Taking Supply Information Systems to the Next Level: Regional Collaboration in TB Medicines Supply Chain

Participants during the ECSA dashboard training and handover event. Photo credit: MSH

PROJECT CONTEXT

Tuberculosis (TB) remains a major public health problem in the regions of East, Central, and Southern Africa (ECSA). Because TB is an airborne disease, its transmission is facilitated by the movement of people across internal and national borders. Available risk mitigation measures in the region are largely inadequate, and individual countries are ill-prepared to handle disease control issues beyond their national borders. To operationalize the TB control strategy in ECSA countries, USAID, through Challenge TB and MSH, has facilitated technical and financial support for pilot cross-border TB interventions that span the region, including border areas. Among the challenges requiring intervention were prompt detection and treatment of TB among mobile populations crossing the borders, harmonization of TB treatments, and design and implementation of a supply chain information system that allows stock information sharing among member countries to ensure continuous availability of TB medicines.

CALL TO ACTION

Tuberculosis and information know no boundaries. The TB medicines supply chain has national, global, and regional implications. Regional collaboration in supply information systems is critical to ensure that medicines are accessible, affordable, and safe for all.

REGIONAL DASHBOARD

DESIGN AND IMPLEMENTATION APPROACH

To harmonize cross-border treatment of TB patients crossing country borders in the ECSA regions, in 2015 member countries agreed to a regional, web-based supply chain information system that tracks patient and stock information and shares it among member countries to support evidence-based decision making. Before the system was designed, a thorough user requirement assessment was conducted in several countries to understand and document users' demands and system requirements. A System Requirement Specification (SRS) document was prepared. On the basis of the SRS, a web-based system was developed, demonstrated and tested in 2016 and 2017. The system was designed with three major features: data entry, report (including dashboard), and system administration. A three-day training and user acceptance testing was conducted in April 2017 in Rwanda, Uganda, and Tanzania. Feedback was solicited and incorporated to improve the system. The final software product was installed in June 2018 following system users and administrators training.

Features of the Dashboard

The automated, web-based dashboard is designed to foster simple data entry, faster information processing, and increased supply chain data visibility while reducing the workload.

The **data entry** feature is designed to emulate the manual data capturing tool, which maintains simplicity and uniformity across the region. It has the capability to capture stock and patient information at different levels

Figure 1. ECSA Supply Chain Dashboard displaying stock status of TB medicines across regions
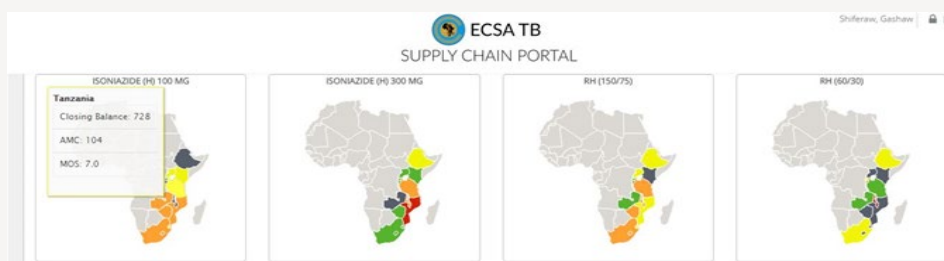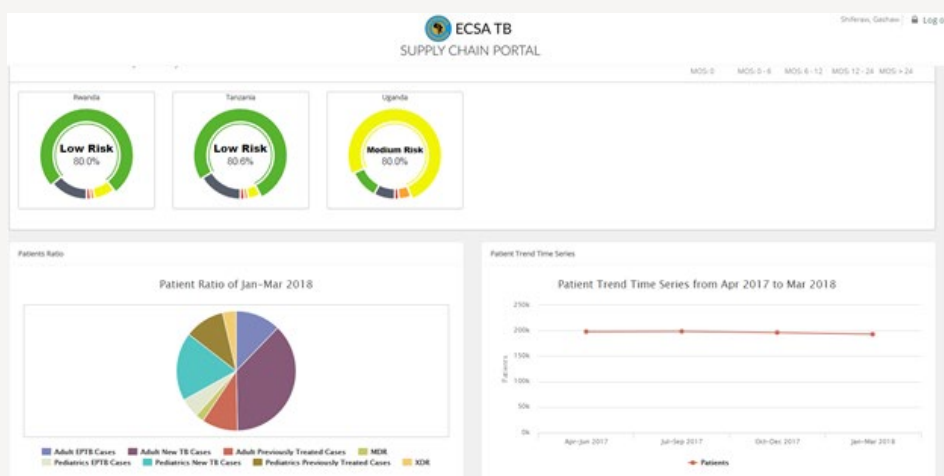

