the hub and/or add any notes to the analysis produced. The user can then save a new version of the tool with the past hub analysis for reference.

5) Import LMIS Data

LMIS file selected needs to match the columns and the column order in the LMIS Data tab

The input template can be found in the "LMIS Data Template" tab.

Other key dashboard features

The “All Products Analysis” tab contains the output of the analysis. The Product Details at the bottom of the page show the product information.

The user can override the Unit Per Pallet information for any given analysis. By clicking “Save User Override,” the user can save this new cubage information as “Cubage Confirmed with SME” for future versions.

The user can exclude products from being added into the pallets.

Product Detail

Save User Override

Product Code	Product Description	Program ?	Group	Rank	eLMIS AMC to facilities	Units Per Pallet from Various Sources					Final Units Per Pallet	Source	Space Used (IMOS)	Desired MOS	Space Used (Selected MOS)	Space Used Iter Accounting For Buffer (see TLD/TLE analysis)	Cumulative Pallets	Exclude Product in Pallets? (Y)
						Cubage Confirmed with SME	Top 300 Cubage Analysis	Master Product Data	PSM Freight Estimator	User Override								
/ ARV0043	Lopinavir/Fitonavir (Kaletra), Tablet 100/25 mg	Y	A	1	14,264						None Available	0	2.00	0.0	0.0	0		
2 ARV0080	Tenofovir/Alafenamide/Emtri citabine/Dolutegravir Tablet 25/200/50 mg	Y	A	1	9,702						None Available	0	2.00	0.0	0.0	0		
2 ARV0061	Abacavir Sulphate 120mg + Lamivudine 60mg Tab (30) Tablet 120/60 mg	Y	A	1	9,217						None Available	0	2.00	0.0	0.0	0		
4 HTK0002	Determine HIV 1/2 Rapid Test Ine Chase Buffer Device NA IU	Y	A	1	8,338	2.00000	451	288			2	Cubage Confirmed with SME	4169	2.00	8338.0	8338.0	8,338	
5 RH0004	Ethinylestradiol/Levonorgestrel 130mg/150mcg tablets Tablet 0.030,15 mg	Y	A	1	7,051		6,475	151,200			6,475	Top 300 Cubage Analysis	1	2.00	2.2	3.0	8,341	
6 ARV0065	Tenofovir/Lamivudine Tablet 300/300 mg	Y	A	1	6,972		3,074	2,268			3,074	Top 300 Cubage Analysis	2	2.00	4.5	5.0	8,346	
7 RH0023	Medroxyprogesterone Acetate, 150mg, Injection - -	Y	A	1	6,325		3,460	480			3,460	Top 300 Cubage Analysis	2	2.00	3.7	4.0	8,350	
8 ARV0018	Lopinavir/Fitonavir Tablet 200/50 mg	Y	A	1	5,616		2,606	1,824			2,606	Top 300 Cubage Analysis	2	2.00	4.3	5.0	8,355	
9 MAL0061	Rapid Diagnostic Tests For Malaria (P Falciparum) Each Each each	Y	A	1	5,000		918				918	Top 300 Cubage Analysis	5	2.00	10.8	11.0	8,366	
10 MAL0015	Rapid Diagnostic Test for Malaria, Other each	Y	A	1	4,827		918	704			918	Top 300 Cubage Analysis	5	2.00	10.5	11.0	8,377	
11 ARV0032	Tenofovir/ Emtricitabine Tablet 300/200 mg	Y	A	1	4,505							None Available	0	2.00	0.0	0.0	8,377	
12 ARV0048	Zidovudine/Lamivudine Tablet 30/60 mg	Y	A	1	4,297		3,207	2,592			3,207	Top 300 Cubage Analysis	1	2.00	2.7	3.0	8,380	

Main

All Products Analysis

Cubage Confirmed with SME

LMIS Data

Master Product Data

Top 300 Cubage

Freight Estimator Cubage Data ...

Results: How MSL has used the hub capacity tool in Zambia



- Completed an analysis of the most commonly distributed products and found 40 SKUs represented 80% of orders.
- Using inventory targets (1-2 MOS), monthly distribution data from eLMIS, and physical storage spaces at hubs, identified 14 SKUs to be wholly managed by the provincial hubs.
- Based on the findings of the analysis in June, GHSC-PSM and stakeholders **agreed to store 15 of the 40 potential commodities at the Luanshya Hub (Copperbelt Province)**, allowing MSL to refine their distribution strategy for this province.
- From this strategy and the data extracted from the tool, MSL have been able to identify how they want to use their ERP system (some orders being directed to the hubs others going to the central warehouse).

Conclusions

- Replaces time-consuming, manual processes.
- Allows speedy action to prevent supply risks.
- Prevents COVID-19 pandemic from impeding technical support.
- Shows that technical support can be provided remotely long-term.
- Due to the built-in flexibility, adapts easily to other countries' data, especially those using the OpenLMIS platform for eLMIS.





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