



Orientation of focal persons from the National Medical Store and Joint Medical Store during the launch of the Warehouse Online Stock Status Report dashboard.



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THE REPUBLIC OF UGANDA



## USAID/Uganda Strengthening Supply Chain Systems (SSCS) Activity

# IMPACT STORY

August 2024

## Enhancing supply chain decision-making through real-time data analytics in Uganda

### Background

Data drives health system efficiency – improving access to health services, streamlining service delivery, and enabling informed decision-making for appropriate resource allocation and patient care. In line with Uganda’s National Development Plan III 2020/21–2024/25 the Ministry of Health’s (MoH) Strategic Plan 2020/21–2024/25 and the Health Information and Digital Health Strategic Plan 2020/21–2024/25, Uganda uses data from various systems including the National Medical Stores (NMS) warehouse Enterprise Resource Planning system and health facility District Health Information System (DHIS2) platforms to track and monitor central- and site-level commodity status.

To generate central-level stock status information, the MoH Department of Pharmaceuticals and Natural Medicines (MoH/DPNM) would manually analyze health commodity stock data submitted monthly by the central warehouses, i.e. NMS and the Joint Medical Store (JMS), producing a bimonthly stock status report in MS Excel. This report tracked two indicators, stock on hand (in months) and stock projection (entailing pipeline and expected stock status), and was disseminated to stakeholders at various technical working group meetings e.g. Commodity Security Group (CSG) and the Medicine Procurement and Management (MPM) and via email.

In addition, prior to March 2023, the MoH/DPNM would manually extract monthly commodity data, reported by 4,000 health facilities in DHIS2 since 2011. This data would be processed using MS Excel generating a bimonthly facility stock status report that provided a sub-national stock picture. This was disseminated primarily via email to selected stakeholders at both national- and sub-national level. These included representatives from ministries, department and agencies (MDAs), district health teams; and development and implementing partners.

Although stock status data was available through the two reports highlighted above, its use for supply chain decision making and action remained inadequate due to the reports' limitations; for example, the bimonthly nature of the reports led to obsolete information when shared; the target group of stakeholders was based only on known emails (approximately 120) and sometimes nonfunctional emails; and software compatibility issues included old versions and large file sizes. This prompted the development of online dashboards with automated analytics, real-time availability, visibility, and dissemination of the stock information and performance indicators for stakeholder use across the national health supply chain ecosystem.

The MoH's DPNM and Division of Health Information with support from the USAID Strengthening Supply Chain Systems Activity (SSCS) and USAID Strategic Information Technical Support (SITES)/Data Care (U) Ltd., developed online stock status dashboards including the Warehouse Online Stock Status Report (WOSSR) and the Online Facility Stock Status Report (OFSSR), to enhance automated supply chain data analytics for decision making to achieve sustainable end-to-end supply chain visibility and data access.



“ From the Warehouse Online Stock Status Report (WOSSR) I access information on commodity stock status, items at risk of expiry, pipeline quantities of various health products, all at a click of a button. I access this information as deemed necessary but at least quarterly.

The tool provides real-time data on the relevant parameters of the health products such as on-time in full, which informs the Global Fund Local Fund Agent (LFA) on performance of the Procurement Services Agents. We are also able to access previous data and performance trends. — *Peace Kabagambe, Pharmaceutical Management Advisor, Global Fund LFA*

“ The WOSSR provides information on central warehouse stock status, near expiries, and shipments/planned pipeline. This information is accessed weekly.

We now depend on it as a source of critical central-level stock status and pipeline information, which eases our engagements with the implementing partners and technical/program team members. — *Peter Niwagaba Program Management Specialist - Supply Chain Office of Health & HIV/AIDS, USAID/Uganda*





## Approach

The WOSSR was developed by pulling data from the National Health Data Warehouse (NHDW) to create a one-stop, web-based reporting portal to track the central-level stock status of essential medicines and health supplies in Uganda. Data obtained from NMS and JMS are collated and uploaded to the portal via a semi-automated process at the MoH. The early version of the dashboard, developed and rolled out in 2019, lacked some system feature functionality with limited product scope, and hence its access and use was sub-optimal from 2020-2021 with an average of 5 accounts utilizing the system 36 times per month. In January 2022, an upgrade of the WOSSR dashboard began as illustrated in Figure 1. Enhancements involved mapping and increasing commodity product scope, development of wireframes to visualize the final system output, establishment of institutional access accounts, and introduction of additional supply chain indicators such as on-time in full, commodity availability, and remaining shelf life.

