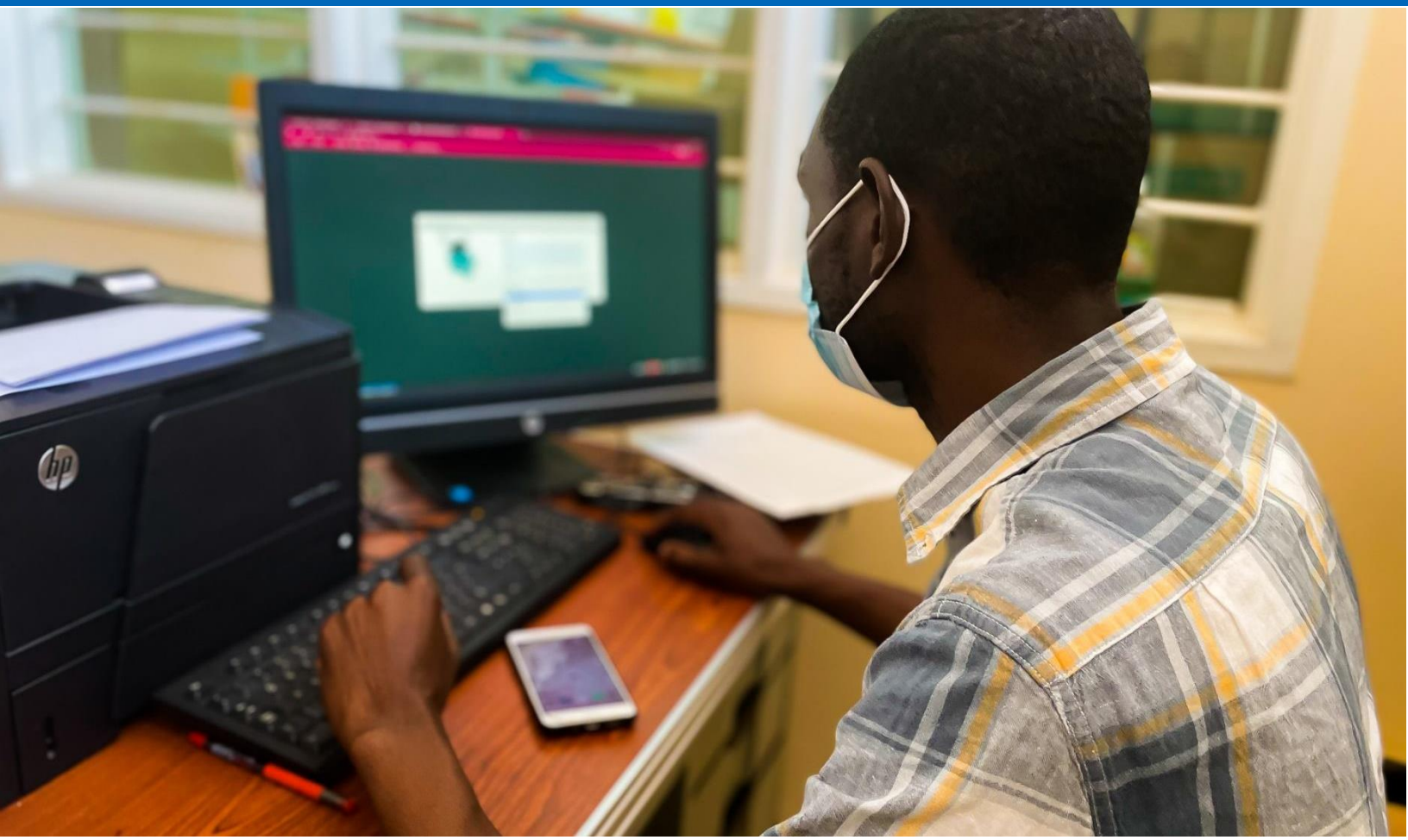
The United States Agency for International Development Electronic Supply Chain Management Information System Project

Project Year 3 | 2022 Annual Report



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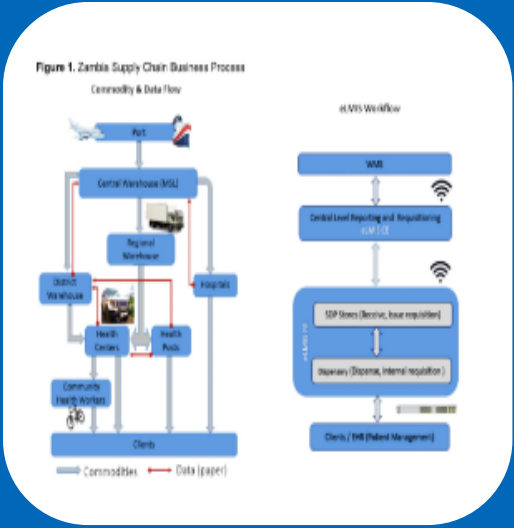
ACRONYMS

ARV	Antiretroviral
CE	Central Edition
CHAZ	Churches Health Association of Zambia
eLMIS	Electronic logistics management information system
eSCMIS	Electronic Supply Chain Management Information System
FE	Facility Edition
GHSC-PSM	Global Health Supply Chain Program-Procurement and Supply Management project
GRZ	Government of the Republic of Zambia
HIV	Human Immunodeficiency Virus
IMPACT	Information Mobilized for Performance Analysis and Continuous Transformation
IR	Intermediate Result
JSH	John Snow Health Zambia Limited
JSI	John Snow, Inc.
M&E	Monitoring and Evaluation
MOH	Ministry of Health
PEPFAR	United States President's Emergency Plan for AIDS Relief
R&R	Report and Requisition
TB	Tuberculosis
USAID	United States Agency for International Development
ZAMMSA	Zambia Medicines and Medical Supplies Agency

THE USAID eSCMIS PROJECT

The United States Agency for International Development (USAID) Electronic Supply Chain Management Information System (eSCMIS) project builds on the success of the electronic logistics management information system (eLMIS) in Zambia. This project supports the Government of the Republic of Zambia (GRZ) and the Ministry of Health (MOH) in digitizing and building efficiency into the national supply chain, ensuring sufficient quantity and quality of essential medications, laboratory commodities, and ready availability of malaria, human immunodeficiency virus (HIV), and family planning products at health facilities across the country. The primary objective of the USAID eSCMIS project is to ensure that the eLMIS improves supply chain visibility to support enhanced decision-making and increase accountability and local ownership.

Overview of the Zambia Supply Chain



Zambia's supply chain has been digitized since 2014. Its (approximate) 3,000 health facilities are located in 116 districts and 10 provinces. Nearly 50 percent of these facilities manage their inventory and order products through the eLMIS Facility Edition (FE), which is linked to the Central Edition (CE) that is used nationally for order management and resupply. At the end of each month, the data are aggregated and a report and requisition (R&R) is generated and sent to the eLMIS CE for resupply. Facilities without eLMIS FE complete a paper-based R&R that district personnel enter into the eLMIS CE. All R&Rs in CE are resupplied from Zambia Medicines and Medical Supplies Agency (ZAMMSA), where the Commodity Security Centre reviews, approves, and converts them into an order that is entered into WHXpert, the warehouse management system. Churches Health Association of Zambia (CHAZ), an MOH partner, also holds and supplies goods through a separate pharmaceutical warehouse. eLMIS FE is installed in over 90 percent of CHAZ's faith-based-connected health facilities.

The eLMIS was implemented by John Snow, Inc. (JSI), in partnership with the MOH, ZAMMSA, and other key supply chain partners. John Snow Health Zambia, Limited (JSH) is mandated to support the transition of the eLMIS into the next-generation logistics information system through the USAID eSCMIS project. JSH is the prime contractor on the USAID eSCMIS project, with JSI and CHAZ as subcontractors. The National Health Strategic Plan (2017–2021), the eHealth Strategy (2017–2021), and the Health Sector Supply Chain Strategy (2018–2021) are all committed to the project.

USAID ESCMIS PROJECT YEAR 3

This report covers October 1 2021–September 30, 2022, Fiscal Year (FY) 2022 / Project Year (PY) 3, during which the country's eLMIS deployment digitized the health supply chain, enabling health care workers to deliver standardized services and use data to inform decisions. The project made significant

progress in ensuring that the eLMIS is available across the country, with 1,452 facilities now using the eLMIS FE. The project has been fostering sustainability through MOH-led deployments and on-the-job training, as well as acting as a catalyst for equity by enhancing the eLMIS's features to suit the Zambian supply chain. For example, the new community health worker (CHW) app provides access to eLMIS FE features, ensuring commodities that CHWs dispense daily are tracked and that consumption data are saved so they can anticipate community needs.

