





TECHNICAL BRIEF

**APRIL 2020** 

# SCALE UP OF RXSOLUTION eLMIS IN UGANDA

## BACKGROUND

An efficient commodity supply chain is the cornerstone of a well-functioning health system. To ensure an uninterrupted supply of essential medicines to clients, decision makers need to have visibility into inventory of health commodities up and down the supply chain. An electronic logistics management information system (eLMIS) provides better data visibility into the supply chain, enabling data-driven decisions that lead to improved commodity availability and patient health care outcomes.

Before 2010, health supply chain managers in Uganda were unable to effectively monitor stock management in health facilities. A lack of reliable and timely data for evidence-based decision making was a contributing factor. The logistics management systems at public health facilities were paper based and had limited capability for data analysis. Without tools to track, analyze, and manage stock information, it was difficult to prevent stock-outs, overstocks, and expiry of medicines. This led to a persistent problem of inadequate supply of essential medicines and supplies in the health facilities.

Recognizing this challenge, the Uganda Ministry of Health (MoH) embarked on a program to improve the capacity and performance of health facilities in inventory management. In 2010, the MoH chose R×Solution, an integrated pharmaceutical management software, to automate inventory management in high-level public and private not-for-profit (PNFP) health facilities in the country.

RxSolution is an eLMIS developed with support from the US Agency for International Development (USAID). It is freeware developed in South Africa by pharmacists<sup>1</sup> with experience implementing stock solutions in low-

resource settings. The system supports best practices for procurement, storage, and dispensing of medicines and health supplies and is specifically designed to manage medicines and health supplies from start to finish, from the planning stages of procurement to the moment the product is given to the patient.

The software has the following modules:

- A medicines product catalog
- Procurement and ordering
- Receiving
- Requisition and issuing
- Stock taking
- Patient registration
- Prescribing
- Dispensing
- Reports

Additional innovations implemented for the R×Solution roll out in Uganda include:

- A centralized medicines and health supplies product catalog, electronic ordering from PNFP facilities to the Joint Medical Store
- An automated system installation package (RxBox)
- Real-time data synchronization to the MoH Pharmaceutical Information Portal (PIP) data warehouse for stock status reporting
- Enhancement of reports in R×Solution to fit the Ugandan setting

Figure I shows the RxSolution modules and the innovations added for Uganda. The majority of health facilities where RxSolution has been implemented are using only the inventory management modules, but a small number also use the patient management and dispensing modules.

RxSolution overview. Available at http://siapsprogram.org/tools-and-guidance/rxsolution/ USAID Systems for Improved Access to Pharmaceuticals and Services



Figure 1: RxSolution software modules and innovations added for Uganda

## IMPLEMENTATION APPROACH

RxSolution was selected by the MoH Pharmacy Department and Division of Health Information after a review of 16 other pharmaceutical inventory management tools to support computerization of medicines management in Uganda. The software was selected for its end-to-end functionality, from ordering and receipt to requisitioning, issuing, prescribing, and dispensing, in one integrated package. It was piloted in 2011 in Butabika National Mental Referral Hospital, Masaka Regional Referral Hospital, and Kayunga General Hospital. Scale up of RxSolution throughout the country started in 2014, with substantial roll out in 2015 and 2016. The reports in RxSolution were enhanced to better fit Uganda's health facility operation and reporting requirements. These included ordering, stock status, expiry, audit, redistribution, and national health management information system reports. The USAID-funded Uganda Health Supply Chain (UHSC) project, implemented by Management Sciences for Health (MSH), led the roll out of RxSolution in the country in collaboration with the MoH and partners. Scale up of RxSolution across the country was achieved through collaboration with health partners working in the different regions of the country who supported and participated in the roll out. Ongoing support for RxSolution in health facilities has been transitioned to these regional partners with MoH oversight.

## RESULTS AND ACHIEVEMENTS

As of 2019, RxSolution had been installed in the stores of more than 270 health facilities across the country. All of these facilities synchronize with a centralized medicines and health supplies product catalog and have been set up to automatically submit data to the MoH PIP system for stock status reporting. This has improved access to realtime data and reduced the time it takes for health facility information to reach the MoH. Before RxSolution, these facilities only submitted monthly stock data on 41 tracer commodities through the MoH DHIS2 health management information system, but RxSolution provides real-time data on approximately 300 commodities for connected facilities. RxSolution has also increased health facility efficiency in inventory management through automated generation of inventory reports and provides visibility into commodity wastage due to expiries and overstocks, which has contributed to corrective actions at the national and subnational levels to ensure optimal availability of commodities.

Aggregate reports and dashboards for data from RxSolution sites across the country were developed in the MoH PIP data warehouse system to provide supply chain insights to managers at different levels. The reports are automatically shared routinely by email to various health supply chain stakeholders to provide insights into commodity security at the facility level. Figure 2 shows a sample of the expired items dashboard, while Figure 3 shows a sample of the short dated items' drillable aggregate report.