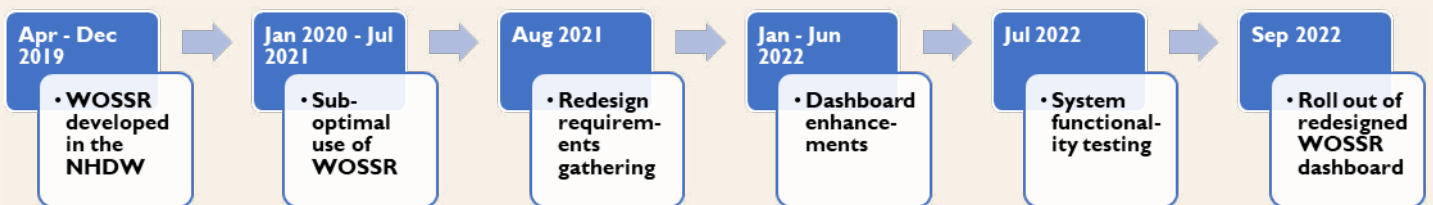


Figure 1: WOSSR Implementation Journey

The OFSSR dashboard was developed following five phases: requirements gathering, prototyping, agile development, user-acceptance testing, and rollout as illustrated in Figure 2.

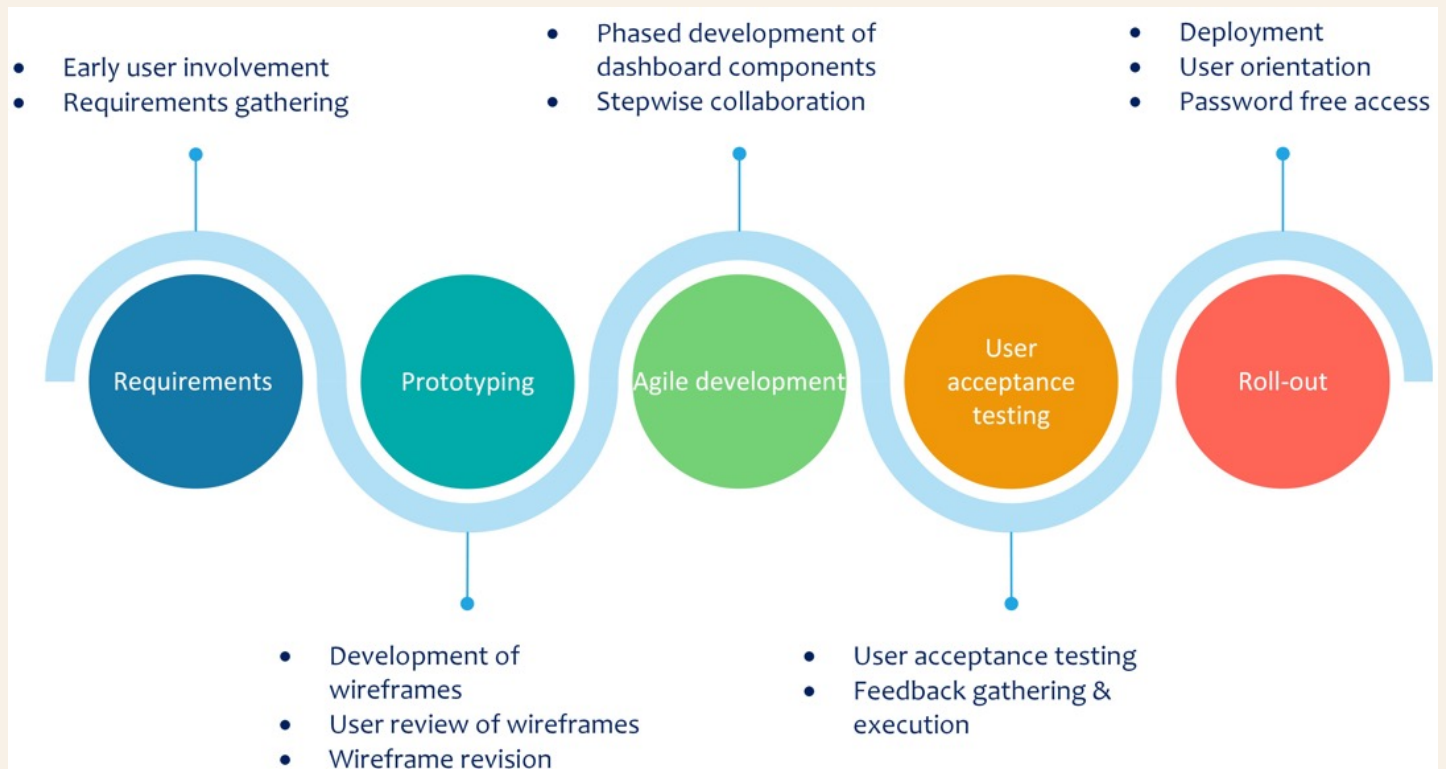


Figure 2: Steps to develop the OFSSR dashboard

# Results

## A. WOSSR

### 1 Institutional access

To increase access to the dashboard, 43 institutional access accounts were given to central-level stakeholders. The institutional accounts offered consistent access across team members. Relatedly, a QR code provided to each stakeholder offered a secure, efficient, and convenient way for users to quickly authenticate and gain access to the dashboard by eliminating manual login processes. This approach helped improve access as demonstrated by the user statistics below.