The project is making significant gains to meet its three goals: 1) implement the next-generation eLMIS; 2) enable GRZ to make data-driven supply chain decisions independently; and 3) transfer eLMIS to GRZ so it can own its data and reporting systems.

KEY ACCOMPLISHMENTS

Deployments

In PY 3, the USAID eSCMIS project deployed the eLMIS FE to 351 new health facilities across 10 provinces and 32 districts (more than 100 percent of the 350 targeted). The MOH deployed 106 (30 percent) of these facilities independently. MOH super users and champions lead training of 941 (80 percent) of the 1,170 health care workers trained. The total number of health facilities with eLMIS FE in the country is 1,452 of approximately 3,000 health facilities reporting on health commodities in eLMIS CE (~50 percent of health facilities covered with FE).

Enhancements

The project upgraded eLMIS FE software to version 4.2.7., which adds weekly medical dispensing from the CHWs to the health facilities they report to, and allows users to view satellite site data. The project has achieved an 81 percent life-of-project completion rate for enhancements; it has another 18 months to complete the remaining 19 percent of the requested enhancements.

System Integration and Data Visibility

The USAID eSCMIS project continued to prioritize the data needs of various system users. It collaborated with the MOH, ZAMMSA, USAID's Global Health Supply Chain Program-Procurement and Supply Management (GHSC-PSM) project, the Institute for Health Measurement Southern Africa, and the U.S. Centers for Disease Control and Prevention to integrate eLMIS with the Enterprise Resource Planning (ERP) and/or Warehouse Management System (WMS) and the country’s patient electronic records system, known as SmartCare. The integrations will be rolled out in PY4. The project also worked on tuberculosis (TB) program logistics, allowing eLMIS FE to have a TB module that tracks patient drug consumption.

Sustainability and Public-Private Partnership

As the project continues to scale up eLMIS implementation to rural and peri-urban facilities, internet connectivity has become increasingly unreliable. One of the most feasible and sustainable internet connectivity solutions has been identified as “television white space” technologies, if friendly regulatory policies are maintained. The project plans to test this technology in at least two health facilities and is working with private technology providers to map the pilot facilities and quantify requirements.

Also, the project continued to train new medical staff entering the health system in the functionality of the eLMIS operating systems. Further, the project worked closely with the MOH to update the Sustainability and Transition Plan.

IMPLEMENT THE NEXT-GENERATION eLMIS

Real-time inventory and streamlined end-to-end logistics are essential for managing a health supply chain effectively. The USAID eSCMIS project's main goal is to enhance supply chain visibility to support improved decision-making and increased accountability. This goal is being attained by quickly rolling out the eLMIS network and providing training to health facilities, upgrading existing and new health facilities from outdated versions, offering strategic technical support to all facilities using eLMIS, and implementing tools for ongoing software support. The project envisions a fully automated, central-to-facility-level health logistics system.

SUPPORTING GROWTH OF A USER-FRIENDLY DIGITAL SUPPLY CHAIN SYSTEM

The project identified 243 new system requirements during the eLMIS National Needs Assessment in 2020. The project has incorporated 196 of these enhancements into the eLMIS suite of software by the end of PY 3. Also, using a change control board comprised of MOH, ZAMMSA, CHAZ, and supply chain implementing partners, and from user feedback, the project continuously identifies and develops new enhancements, improvements, and bug fixes as they arise. The project incorporated an additional 173 new improvements (not included in the original 243 system requirements) into the eLMIS software suite. All new enhancements are communicated through monthly eLMIS user story webinars, a platform also used to train users virtually on new features, and through release notes, published after a new version of the software is released. As the eLMIS continues to mature, the desired goal is for it to reach a transformative stage where there is less reliance on user input and more automated decision-making.

Scale-up: The project follows a systematic process for implementation, prioritizing health facilities based on the volume of commodities dispensed, strategic importance to MOH and United States President's Emergency Plan for AIDS Relief (PEPFAR), and availability of necessary infrastructure. Working with the MOH, during FY 2022, the USAID eSCMIS project and MOH collaborated to deploy eLMIS FE in 351 new facilities. MOH independently deployed 106 (30 percent) of the 351 health facilities. Furthermore, a total 1,170 health workers were trained, with MOH eLMIS super users and champions taking the lead in 941 (80 percent) of the trainings.

Upgraded Software: By the end of PY 3, 1,264 (98 percent) of the 1,295 facilities were upgraded to version 4.2.7 of this system. All other facilities with FE were deployed with this new version.

Mentorship and Support: By stationing project support staff in ZAMMSA hubs located in seven of the nation's 10 provinces, the project has created support units for regional users and put in place a number of platforms to ensure that all support issues are resolved consistently and on time, without disrupting commodity resupply at any facility. Further, during PY 3, the USAID eSCMIS project visited 263 health facilities across all 10 provinces to provide technical assistance. In addition, the team resolved 2,014 (82 percent) of the 2,467 reported issues through the call center.

Monitoring and Evaluation (M&E): The project successfully carried out 321 virtual and physical M&E visits in five provinces. The physical visits focused on data quality and the use of the eLMIS in updating storeroom transactions and reporting using FE, as well as tracking HIV testing and antiretrovirals dispensing, using the electronic daily activity register, while virtual assessments focused on data quality and the use of the eLMIS for health facility transaction capture and reporting. Based on the final data analysis, the USAID eSCMIS project has been collaborating with the MOH at the district and provincial levels to share the findings, lessons, and potential recommendations for improvement where applicable.

FE OFFERS THE FOLLOWING ENHANCEMENTS:

TB and malaria modules: The modules help ensure drug consumption is traced to actual patients. TB and malaria dispensation daily activity registers can be printed for disease monitoring and programmatic decision-making.

Expanded access: District personnel can now access transactional data and see the actual usage data of medical products at the facilities daily.

Electronic transfer: Stock can now be electronically transferred between two facilities with notifications and approvals whenever stock is moved.

Consumption trends: Logisticians are provided with a tabulation of consumption trends for any given period, including receipts, issues, adjustments, and closing balances, making it simple to aggregate and analyze trends for decision-making.

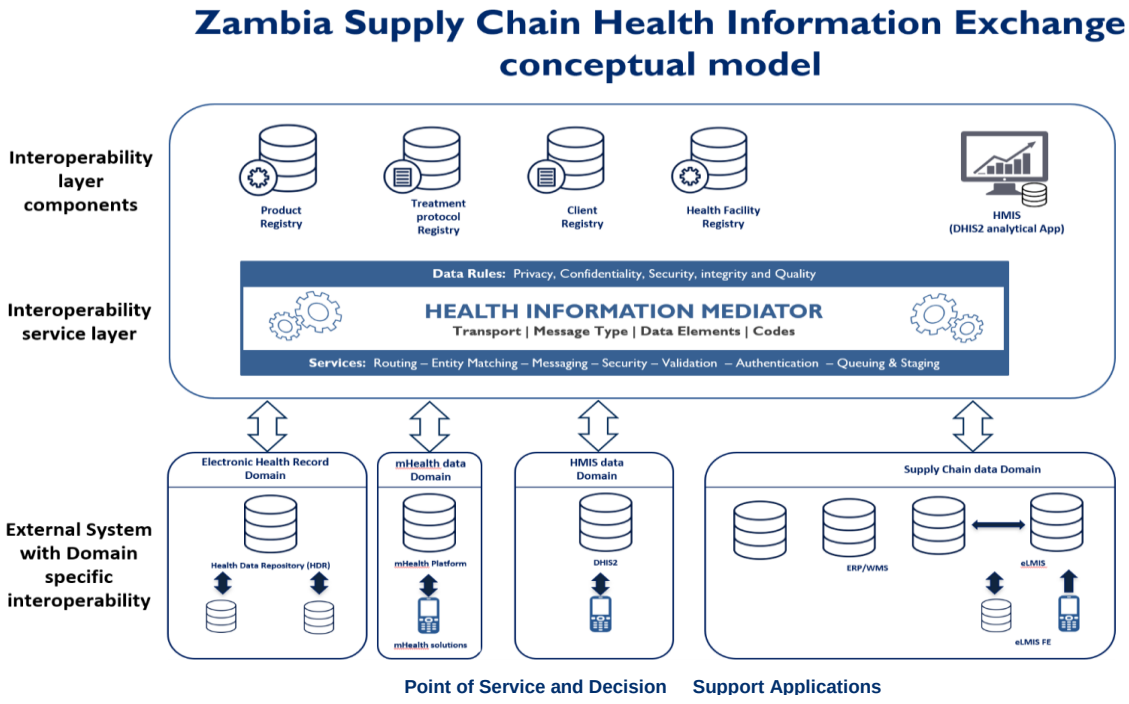
Tracking of eLMIS users: Supply chain managers can view eLMIS users in any district who have been trained in logistics systems, such as antiretroviral (ARV), EM LAB, and HIV.