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#### Figure 2: Sample of the RxSolution expired items dashboard in the Ministry of Health PIP data warehouse

#### Figure 3: Sample of the RxSolution aggregate short dated items report in the PIP

#### M.O.H Business Intelligence Center > REPORTS > RXSOLUTION Reports

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PHARMACEUTICAL INFORMATION
PORTAL. [ PIP ]
Data Source: RxSolution Health Facility Inventory Dat

#### Health Facility Short Dated Items (< 2 Months to Expiry)

#### Ministry of Health

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Pharmacy Division

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Reg	jion D	istrict	Facility	Expiry date	Cost	Code	Product Description	Quantity in Stock
Central	entral 🗉	Buikwe	Kawolo general hospital		2,780,788 UGX			
			Total Cost		2,780,788.34 UGX			
	E	Bukomansimbi	🗉 Butenga health center IV		3,645 UGX			
			Total Cost		3,645.31 UGX			
	E	Butambala	Gombe general hospital		329,120 UGX			
			Total Cost		329,119.57 UGX			
		Gomba	🗆 Maddu health center IV	31-05-2020	0 UGX	220939	Rifampicin(R),Isoniazid(H) 75/50mg(Tablet-Comb.)[28 Blister]	3
				31-05-2020	0 UGX		HIV test kit Determine+Chase buffer ()[100 Tests]	22
				31-05-2020	0 UGX	223023	Pethidine 100mg/2mL(Injection)[1(100mg) Ampoule] (PREPACKED)	65
				31-05-2020	11,340 UGX	220470	Phenobarbital (Phenobarbitone) 30mg(Tablet)[1000 Tablet]	3
				30-06-2020	0 UGX	OTHS0278	Hepatitis B Surface (HBSAG) Test Strips ()[50 Tests]	1
				30-06-2020	0 UGX	220870	Rifampicin(R), Isoniazid(H), Pyrazinamide(Z), Ethambutol(E) 150/75/400/275mg(Tablet-Comb.)[24(672tab) Blister]	1
				30-06-2020	0 UGX	215135	Diazepam 10mg/2mL(Injection)[1(10mg) Ampoule] (PREPACKED)	70
				30-06-2020	0 UGX	224915	Tenofovir/Lamivudine/Efavirenz (TDF/3TC/EFV) 300/300/600mg(Tablet-Comb.)[30 Tablet]	832
				30-06-2020	4,647 UGX	205045	Salbutamol 100mcg/Dose 200 Dose(Inhalation) [1(200Dose) Bottle]	6
					15,987 UGX			
			Total Cost		15,986.87 UGX			
	Ð	Kalungu	Bukulula health center IV		200,811 UGX			
			Total Cost		200,811.41 UGX			

Finally, the complete suite of functionality of R×Solution, from stock management to patient registration, anthropometry, vital signs, history, and laboratory results data capture, plus digital prescribing and dispensing, was set up at Makerere University Hospital. The hospital was set up as a model site to show the full capabilities of R×Solution software and to demonstrate requirements for achieving end-to-end traceability of medicines from supplier to patient.

## LESSONS LEARNED

Some of the key lessons learned during scale up of the R×Solution eLMIS in Uganda include:

- A policy shift to eliminate paper-based inventory management is required to ensure optimal use of the eLMIS
- Scale up should be achieved in incremental phases to be most effective
- A harmonized product catalog is essential for use across all health facilities that are using the eLMIS
- The eLMIS should primarily be used for day-to-day commodity management operations of the health facility and not simply as a reporting tool
- Most data use in the health facility should be at the source from which the data are generated to support commodity use, management, and availability and then additionally at higher levels
- Reports should be action oriented to inform timely operation and strategic decision making
- System development on a web-based platform would ease maintenance and system upgrades in facilities across the country vis-a-vis the current standalone application architecture of the system
- Collaboration with other partners during scale up is beneficial for all. Collaboration provides for shared costs, faster scale up, and greater reach and fosters a sustainable support structure

## WAY FORWARD

An upgrade of RxSolution to a web-based platform is required for easier maintenance of the system. Interoperating RxSolution with other facility systems and supplier warehouse systems is also required to allow for data sharing and to minimize dual data entry in systems. Full capacitation of the MoH and partners to comprehensively support RxSolution is essential for system sustainability.

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This publication was made possible by the generous support of the American people through the President's Emergency Plan for AIDS Relief (PEPFAR) and the US Agency for International Development (USAID) under the terms of cooperative agreement number AID-617-A-14-00007. The contents are the responsibility of the authors and do not necessarily reflect the views of USAID or the US Government.