### 2 Increased commodity scope

Before the redesign, the WOSSR dashboard had 6 commodity baskets and tracked data on 41 tracer items out of the 3,000 health commodities available in the monthly warehouse reports. Following the redesign phase, an additional 8 baskets were added with 300 products tracked (Figure 3). With an increased commodity scope, users gained access to stock information for a broader range of pharmaceuticals.

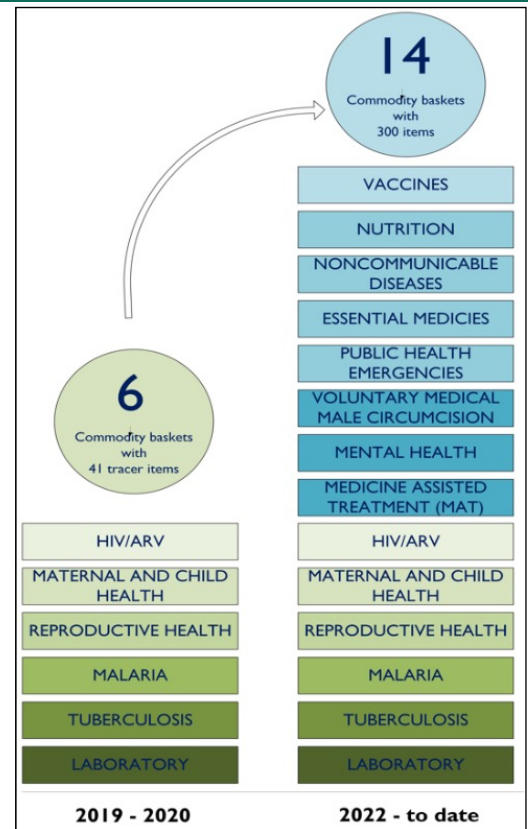


Figure 3: WOSSR commodity scope

### 3 Improved system features

The WOSSR dashboard was enhanced with features such as custom reports, system-generated on-time in full, export in various formats (PDF, Excel), and categorization of expiry. These additions have allowed users to tailor data analysis to their specific needs and receive timely availability of accurate data critical for optimizing inventory management. Figures 4a, 4b, and 4c display some of the system's features.