CHW app from the annual report: The community health worker (CHW) app provides access to eLMIS FE features, ensuring commodities that CHWs dispense are tracked and that consumption data are saved so they can anticipate community needs.


Sign In
Login

eLMIS FE and CE were developed and deployed to automate facility-level data capture and to make supply chain data visible at the facility, district, provincial, and national levels for critical decision-making. End-to-end logistics is now a reality, and eLMIS gives MOH program managers and policymakers access to supply chain data and analytics for decision-making.

Evidence-based or data-driven supply chain decision-making necessitates collecting and using data in a supportive environment. The project has continued to improve data visibility by developing more user-friendly reports and dashboards and improving data analytics and visualization. The project also collaborates closely with the MOH and other supply chain partners to harmonize and systematically implement all supply chain systems available in the country. The project is using a health information exchange conceptual model to guide this activity.



SYSTEMS HARMONIZATION

eLMIS and the ERP/WMS Integration: The USAID eSCMIS project collaborated with the MOH, ZAMMSA, and GHSC-PSM to harmonize and integrate supply chain workflows involving eLMIS and the ERP/WMS, knows as Sage and WHXpert. Despite the fact that the project has continued its efforts toward this goal, recent changes in ZAMMSA management resulted in additional delays in going live with the integration.

eLMIS and SmartCare Integration: SmartCare is an MOH-designated national standard for electronic health records, and it is a comprehensive tool in Zambia that is used to collect, store, and report on aggregate data from a large patient population, as well as to provide health data reports in a timely manner for any level of the health system. The project collaborated with the Institute for Health Management and the U.S. Centers for Disease Control and Prevention to create an integration between eLMIS and SmartCare. The deployment and networking of three pilot facilities were among the key activities planned. The pilot will be initiated later in PY 4 (FY 2023).

Addition of TB Commodities to eLMIS

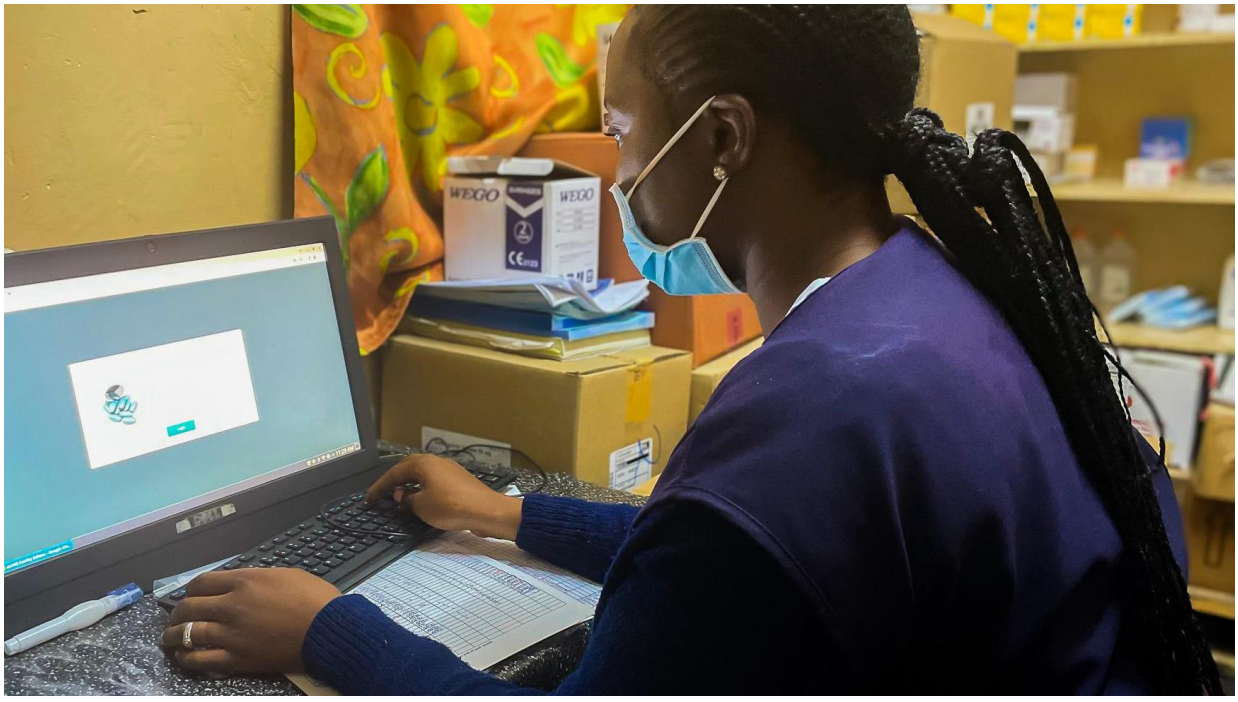
eSCMIS completed upgrades, per MOH request, to manage TB products. The project added product codes to eLMIS and presented this update to MOH for review and approval. The MOH suggested adding a reporting feature to the eLMIS TB module to track the number of clients by regimen and set up alerts for patients considered lost to follow-up.

ART Satellite Sites

The project also worked closely with ZAMMSA and MOH to enable key ART satellite sites to be considered as stand-alone health facilities, thereby linking these facilities directly into the eLMIS CE and streamlining their supply needs (as opposed to having these centers request commodities through “parent health sites”). To date, the project has enabled the creation of 252 new ART sites and enabled a clearer vision of ARV consumption data for improved program decision-making.

Formation of IMPACT Teams

The Information Mobilized for Performance Analysis and Continuous Transformation (IMPACT) team approach is a people-driven approach to supply chain strengthening. Supply chain managers at the district, provincial, and central levels work together to increase product availability, reduce waste, and take collective responsibility for identifying and implementing supply chain solutions. To improve performance, the teams meet regularly and use a quality improvement approach to interpret data (review), prioritize problems and find solutions (innovate), and take action (do). An MOH-approved strategy guides the formation of the district, provincial, and national IMPACT teams in Zambia. USAID eSCMIS project facilitates the formation of new IMPACT teams throughout the year. The goals, objectives, and strategies of the IMPACT teams were presented to pharmacy and laboratory staff in 17 additional districts. The total number of districts oriented now stands at 49 of 116, representing 42.2 percent of the districts.



TRANSFER eLMIS LEADERSHIP TO GRZ

The GRZ has already started to work toward eLMIS self-sufficiency, with key capabilities (support, deployment, etc.) being integrated into MOH systems and processes. Our goal is for the GRZ to be self-sufficient and lead all capabilities by the end of this project.

SUSTAINABILITY AND TRANSITION PLAN

The Sustainability and Transition Plan is an MOH-approved plan that highlights key activities (e.g., MOH staff participation in deployments, on-the-job training, and technical supportive supervision at the provincial and district levels) to ensure total MOH ownership of their digital supply chain solution. Over the last two years, the project has worked with MOH champions and super users to build their technical capacity to deploy and support health facilities. MOH's participation in eSCMIS activities has grown as a result of these initiatives. MOH deployed 106 (30 percent) of the 351 health facilities deployed this year on its own and 1,170 health care workers were trained in total, with MOH super users and champions taking the lead in 941 (80 percent) of the cases and project staff taking the lead in 229 (20 percent). The project has also been educating newly hired MOH data scientists on the interpretation of supply chain data. Furthermore, the project has provided application programming interfaces to the MOH for the transfer of eLMIS data to the National Data Warehouse for advanced analytics and the establishment of the supply chain control tower.

PUBLIC-PRIVATE PARTNERSHIPS

eSCMIS has begun to take on other areas of need to ensure project sustainability:

- This year the project identified a network provider, television white space technologies, that could ensure stable network service in more rural or remote locations, allowing real-time data collection and use to providers operating within those locations and allowing further eSCMIS project expansion.
- The project also identified a partner to enable access to sustainable power sources (solar, in particular) for more stable network abilities.
- Finally, eSCMIS is partnering with a low-/no-cost e-waste disposal partner, Green Line. Green Line is agreeing to free e-waste collection from facilities, districts, and provincial offices—an area of increasing need as the project grows and its work is sustained locally for years to come.

Stories of Impact

Advancing a More Sustainable eLMIS with Public-Private Partnerships

“I recall getting the email that I'd be starting a brand-new job in the health supply chain's technology sector. I was both nervous and eager about the new journey” says Luckson Sichamba, project manager for the eSCMIS project, CHAZ, team.