Figure 2. ECSA Supply Chain Dashboard displaying stock status of TB medicines

of a country's supply chain system, and it is interoperable with existing systems. In addition, auto-calculation, pre-population, and validation rules during data entry are built in to prevent errors and reduce the workload at the time of data capture.

The **report** feature is designed to display information in different formats, such as charts, tables, and maps. Reports are categorized by country, supply chain level, and individual TB products. The system has 16 national and 14 health facility-level reports in different formats. This enables users to visualize stock status, consumption patterns, and outstanding shipments to make informed decisions. For

example, considering the amount of stock available and its consumption pattern, the system informs users if they need to transfer or borrow TB medicine(s) to or from border countries before medicines expire or are stocked-out. The system also helps countries redistribute TB medicines among facilities. The reporting feature accommodates supply chain key performance indicators, such as percentage of facilities with stock-outs, potential stock-outs, understocked, or overstocked for individual TB medicines and percentage of facilities maintaining an optimum stock level according to the country's inventory policy.

Another important feature of the dashboard is its **administration** feature. This feature allows countries to successfully manage TB product lists, TB service-providing facilities, intermediate stores, system users, funding sources, and individual countries' maximum-minimum inventory control policies.

Benefits of the Dashboard

- Reduced data burden through auto-calculation and pre-population during data entry
- Enhanced data analysis and reporting with automatic reports by each level of a country's system and by TB products
- Simpler usability by emulating the current manual system and common data requirements in each country
- Enhanced data availability, visibility, and accessibility online with interactive maps, charts, and tables
- Enhanced coordination among key players and existing country systems through interoperability
- Enhanced accountability and performance indicators to ensure implementation across the region
- More streamlined supply chain decisions for quantification, procurement, and re-distribution among countries
- Improved data quality, uniformity, and integrity through the validation, security, and approval processes
- Early warning system for wastage reduction, stock-out prevention, and redistribution planning

Figure 3. ECSA Supply Chain Dashboard displaying stock status of TB medicines for a single country
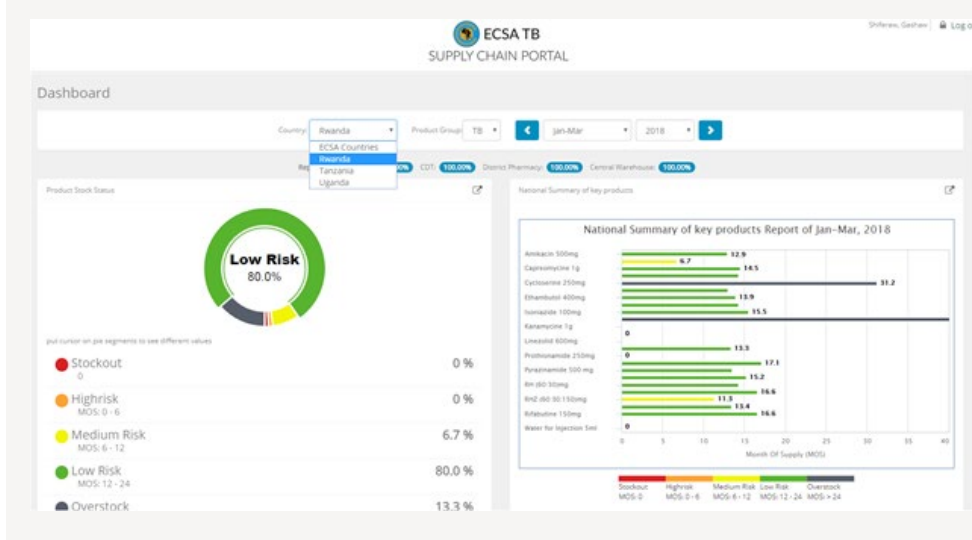
LESSONS LEARNED

Developing regional systems requires thorough user and system requirement gathering in each country to understand common data requirements and the unique nature of each country's supply chain (e.g., having different inventory holding policies and reporting intervals). This helped to engage and involve key stakeholders in each country and accommodate requests with the aim of cross-border supply chain information sharing for decision making.