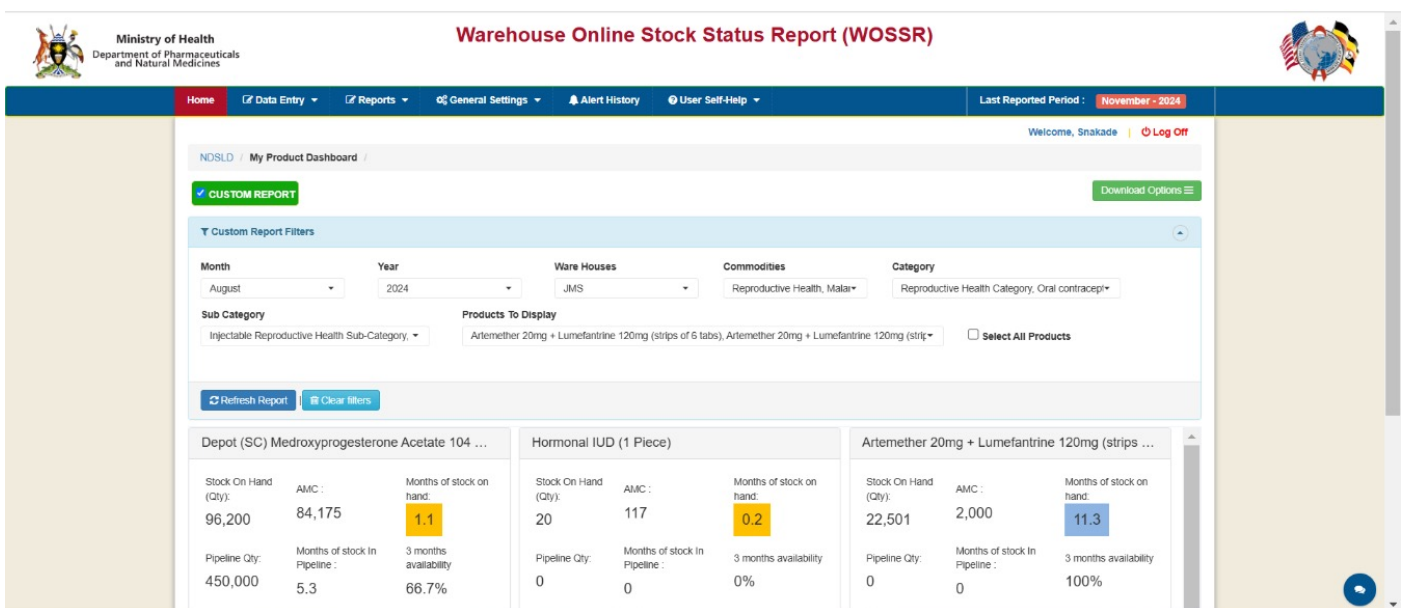


Figure 4a: Custom report in WOSSR

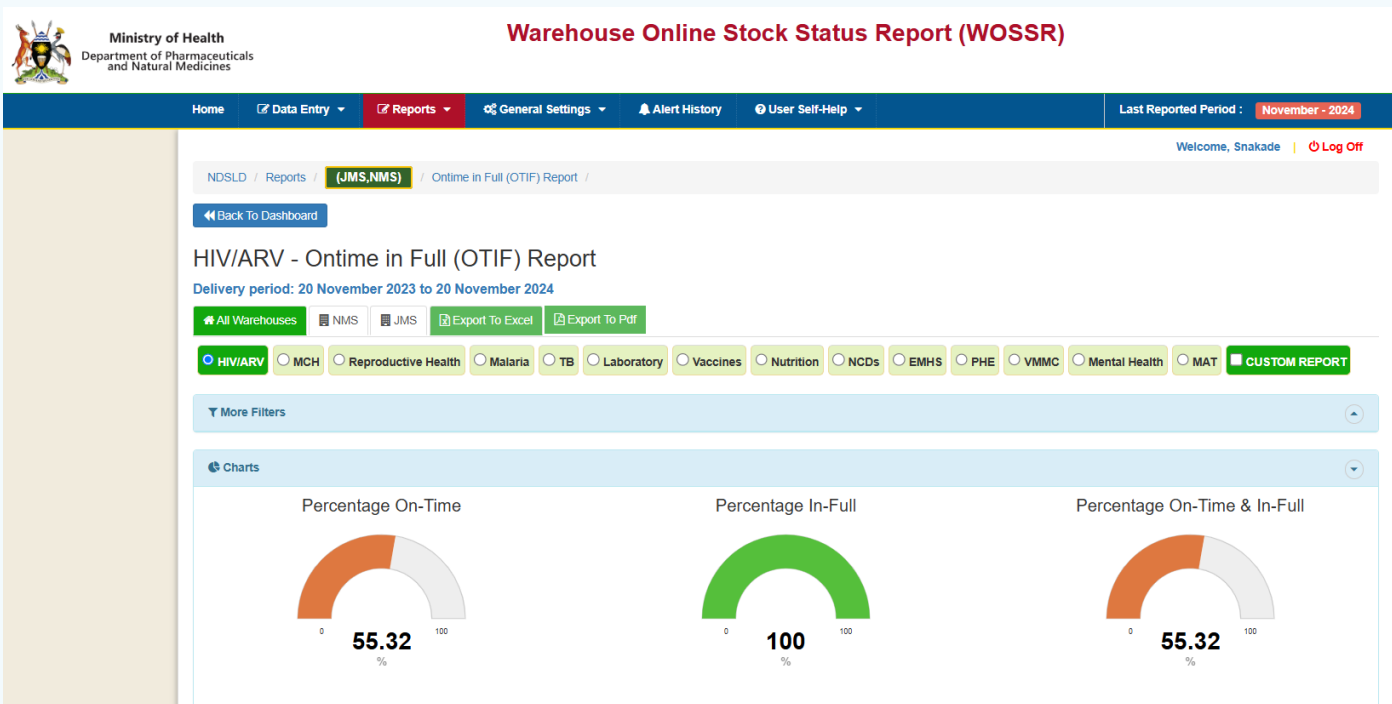


Figure 4b: Tracking on-time reporting indicator in WOSSR

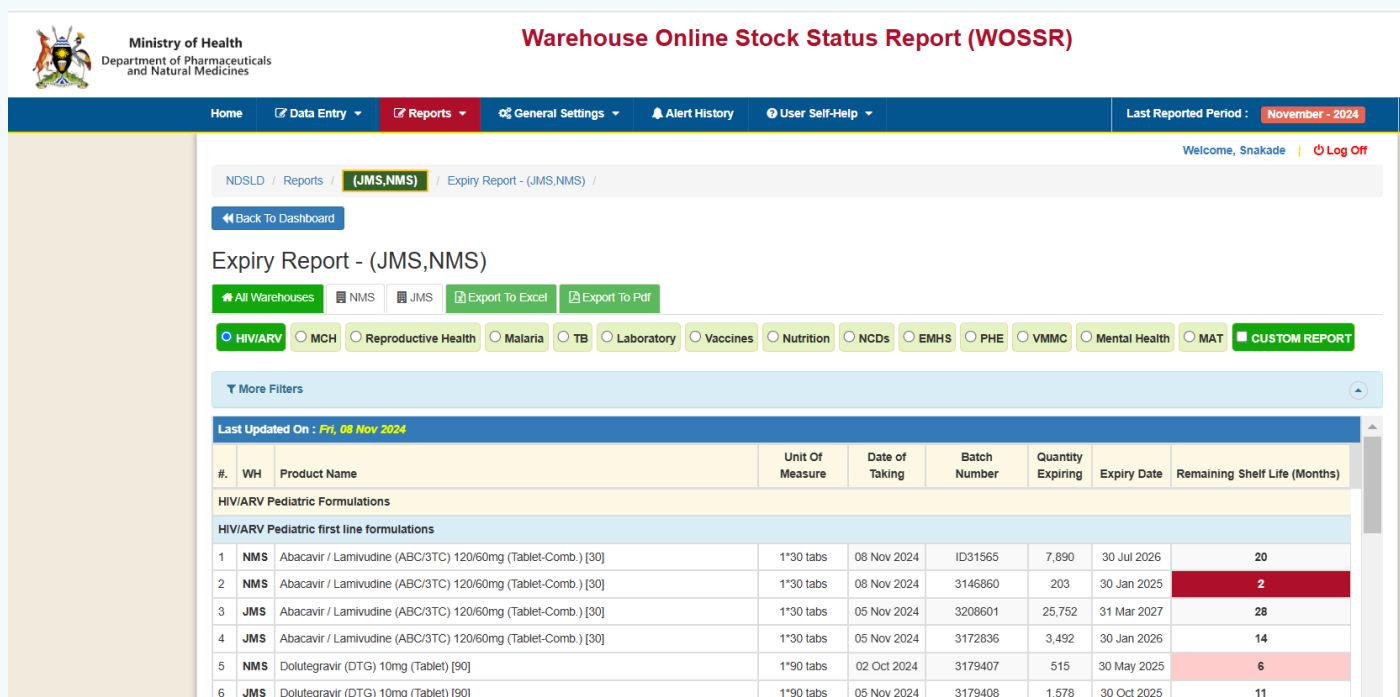


Figure 4c: Expiry report in WOSSR

#### 4 Dashboard Access Statistics

With the redesigned dashboard, data on user login access was extracted by SSCS Activity and analyses conducted of general settings, system access, and reports for the period April 2019 to August 2024.