"The future is technology," Luckson says, "and nothing has shown us that more than the COVID-19 pandemic. I had worked with CHAZ for six years before, and then for Chemonics for four. Work had basically become routine, so despite the nerves I had starting in a whole new arena of the supply chain, I boldly welcomed the opportunity to join the eSCMIS project."

CHAZ has been a member of the national team tasked with analyzing the need for an automated system in the supply chain since the inception of the eLMIS. Many Zambians have limited access to high-quality, low-cost health care. Zambia has made significant progress in overcoming these challenges and expanding health care coverage by building relationships between the public and private sectors. CHAZ supports a significant number of private health facilities across the country and provides more than 50 percent of formal health care in rural areas and about 35 percent of health care nationwide.

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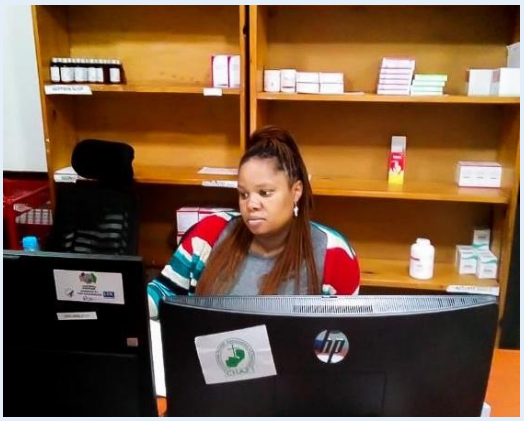
Due to factors such as intermittent power supply, a lack of internet, and difficult routes to and from these facilities, the rural areas that CHAZ serves are difficult to reach. Luckson recalls how difficult it was for CHAZ-supported facilities to submit reports to reorder medical commodities. "The eLMIS FE was what I would call a magic bullet," says Luckson, "because with the click of a button, the report is sent in to our central warehouse and we can plan distribution in good time."



I've been working with the eLMIS since it was implemented at our hospital in 2019. After you complete your dispensation, physical count, and balance, the report is automatically generated; this is a far cry from the report and requisition forms we used to have to fill out manually. I use the system on a daily basis; it has made my job so much easier."

– Theresa Musa Hassab, pharmacist at the CHAZ-supported Coptic Hospital in Lusaka

Private facilities such as the Coptic Hospital in Lusaka are able to provide public services because of support from CHAZ and other public sector stakeholders. The U.S. Agency for International Development and the U.S. President's Emergency Plan for AIDS Relief called for a partnership between local stakeholders in implementing the eLMIS to ensure in-country management, ownership, and sustainability.

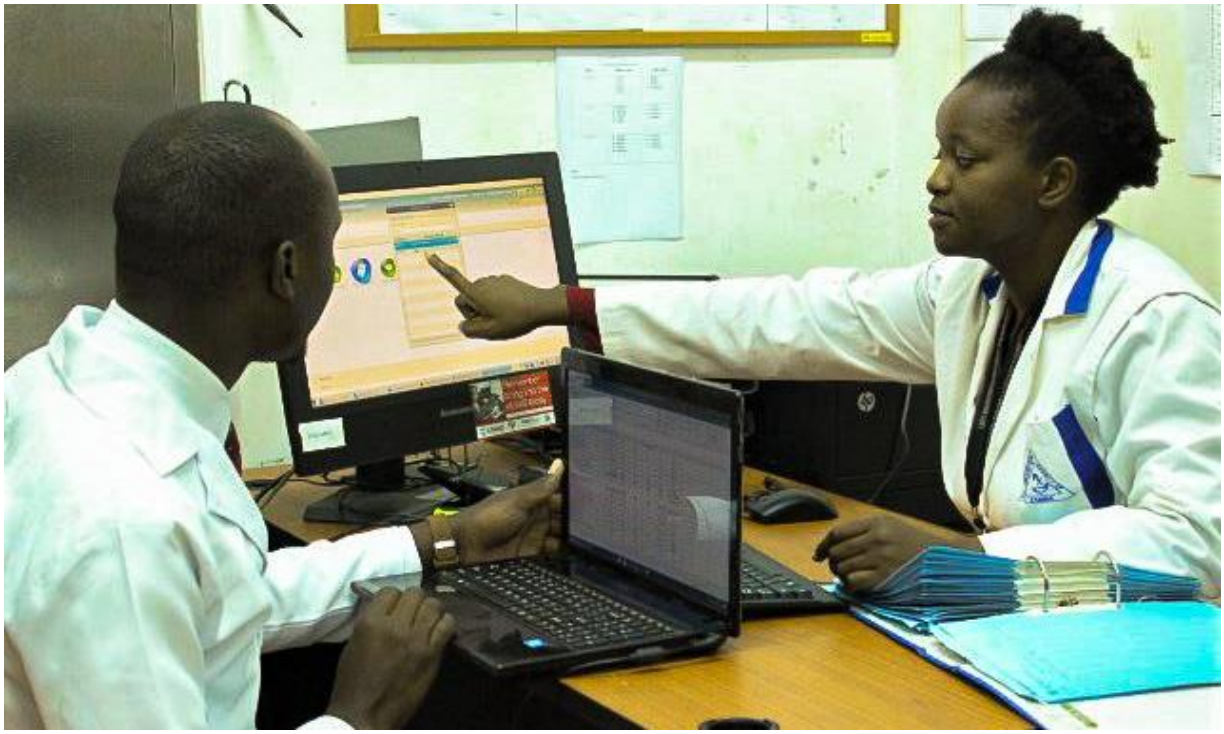
"I rarely have to make emergency orders because we are adequately stocked most of the time. Once we send in our reports to CHAZ, the order is processed within that same month."

– James Kunda Bwalya, pharmacist at the CHAZ-supported Our Lady's Hospice in Lusaka

The consortium, comprising JSH, JSI, and CHAZ, was formed not only to advance the eLMIS to a next-generation supply chain system, but also to establish a skills transfer program. The multi-sectoral collaboration is laying the foundation for long-term sustainability, while also opening channels for the public and private sectors to collaborate to make high-quality health products available throughout the country. So far, 10 CHAZ personnel have been embedded in the project's support, implementation, administration, and software development teams.

"I had no idea I could be so tech-savvy," Luckson says. "Now I can even troubleshoot and run pieces of code needed during the eLMIS implementation. The consortium has moved us from an eLMIS user's perspective to a more behind-the-scenes understanding. We are constantly learning from our colleagues who have been implementing the eLMIS for years, and we in turn transfer these skills to more CHAZ supply chain staff through our technical meetings."

Advancing the eLMIS During the COVID-19 Pandemic



The eSCMIS project created processes and networks that have been embedded into management of eLMIS, helping the MOH to overcome obstacles in ensuring the system in upgraded to the latest standardized version country wide.

The future is automated. Automation enables better service delivery, including improved efficiency, patient management, and data retrieval. This is especially true in Zambian health care, which is becoming increasingly automated. Regardless, implementing eHealth systems in developing countries is fraught with difficulties. These include a lack of infrastructure, electricity, and internet speed. When facilities need to upgrade to the most recent version of the eLMIS, these issues arise in Zambia.

“Our MOH colleagues have been trained in system management since the project began,” says Jeremy Sikazwe, director of systems implementation and support for USAID eSCMIS. We start from the grassroots building capacity with the people we work with, from eLMIS users like pharmacists and lab technicians at the facilities we implement, to our colleagues at ZAMMSA. Despite the COVID-19 pandemic, we managed to upgrade 1,074 of the existing 1,102 sites to eLMIS 4.2.5, leaving only 28 sites that required physical intervention."

The project has created processes and systems to assist the GRZ in taking ownership of the system, allowing MOH personnel to assist with technical management, implementation, and support. According to Jeremy, key project support personnel are stationed in each of the 10 provinces to provide technical support in the districts and provinces. They have identified and trained super users and champions from among MOH staff who have demonstrated a good aptitude not only in system use but also in its implementation and support.

These networks and interventions aided in the upgrade of facilities that required manual assistance during the COVID-19 pandemic. Staff at facilities could seek assistance from key project staff in their provinces, super users, or champions. "I've been working with the eLMIS since its initial implementation in 2014," says Lorent Kabamba, Ndola district pharmacy technologist and eLMIS champion. "By working with project staff on implementation and technical support, I've been able to help my province when needed. This is how I was able to assist facilities in my province that were having difficulty pulling the upgrade." Some provincial staff were able to pool resources and upgrade their servers by transporting them to the facility with the best network or sending them to district or provincial health offices for manual intervention.

The upgrades of 1,074 facilities took less than 30 days. The remaining 28 facilities requiring physical visits due to faulty equipment have been scheduled for support alongside the ongoing first round of new system deployment happening between January 24 and February 11.