A detail use case analysis, system requirement gathering and documentation, vigorous testing, and solicitation of feedback were also critical to developing the system.

Building the capacity of local dashboard users and system administrators is important for the successful implementation, sustainability, and ownership of the dashboard. The dashboard could be used by regional donors and implementing partners to allocate their resources where they are most needed.

SUCCESS STORY

On June 8, 2018, MSH and KNCV—through the USAID-funded Challenge TB project and ECSA Health Community—launched a new, web-based regional TB patient and medicine supply chain information dashboard to harmonize TB diagnosis and treatment to patients crossing borders and enhance information availability and visibility across the ECSA region. The dashboard provides Ministry of Health National TB Programs, donors, and partners in the ECSA region with TB-related patient and stock status information to make cross-border supply chain decisions. The information from the dashboard serves as a mechanism to help avert stock-outs, prevent wastage, avoid emergency procurements, and ensure an uninterrupted supply of TB medicines across the region. Eventually, it will help ensure that patients crossing borders will be able to continue and complete their ongoing TB treatment.

The dashboard will improve the user's ability to capture, analyze, and generate TB patient and supply chain information for decision making in each member country. In addition, it enhances visibility through a secure website. To ensure data quality and reduce workload, the system includes built-in features such as auto-calculation, pre-population, and validation rules. On June 6–8, 2018, as part of the handover, 10 people from the Ministries of Health in Rwanda, Tanzania, and Uganda and the ECSA Health Community Secretariat were

trained on how to use, manage, and administer the dashboard. On the last day of training, a handover event was organized for participating countries, KNCV, MSH, and ECSA Health Community Secretariat Director General Professor Yoswa Dambisya. During the event, Professor Yoswa recalled the 2014 ECSA member counties' initiatives to harmonize cross-border TB diagnosis and treatment. He said, "Tuberculosis is the most contagious airborne disease and knows no boundaries. Therefore, the action countries implement need to cross boundaries too. This is a good platform that neighboring countries could share TB medicines related information so that TB treatment and continuum of care for patients will not be interrupted when they are moving from one member country to another."

Professor Yoswa expressed his gratitude to the USAID East Africa region for financial support, KNCV for coordinating the activity, and MSH for technical support in the

design of the dashboard. Dr. Victor Ombeka, Country Representative for KNCV Kenya, congratulated ECSA and member countries for completing the training and transferring the system to their own server. He also highlighted the importance of implementing the dashboard in the current member countries, which will give clear direction to scale up and bring in more member countries to share TB-related patient and stock information for cross-border TB diagnosis and treatment harmonization initiatives.

ECSA assumed ownership and is implementing the system across Rwanda, Tanzania, and Uganda, with the goal of having it fully operational by August 2018. The result and lesson from the three countries implementation will help to include more member and non-member countries in the region and work on interoperability of the dashboard with each country's existing supply chain information systems.

Prof. Yoswa Dambisya, ECSA Director General, speaking during the event.
Photo credit: Gashaw Shiferaw/MSH

WAY FORWARD

- Inadequate financial and human resources to be leveraged among donors and implementing organizations. Although it may not be resource intensive, financial resources to hire and train data entry operators and system administrators would help to successfully implement the dashboard.
- Currently only three of the 20 ECSA member and non-member countries in the region are incorporated into the system. More coordinated effort and ownership would help to bring more member countries on board to support the cross-border initiative in sharing TB supply chain information.
- Although the dashboard has the capability to integrate with any existing country system, interoperability between existing electronic systems and the dashboard has yet to be addressed. A requirements assessment, including technology platforms, supply chain data requirements to be exchanged, and necessary platform to ensure interoperability, should be conducted.