Following the completion of the design enhancements, the accounts accessing the WOSSR increased 6-fold, from 5 per month in the pre-design phase (January 2020 to December 2021) to 29 per month in the post-redesign (September 2022 to August 2024) period, as illustrated in Figure 5.



I've found the OFSSR useful as follows:

- in easily accessing commodities that are not readily available in RASS system.
- in comparing with Months of Stock for some RTKs, ARVs which data is often required in presentation slides.
- in reducing on the no. of calls/reach-outs from different district teams on where to get particular stock of a highly in-need commodity. In a nutshell, it has made easy redistribution efforts.—Nazir Tebandeke | Medical Logistics Officer, USAID Local Partner Health Services-Eastern Activity

Cumulatively, the accounts that logged-in to the WOSSR increased from 147 in December 2021 to 746 in August 2024 (with a further spike to 1,724 during the one-day system re-launch event). On average, the accounts are utilizing the system 288 times per month in the post-design period, an increase from 36 times in pre-design. The stock status report was the most accessed at 70.5% (13,702/19,444), followed by the pipeline tracking report 16.7% (3238/19,444), issues data report 5.9% (1,154/19,444), expiry quantity report 2.7% (530/19,444), availability in months report 2.2% (421/19,444) and average monthly consumption (AMC) report 2.0% (388/19,444). Development partners and MoH access the WOSSR the most as shown in Figure 6.

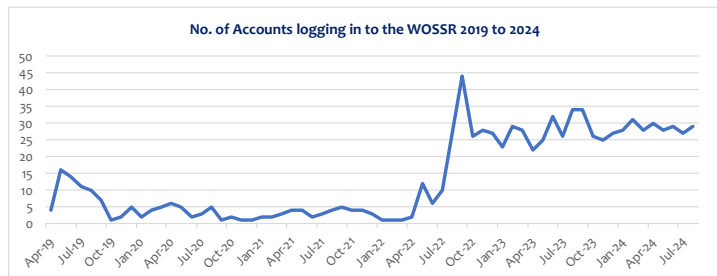


Figure 5: Number of Accounts Logging into WOSSR

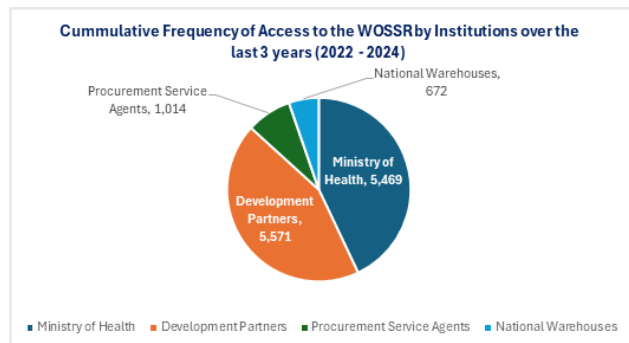


Figure 6: Cumulative Frequency of Access to WOSSR by Institutions

## B. OFSSR

The OFSSR is accessible via the NHDW. The dashboard is tailored to national, regional, district, and program specific visualizations for management decision making at all these levels.

### 1 Automated data analytics

The OFSSR dashboard (Figure 7), built on the MS Power BI platform and hosted within the NHDW SQL SharePoint server and was rolled out to the users in March 2023. It is directly integrated with the DHIS2 system, automatically fetching updated monthly stock data on the 41 tracer items reported in the HMIS 105 section 6 by over 4,000 public and private-not-for-profit health facilities. It produces simple, interactive, and informative visual analytics which provide information on four (4) key supply chain indicators i.e., commodity availability, stock status, expiries, and reporting rates per month. This enables accessing information in real-time to inform necessary interventions in health facilities.