USAID eSCMIS's Sustainability and Transition Plan focuses on the government taking over the eLMIS project activities. Throughout the project, GRZ staff must be involved in development, deployments, training, and support at national, provincial and district levels. To this effect, the project continues to build MOH's capacity to manage the eLMIS.

eLearning for Capacity Building of Electronic Public Health Logistics

For an eHealth system to last, capacity building is essential. It is important to equip health care staff with the knowledge and resources necessary to effectively administer eHealth systems, as this will lead to more streamlined and effective procedures and ultimately better service for the communities they are tasked with serving.

The goal of the eSCMIS project is to improve health outcomes by increasing the availability and security of needed medical supplies. This is accomplished by empowering supply chain managers and optimizing supply chain management through the eLMIS.

Registered nurse Loreen Mulobeka of the Mindolo Training Farms Urban Health Center in the Kalulushi district of the Copperbelt province

Training for the eLMIS is provided during and after system implementation in Zambian facilities, and also through the monthly system enhancement webinars, job aids, and recorded video tutorials stored on each eLMIS server. Registered nurse Loreen Mulobeka of the Mindolo Training Farms Urban Health Center in the Kalulushi district of the Copperbelt province says she relies on the eLMIS video tutorials to enhance her eLMIS skills.

"I initially disregarded our sister in charge's reassurance that our facility is doing well as merely another of her many attempts to boost my morale. Being a student who is still learning the ins and outs of the eLMIS and making sure that we always submit our reports on time, I didn't think we were doing that well," Loreen explains. “But after hearing Martha, the district pharmacist, praise our facility's reporting rates and report quality during a visit to the district health office, I thought to myself, "Wow, what am I doing so exceptional that we are one of the best-performing sites in the district?"

Loreen reflects with apprehension and anxieties on her beginning with the eLMIS, "We got deployed with the eLMIS a little over two years ago. I was nervous about switching to electronic methods because I was unfamiliar with them and unsure of how they might affect our procedures, having only ever known a paper-based system. When the system was deployed to Mindolo Farms Training Urban Health Center, the project's system implementation officers trained Loreen and the facility supervisor on the job. "After we were trained, my interest really got peaked because the system practically did most of the work for me. I'd have days when I'd call the help desk to get information on how to use a certain feature if I'd forgotten, but this got less and less as time went when I was informed the server contained video tutorials that could teach me how to use the system." The videos were quite helpful, as they detail how to perform a variety of tasks across all of the system's program areas, including dispensing medications, conducting physical stock counts, and filing reports. " The videos have been a lifesaver," says Loreen. "I used to rely heavily on them, but now I'm more confident in my own skills."

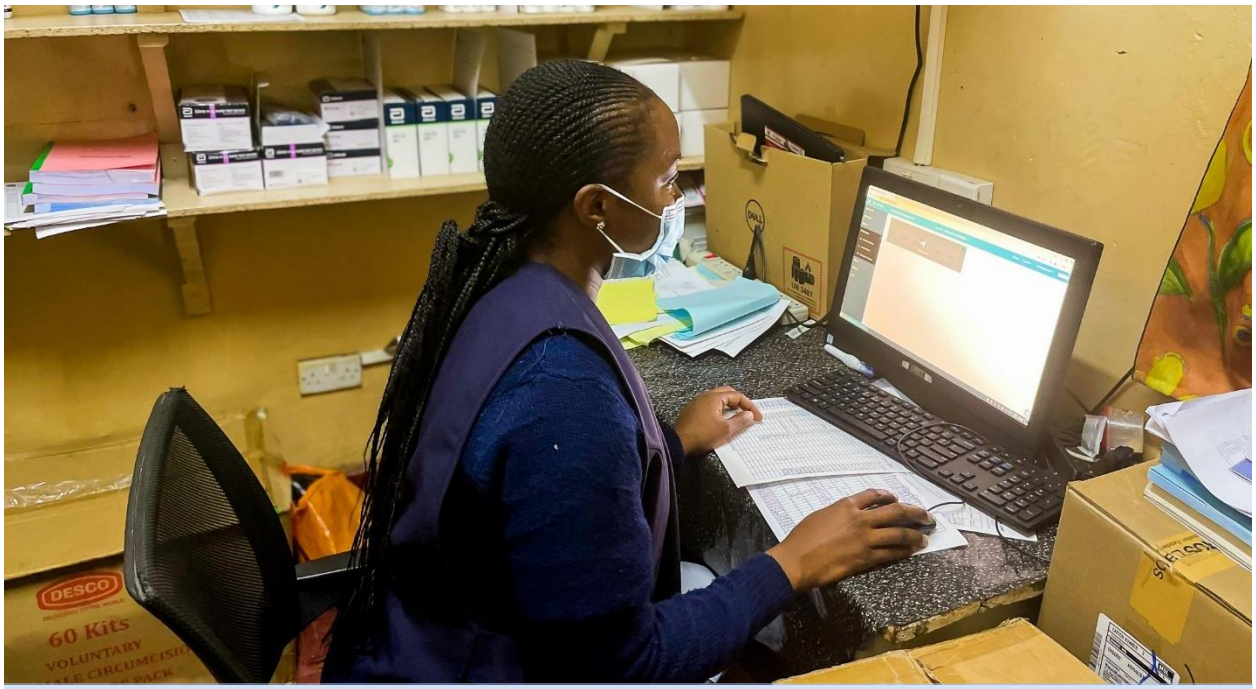
According to Martha Tembo, the district pharmacist at the Kalulushi District Health Office, "you can just see from the quality of the report how thorough Loreen is." Martha adds, "She is really very good with the system, and she learned how to use it in record time. I enjoy how she uses the data." While our national Logistics system ensures that facilities always have a three-month supply on hand, based on consumption statistics, Loreen takes it a step further by forecasting and quantifying her facilities' six-month resupply needs. "You see the areas where the health center is located are usually dealing with power outages. Loreen keeps track of the facility's consumption every time she uses the system, and she uses that information to forecast what the health center will require six months from now. This way, if the facility loses power on reporting day, despite the fact that they still have a few days to report, Loreen will send me the data in advance so that we can set aside or anticipate what the facility will require." The Mindolo Training Farms Urban Health Facility has kept a consistent 100 percent report timeliness in the last year.

As of September 2022, the eSCMIS project had deployed the eLMIS to more than 1,400 facilities across the country. Training and support for each deployment are comprehensive and holistic and the project makes sure to leave each facility with resources like the video tutorials. The goal of the project is to create an automated health product logistics system that is well-suited to Zambia's health logistics infrastructure. As a result, commodity availability across the country will grow, accountability will strengthen, and supply chain visibility will be enhanced for all stakeholders in the public health system.

From Reporting Mechanism to Learning Platform: The eLMIS at Main Masala Health Center

Thelma Lwimba, a nurse at the Masala Main Health Center in Ndola District, Copperbelt Province, says, "When I started working, I didn't imagine I would know as much about health commodities as I do today. I've learned a lot about pharmacy and

lab commodities, and even differentiating a full catalog of medications from what we can offer adults and children, I feel like an encyclopedia. The eLMIS isn't just about reporting; it has helped me enhance my knowledge in health commodities and their management."



Thelma Lwimba, nurse at the Masala Main Health Center in Ndola district, Copperbelt province

As Zambia's supply chain digitizes, it has become clear that its workforce needs to be trained in new technologies and management skills to keep up with the increasing reliance on digital tools to ensure the continuity of commodity supply.

The eSCMIS project, funded by USAID and PEPFAR, has been training staff at Zambia's MOH to sustainably deploy and maintain eLMIS to optimize supply chain management digitally. Thelma Lwimba is just one example of a health care worker who has benefited from the eLMIS's convenient data management system that maintains supply chain and health commodities information.

The eLMIS system has an extensive health product database of what is managed by various Zambian facilities. It is tailored to the features of each level of the facility, from health posts to Level 1 hospitals, providing a user-friendly and easy-to-manage interface for the facility according to their requirements. Thelma says, "Because I was given the responsibility to manage the pharmacy, I would spend a lot of time practicing with the system; it is an electronic database for all our health commodities and departments; transacting drugs through the system, we can easily manage the movement of commodities even within the different departments of the facility."

Gaining competence in digital tools can help health professionals do their daily duties more effectively. For example, findings from a 2015 "Time Study" indicate that the automation of previously manual logistics operations has revolutionized supply chain management for logisticians, who previously spent 3–5 days per month working to generate logistics reports. In addition, facility-level cadres can use eLMIS to complete electronic transactions in minutes, cutting their monthly workload to around four hours. Time savings are crucial for improving patient care and the number of people a health worker may see daily.

"It is easy to underestimate the importance of informed decisions when managing commodities," Thelma explains. "With how busy we get, patient care always takes precedence; having commodities automatically managed by the system makes work easy. Just a few data entries within the day gives you the power to effectively and efficiently manage commodities within the facility and ensure you always have health products available for your clients."

Since its inception, the eSCMIS project has provided training to more than 4,000 health care workers from a variety of cadres across the country, including but not limited to IT, data entry/management, biomedical science, pharmacy, counseling, nursing, clinicians, community health workers, and others. Using advanced information systems, Zambia has improved its supply chain management. A more significant number of patients can be helped in a shorter time thanks to the digitization of health logistics. Supply chain management is enhanced by data analytics and digitally supported and deployed systems. All health care workers can participate in supply chain management if given a chance to learn and use the right resources.

Partnering to Strengthen Supply Chain Data-based Decision-making

Mr. Keegan Mwape, Chief Provincial Pharmacist for Zambia's Northern Province.

"We, the Ministry of Health, like the project, work with various partners to strengthen the health supply chain," says Mr. Keegan Mwape, chief provincial pharmacist for Zambia's Northern Province. "It is important to always have supply chain information on hand. We use the data in the eLMIS to help us forecast and measure commodity consumption and logistics trends across any region in the country. This way, we can give accurate data to both the ZAMMSA, which is the main supplier of health products, and to other health commodity supply partners, like faith-based organizations."

eSCMIS and the GHSC-PSM project partner to improve health facility reporting rates through eLMIS so that health commodities are always restocked on time and to improve commodity data quality in the system. They recently migrated GHSC-PSM's supply chain analytics dashboards, which show health facility reporting rates, commodity stock status, product changes, and consumption statistics, to the eSCMIS-supported eLMIS Central Edition (CE). The eLMIS CE is a centralized web-based system that houses data on the supply chain movement of health commodities from ZAMMSA all the way up to when the products arrive at facilities and are dispensed to communities. This system is used by a large number of people, including Ministry of Health staff and various supply chain managers and partners.

"As a supervisor, I can't emphasize enough how crucial eLMIS CE is," Mr. Mwape explained. "It provides a comprehensive assessment of how the supply chain in my province is doing, enabling me to develop targeted actions to strengthen any areas that require it."

Mr. Mwape regularly checks the system for any stock issues, such as overstock of commodities in one district to plan for redistribution to districts that are low on stock. "Consumption trends help me ensure all facilities are adequately stocked," he said. "Information is crucial to managing our supply chains. Occasionally, we observe, for example, that a small facility consumes more of a commodity than a high-volume facility, which begs the question, why? With this knowledge, we can look into the facility further to ensure that it has the infrastructure necessary to handle the increased number of clients, or, for example, if we discover that pharmaceuticals are being looted instead, we can stop such behavior."

Before moving to the eLMIS CE, the GHSC-PSM dashboards were tested on the eLMIS user acceptability testing environment to make sure that users could easily access and use the dashboards. These dashboards provide a platform for supply chain managers to use data in making informed decisions about the supply chain, ensuring that health products are available at facilities and improving patient outcomes.

The eSCMIS project is working to make the eLMIS into a next-generation system. This state-of-the-art, open-source digital platform gives end-to-end, real-time visibility into the country's health supply chain. This helps improve decision-making, accountability, fiscal responsibility, and local ownership, which leads to a more efficient, sustainable, and person-centered supply chain.

"Supply chain managers and partners throughout the country can monitor and track the movement of health products until it gets into the hands of the patient through data supplied by the eLMIS. These data ensure that facilities are well stocked based on consumption trends shown and patient needs (how many patients are coming in each month and how much facilities are dispensing, if they are running low on stock, if they have expiries, and also, what is done with waste or expired commodities)," Mr. Mwape adds, "Because of eLMIS, we have a holistic view of supply chain performance at all levels of the supply chain. We all need to be system regulars to stay on top of all we need to do to strengthen our supply chain."

Peer-to-Peer Orientation on the eLMIS for Effective and Efficient Health Commodity Resupply

Nancy Mwelwa, a nurse at Ellensdale Health Post in Chongwe, Lusaka Province.

"Computers are very strict; if you enter anything incorrectly, your inputs will be rejected," says Nancy Mwelwa, a nurse and eLMIS user at Ellensdale Health Post in Chongwe, Lusaka Province.

Most health posts are located in remote areas, posing a number of challenges in medical supply. The eLMIS automated the health logistics system, allowing for a more streamlined, efficient supply chain, but users' lack of technical know-how can sometimes be a major roadblock.

"At our health post, we have only three employees: myself, the facility in-charge, and a volunteer," Nancy explains. "Because we are understaffed, we have to work in all departments interchangeably. This leaves very little time to attend to our pharmaceutical reporting needs."

Nancy describes the challenges staff face when they have clients who need services but also have to meet deadlines to re-order medical products. "We frequently found ourselves submitting reports late. We welcomed the eLMIS with open arms because we desperately needed the automated process to help us manage and reorder our products, but we hadn't fully grasped how to use it."

Nancy had to go on maternity leave soon after the orientation, and the other pharmacy staff member who had been trained in eLMIS was transferred to another facility. "When I returned, we had a huge backlog that made it completely impossible for us to use the system," Nancy says. "We frequently received calls from the eLMIS call center asking why we hadn't been able to submit our reports." This became aggravating because it meant the team had to transport reports to the district, which was difficult due to the health post's remote location.

Nancy's request for more orientation was logged in through communication with the eSCMIS Project support team, and the team then advised Ellensdale Health Post to collaborate with the nearby Ngwerere Health Post to gain more on-the-job training.

"The eLMIS lead who was providing technical support at our facility mentioned that Ellensdale was having reporting issues, which piqued our interest because Ellensdale is our neighboring facility," says Glenda Phiri, facility in-charge for Ngwerere Health Post. "She mentioned that Ellensdale had already been deployed to and oriented to the system, but they were still having issues with it. We volunteered to go to the facility and conduct an eLMIS refresher course as a result of that conversation."

Ngwerere Health Post team conducting eLMIS training at neighbouring Ellensdale Health Post

Glenda and two Clinton Health Access Initiative facility volunteers went to Ellensdale Health Post that same week. "We were warmly welcomed," Glenda says, "and the Ellensdale team had already prepared a site for us to conduct the training." We began by ensuring that the computers were installed in the correct locations throughout the facility, such as at the ART and pharmacy points. We then continued with the

orientation by sampling a variety of fast-moving goods in the system so that the Ellensdale team could get a feel for managing a diverse range of products in eLMIS." The training went well, and the three Ellensdale employees gained confidence in the system's practical application. "The following Monday, I received a call from Nancy, asking for clarification on a specific product she was trying to enter, and it made me happy to see they were now using the system frequently," recalls Glenda.

"I've noticed a difference in how we work," Nancy, the Ellensdale Health Post nurse, says. "Practice makes perfect, so we make it a point to interact with the system regularly, and we've been able to manage our products efficiently, including sending in reports without putting the workload on the District Health Office (DHO). Previously, we had to wait for someone to travel to or from the DHO to assist us in submitting our reports and requisitions, which caused commodity resupply to be regularly disrupted. Ngwerere's orientation was extremely beneficial to us, and we are grateful they were able to assist us."

The USAID eSCMIS project is responsible for the implementation and sustainability of the eLMIS. A key component of this has been training MOH workers at various levels of the supply chain on how to deploy, orient, support, and provide technical assistance on the system, allowing them to take full ownership of its management. The project has strongly encouraged and empowered facilities with staff who have demonstrated a strong aptitude for eLMIS to conduct orientation and refresher courses for nearby facilities in need. This is the case for the health posts in Ellensdale and Ngwerere. The project envisions processes that will enable the MOH to assume responsibility for the system across the country, with staff stationed across the country's 10 provinces who can effectively implement and provide technical support at facilities; this network of MOH staff skilled in eLMIS continues to grow since the eLMIS was introduced.

Transferring Electronic Data Skills for Long-term Supply Chain Sustainability

Moving from paper-based to digitized systems throughout the supply chain—from entry point to health facilities—provides better transparency around the movement of medicines and commodities in Zambia. This has been made possible by eLMIS, a suite of software that manages health commodity supply chain data from the point of entry (central level) to health facility commodity dispensation to clients (facility level). The USAID eSCMIS project works closely with the Zambian MOH to strengthen supply chain staff's skills to improve data management, analysis, and forecasting using the eLMIS. Zambia's digital supply chain transformation shows the significance of training supply chain managers with skills to install, administer, and oversee digital technologies.

The eSCMIS project uses on-the-job, in-person, and virtual training in addition to job aids and other tools to strengthen MOH staff capacity. Also, trained MOH staff are transferring skills to their colleagues to ensure sustainability while the project takes on a supportive role in preparing for full ownership of the system by the MOH.