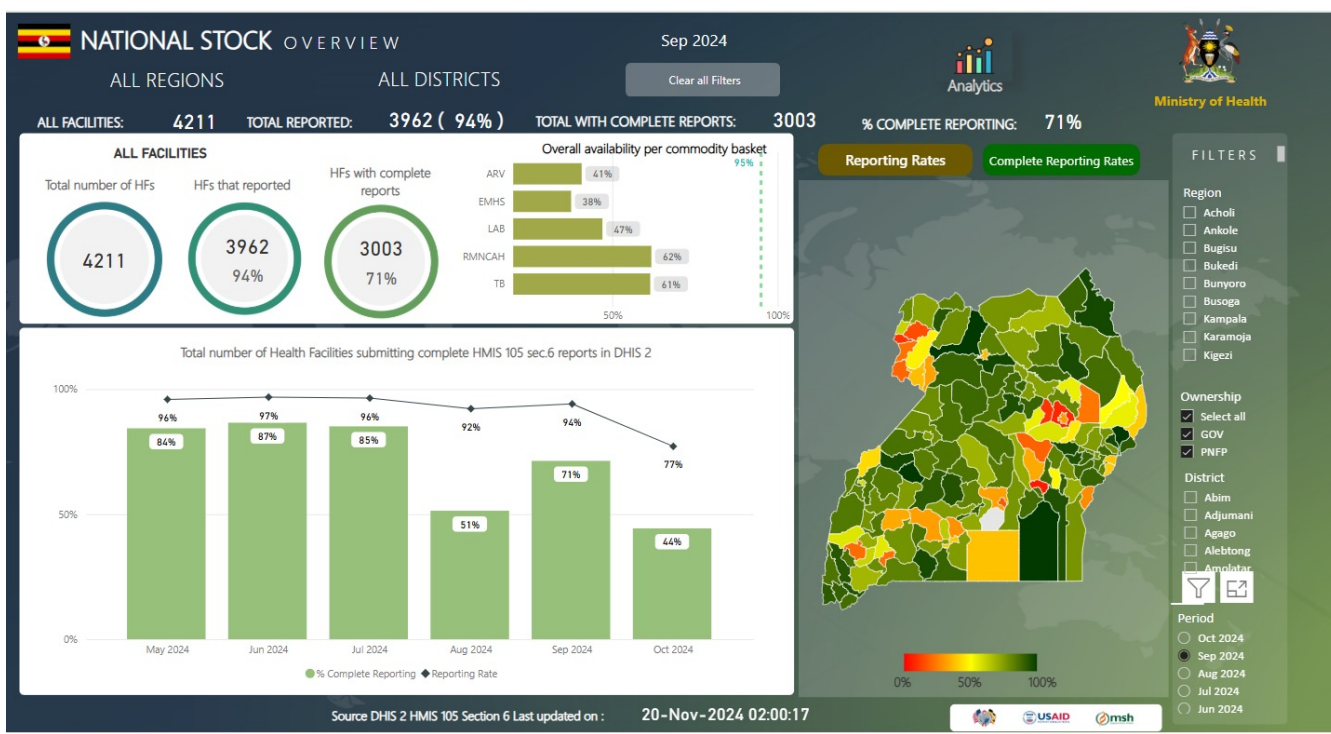


Figure 7: Screenshot of the OFSSR dashboard



## 2 System Access

Out of the 14 dashboards on the MoH portal, OFSSR dashboard is the top searched dashboard (Figure 8). Its reach has steadily increased since its roll out in March 2023 and reached 9,255 by August 2024.