From Super User to Champion

Lorent Kabamba Health Office, Copperbelt Province.

“My name is Lorent Kabamba. I am a pharmacy technologist at Ndola District Health Office and an MOH eLMIS champion for the Copperbelt Province. I lead eLMIS technical support on the Copperbelt, assisting staff with any system issues they may encounter, and I also conduct on-the-job training of eLMIS users, but as with anything, we face a few challenges in achieving our goals as support officers.

Mastering the System

One cold Monday morning, I traveled to Misaka Health Post to roll out the eLMIS FE—a software that automates the day-to-day inventory management and dispensing of health commodities to patients. I was nervous because I only had two days to deploy and orient facility users, including the nurse managing the pharmacy who had no computer skills. Like many Zambians, she believes real work is done only on paper—computers are for playing games and music or watching movies. I decided to change the training method, starting with computer basics before moving to eLMIS system management. I ensured the training was hands-on.

My first task was to reassure the managing nurse. I showed her how to use the system and gave her practice tests. After a month of practice, the nurse was transferred to Zam-tan Clinic, a health facility also in kitwe. During one of my visits to Zam-tan Clinic, I found a nurse training other staff on how to use the eLMIS. The facility's in-charge says the nurse is their IT technician. I was so proud of her achievements. I know she will soon be a master trainer, helping other health workers across the province. I am proud of her achievements and to be a part of her journey.

From pilot to adaptation

In 2014, I was invited to the first MOH eLMIS FE pilot training. Solwezi was our training ground for system use and deployment. The eLMIS FE pilot was still in its infancy and needed testing to emulate the Zambian supply chain. Despite the slow adoption of the system, I was excited about the process because we were developing a better supply chain system that was automated and more efficient than the manual paper-based supply chain system.

Practice makes perfect

In 2016, I spent time with a Systems Implementation officer who was in the Copperbelt to deploy and provide technical support for eLMIS. In Kitwe, she spent a day showing me how to use the system and how to provide technical support. I became familiar with the system and spent the rest of my time practicing. From May 2016 to November 2017, I spent three days in the office and two in the field, learning at high-volume facilities so I could provide technical support to other facilities in the province. I needed to understand what users go through daily while using the system. I put in enough practice that now I can conduct a user orientation over the phone and know exactly where features are no matter what page the user is on. Upon the release of a new update, I work in the field to keep up with the latest features.

Moving forward

During my time, I participated in over 28 deployments of the eLMIS and trained over 100 MOH staff. I am always in the field providing technical support and supervision and have helped over 170 facilities. I am now Copperbelt's technical lead. I like strengthening other MOH staff's capacity in digital supply chain management and contributing to their success. As we move toward ownership, I urge continued support from the project for MOH staff to provide comprehensive technical support and supervision."

> *"Of course, I was scared at first because I did not know how to use a computer before Mr. Kabamba showed me how. Now, I really appreciate the system. Before I even knew there was an eLMIS, I had to do paper reports for over a hundred products, and calculating consumption manually took a long time. Since my orientation with Mr. Kabamba, I have moved from Misaka Health Post to Zam-tan Clinic and back to Misaka Health Post. I'm still an eLMIS student, but I'm much more confident now, and I'm happy to help and teach anyone who wants to learn."*
>
> *– Sharon Chikamba, nurse at Misaka Health Post, Ndola, Copperbelt Province.*

All Hands on Deck

Kazungo Kawengo

"From childhood, we are taught to help others in our tight-knit community. I knew it would be a tedious journey, walking three hours each way and crossing a wide stream to help our neighbor Kasabi Rural Health Centre get oriented with the eLMIS, but it did not sit right with me that we were progressing while they were left behind.

I am Kazungo Kawengo, a certified daily employee at Kaaba Rural Health Centre in Kaoma District, Western Province. I grew up in Kaaba, and I know the area well. When I first started at the health centre, I was a security officer. As you know, Zambia's rural facilities are understaffed. I always offered my services when needed, and the in-charge and other facility staff were eager to teach me, so I essentially became an assistant to facility staff.

I was excited when the MOH introduced the eLMIS. I had previously helped staff with paperwork reporting, which was tedious. We were all motivated to learn how to use the electronic supply chain system that would automate commodity management and reordering. Two months later, I was familiar with eLMIS. It is automated and user-friendly. eLMIS significantly reduces the wait time for our clients—under 5 minutes compared to over 10 minutes when we did paper-based documentation. The system helped, especially knowing all our transactions and records were saved securely on the eLMIS system.

All provincial health facilities with eLMIS FE are connected to a 3040 WhatsApp Group where users send queries and receive regular eLMIS updates or feedback. When one of our hard-to-reach partner health facilities, the Kasabi Rural Health Centre, lagged behind with reporting, my facility in-charge linked me up with the center and I offered to help. It was a three-hour walk, but I was determined to bring them up to speed with their reporting.

The in-charge and certified daily employees at Kasabi warmly welcomed me. I showed them how to dispense medications, perform physical counts, update stock control cards, and submit a report to order medications. After we finished, we had to find a spot with good network, so I could show them how to send in their reports.

I encouraged Kasabi's staff to practice using this system. Embracing work and engaging with an open mind make it easy to learn. Since our initial training, I have visited the facility twice to check their progress. As a result, I am confident their reporting rates will rise."

> *"We really needed the orientation, and we appreciate Mr. Kawengo making the effort to come to our small facility. It is not an easy journey from Kaaba, and he made the entire journey on foot. Unfortunately, our system had not* been *updated when he arrived, so he could not walk us through all the new features. But he has made it a point to check in on us, and he has returned twice to ensure that we are making progress and that he can continue to carry us through the orientation. We are constantly practicing and learning new things."*
>
> *– Martin Chinoya, certified daily employee at Kasabi Rural Health Centre, Kaoma District, Western Province.*

Site Initiation

Cindy Chishimba at work

"With the eLMIS, restocking a facility with medication is straightforward. Without it, we rely on less-accurate monthly paper reports for facility transaction details and must wait for someone to order medications using supply vouchers at the district health office. With the system, district and provincial supervisors can easily see your stock status and approve reorders in time for restocking. I have used the eLMIS for a while and was surprised to discover it was neglected when I moved to my facility.

My name is Cindy Chishimba, and I am a nurse at Kitwe's Wusakile Urban Clinic in the Copperbelt. Unfortunately, our facility lacks a pharmacist, which is typical of small health centers.

I first discovered this as a norm in Luanshya at Kapenda Health Post. I did not intend to be a jack-of-all-trades, but in a small facility, you realize quickly that you are capable of more than you know. As a result, I found myself working alone sometimes and had to be a clinician, nurse, and pharmacist all rolled into one.

This was when my interest in pharmacy work grew. I observed the importance of being meticulous with medications—their utilization, recording what is dispensed, and how to submit reports on commodity stock levels. Here, I learned how laborious paper-based transactions are. Imagine my excitement when I found a better way to run a pharmacy at my second job posting when I moved to Allessandros Urban Health Center, also in Luanshya.

I was amazed by how quickly the pharmacy in-charge did his duties using the system. I would spend my breaks in the pharmacy asking questions and doing assignments to learn as much as possible. When I moved to the Mikomfwa Urban Health Center (Luanshya), I found we did not have many staff members who could use the eLMIS. This is where I got all my practice. I volunteered to work at the pharmacy where I would conduct daily transactions. When I ran into trouble, I would call my colleague from Allessandros Urban Health Center, who was always willing to help and guide me through anything. Soon I was managing the entire pharmacy and using eLMIS to run reports.

My fourth relocation is the one that brought me to the Wusakile Urban Clinic in Kitwe. When I discovered the eLMIS packed and unused, I had to play it cool for a while and study how things were done at the facility before applying my skill set. I consulted my boss about the eLMIS. He told me the pharmacist who knew how to use it had transferred to another facility, and other staff did not know much about it. I informed him of its benefits and that I understood how to use it. My boss was delighted at the prospect of me managing the eLMIS because he had been looking into acquiring assistance and orientation so the facility could start using the system again. I powered up the server and client machines and began working through the system. I found it required software and backlog updates before it could fully function. I contacted the project's helpdesk and, with the support officer's help, updated the system and cleared the backlog. It took some doing, but the system is now running.