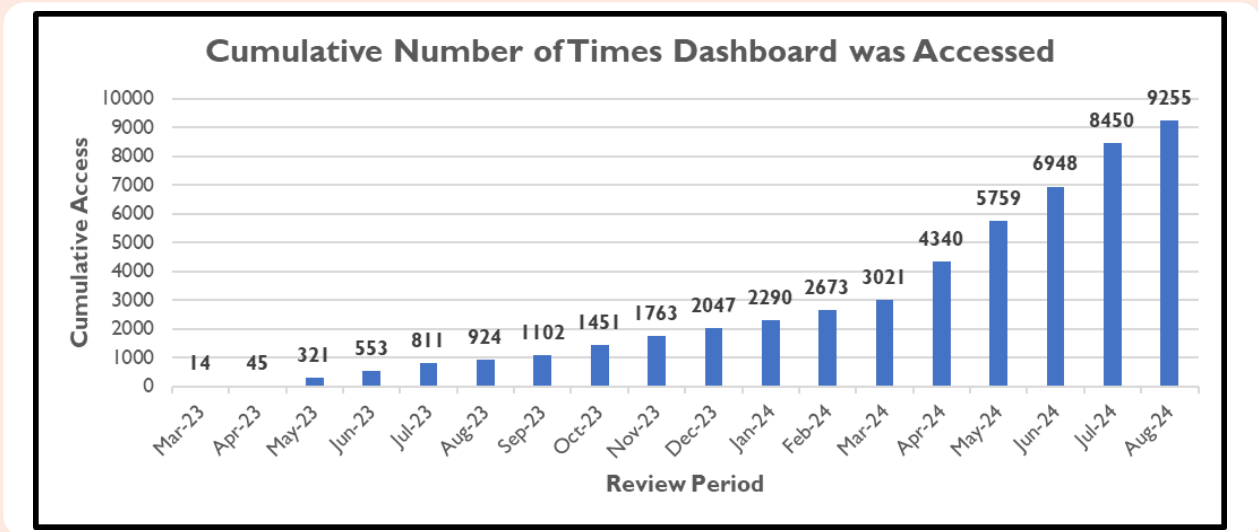


Figure 8: Access to OFSSR dashboard

ossr.health.go.ug

WAREHOUSE ONLINE STOCK STATUS REPORT

Months of Stock as of September 2022: All Warehouses

THE PHARMACEUTICAL INFORMATION PORTAL WAREHOUSE ONLINE STOCK STATUS REPORT

Stock Status Redefined

ACCESS NOW

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msh Management Systems for Health



Timely visibility of medicine stocks across facilities in the district used to be very challenging for my work as a Medicine management supervisor (MMS). It was hard to know which facilities were overstocked or understocked to quickly intervene. OFSSR dashboards have solved this problem. On a weekly basis, I do a quick drill-down into the stock status reports in the OFSSR, and with certainty I have an idea of which sites have excess medicines, then I make a phone call to that site to confirm. Once I have confirmed, I initiate a requisition through the DHO's office and move these excess items to facilities that need them.—Acaye Kenneth Kaunda, MMS, Agago district



The OFSSR online dashboards have become my new quick guide in monitoring stock of medicines & supplies across the facilities in Kitgum. My most visited section in the OFSSR is the stock status reports detailing out what each facility has in terms of stock. I use this information on a weekly basis to initiate redistributions across facilities in consultation with my DHO.—Omony Jimmy Klein, DMMS & HMIS focal person, Kitgum district

## 3 Data Use Case

The regional technical groups set up various forums including WhatsApp supply chain groups that bring together representatives from the MoH, DHTs, health facilities and implementing partners to enhance coordination and discuss supply chain components such as health facility stock status.

Through Lango WhatsApp supply chain forum, results from the OFSSR dashboard were shared and Opeta HC III was found to have reported 8,825 malaria rapid diagnostics (worth \$ 2,471; UGX 9,389,800) to be expired. Given the high quantity, the district personnel engaged the health facility on the WhatsApp forum which confirmed that this was a data capture error and therefore accurate data for the reporting period was reported, which indicated no expiry.



## Lessons Learned

- ▶ Early stakeholder engagement for requirements definition, and dashboard prototyping was crucial to capture all user needs during the design and development.
- ▶ The MoH requiring to re-direct all user requests to the portal, existence of standard operating procedures to guide user system navigation, and issuance of QR code enabled institutional accounts were enablers to uptake in using the dashboards.
- ▶ Development of the dashboards in the MoH national health data warehouse and use of institutional accounts allow for sustainable data management and access to information by stakeholders.
- ▶ Availability of data in a central spot enhanced decision making and remote support to address identified challenges.

## Recommendation

It is important that national and sub-national stakeholders embrace using these health information systems with built-in analytical solutions to enhance real-time access to information, utilization and decision-making for more effective healthcare delivery and better health outcomes.

### About USAID SSCS Activity

The USAID-funded Strengthening Supply Chain Systems Activity aims to support the Government of Uganda to move its health supply chain system further to accelerate local capacity development by improving performance to ensure uninterrupted availability of quality essential medicines and health supplies (EMHS), improving the health status of all Ugandans. The SSCS Activity is implemented by Management Sciences for Health (MSH), in collaboration with Advocates Coalition for Development and Environment (ACODE) and Uganda HealthCare Federation (UHF).

For more information, please contact Dr. Eric Lugada at [elugada@ug-sscs.org](mailto:elugada@ug-sscs.org)

*This publication was made possible by the generous support of the American people through the United States Agency for International Development (USAID) under cooperative agreement number 72061720CA00008. The contents of this publication are the responsibility of Management Sciences for Health (MSH) and do not necessarily reflect the views of USAID or the United States Government.*



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