Because I will not always be there, I started orienting other staff members on the system. We also embedded it in our work plan to have staff rotations on the system so everyone has hands-on experience

> *"So far, Cindy is one of two people I've been able to orient. It is a joy for me to teach others because I find that when I take the time to teach, I learn more. Cindy was a quick study. It is encouraging to see how far she has come. I remember when she moved to Mikonfwa and would call me for advice on things she did not know; but as time passed, the calls became fewer, and I realized she was becoming a pro. I'm glad to see she's now passing on her knowledge to her coworkers."*
>
> *– John Maimba, pharmacy in-charge at Mikonfwa Health Centre, Luanshya District, Copperbelt Province*

with the eLMIS. People learn how to use the system faster by making the orientations practical. As a result, two different nurses swiftly learned how to handle the pharmacy with eLMIS, and the antiretroviral therapy department is learning how to conduct its transactions with the system.

Papers are unreliable, ink fades, and that is no way to keep records. However, when you conduct stock management digitally, every transaction, even from previous years, is available with just a click of a button. I encourage my co-workers to learn, and I am glad we have a system that simplifies our work."

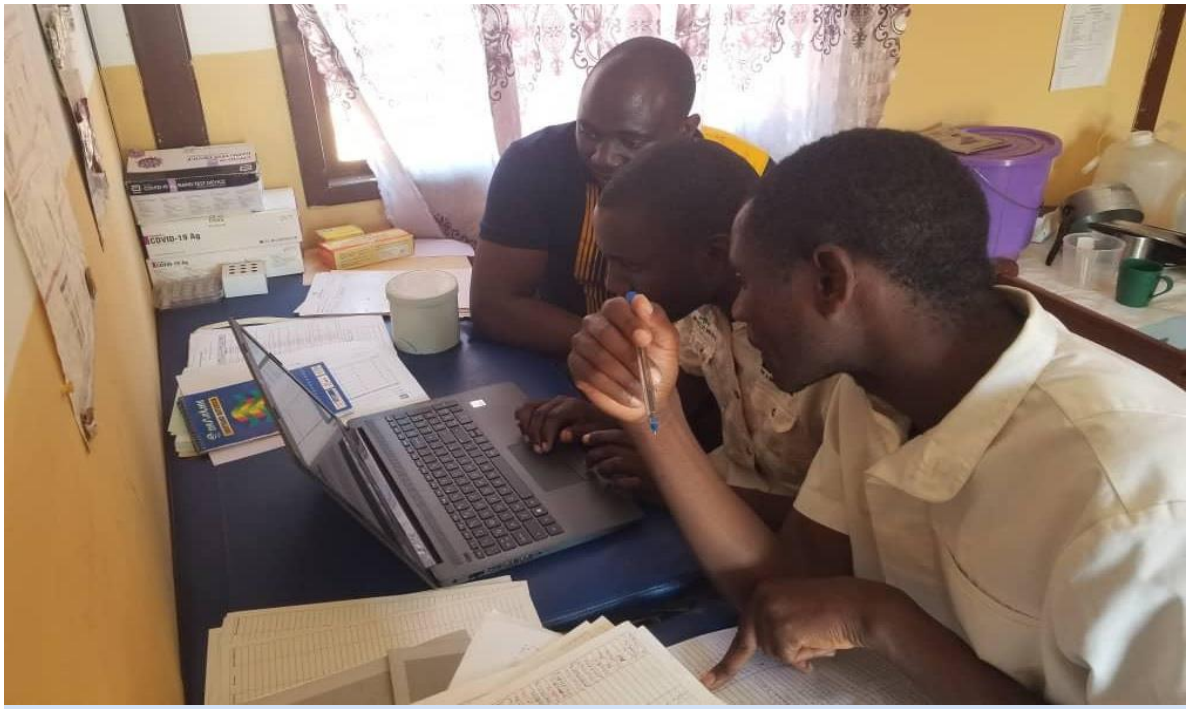
Zambia's MOH Taking Charge of Technical Support and Oversight of eHealth Systems: The Sustainability of the eLMIS

The core issue of any public health intervention is its viability beyond the project's lifespan. The eSCMIS project has systematically implemented intrinsic processes that allow the MOH to take over system ownership. This includes incorporating personnel from MOH into project work plans at all levels of implementation, such as software development, deployment, training, and technical support.

"I really like the system," says Terence Shibwela, Biomedical Scientist at Mongu District Hospital in Zambia's Western Province. "I believe it has a positive impact on how we serve our communities; I always want to make sure that facilities report on time so that they can be resupplied and have commodities to serve clients, especially in our rural areas."

Terrence Shibwela is a Ministry staff member who has been involved in project work since beginning his career as a biomedical technologist in Mongu District. "Within the first week of reporting for work, I had to learn how to use the system. I am now a biomedical scientist by profession, but I began as a biomedical technologist. I was initially assigned to the Mongu District Hospital, but because it had not yet opened, I was transferred to the Mongu Urban Clinic, where I worked in the lab. The eLMIS Facility Edition was still in its early stages, with only a few facilities using it. I quickly discovered that Mongu Urban Clinic was the only center reporting commodity reorders for more than 30 facilities in the district through the eLMIS Central Edition (CE) at the time, so the responsibility of reporting and ordering HIV and lab commodities for all facilities, including Mongu Urban Clinic, fell on me."

Sustainability has been a key implementation factor since the project's inception. The project has engaged different levels of MOH staff in implementing the eLMIS system. Terence demonstrated a special aptitude for the system and was quickly recruited by the project to be trained and to join eSCMIS staff in field activities to learn all system management tenants. "I first encountered the eLMIS during my training in Tanzania, Zanzibar, so I was already familiar with it when I arrived in Mongu. One of the project staff orientated me within my first week, and within two weeks, I was very knowledgeable about its functions. I met all reporting deadlines for the facilities for which I was responsible. Soon after, I was called in for training to become a trainer of trainers at the project headquarters in Lusaka, followed by me accompanying project staff during system deployments in the Western and Northern provinces as the deployment of eLMIS FE was upscaled. I helped with networking, eLMIS infrastructure setup, and on-the-job training for facility staff. It wasn't long before I was taking the lead of some on-the-job trainings during deployments.



Terence Shibwela providing eLMIS on-the-job training.

Terence has been working with the eLMIS since 2017 and has become a seasoned MOH eLMIS support officer. The eLMIS FE has now been deployed to over 150 facilities across Western Province, and Terence provides technical support and supervision for the sites. "eLMIS is now part of my daily routine. What we must always remember is that for the public health system to function effectively, it must be viewed holistically. When I visit facilities, I always check in on how they are doing with the system, even if I'm there for unrelated reasons. For example, a few months ago I was conducting an HIV testing training at the district hospital in Sesheke, and while I was there, I checked in on their eLMIS system because this is our commodity reordering system; they wouldn't be able to conduct the HIV tests without test kits, and they always need to make sure they are stocked up. I found they had system errors with users unable to log in, I managed to help them so they can get back to transacting with the system."

"No one should have to travel many kilometers for medical help because their local facility lacks commodities," Terence says. "I also recently assisted Mapungu Rural Health Center in Nalolo, which is over 250 kilometers from Mongu, where I am; getting there is difficult, especially when it is flooded. They had system errors due to late transaction updates and no training on how to make adjustments on expired commodities in the system, but I was able to assist the facility through AnyDesk, a remote desktop application installed on all eLMIS systems in facilities that allows you to access and control desktops, servers, machines, and devices remotely with the right credentials given to us by the project. The project's resources are incredibly helpful."

The eSCMIS project has trained over 100 MOH eLMIS super users and champions across the country, including Terence. They are embedded in project activities, assisting their respective districts and provinces, and even training other MOH personnel. Building capacity in MOH to manage the eLMIS is a top priority for the project. Our health workers' efficiency is increased by digital capabilities, data analytics, and digital system support and deployment. To ensure sustainability, the project is constantly promoting system adoption and scalability, as well as building capacity in our health system.

"I believe that over time, all MOH commodity management staff will be considered super users of the eLMIS. The system is simple to use," Terence says, "and it improves and streamlines our work. It has made the lives of supply chain managers easier; adopting the system is a no-brainer."

CHALLENGES AND LESSONS SMARTCARE

Challenge: Delays in system integration with SmartCare, due to software programming delays, continue to impede eLMIS use at the dispensary. Partners are requesting that SmartCare and eLMIS FE be integrated as soon as possible to eliminate double entry and reduce MOH staff workload.

Lesson: System integration has the potential to significantly improve data capture and MOH staff workflows. It is critical for teams working on integration to keep MOH and stakeholders updated on progress to avoid frustration due to implementation delays. SmartCare integration made some progress in 2022, but not as quickly as MOH and stakeholders had hoped. The implementation date has been pushed up to 2023, and the integrated team is monitoring progress through a joint workplan and routine meetings.

IMPACT TEAMS FOR DATA ANALYSIS AND USE

Challenge: Power outages and poor internet connectivity have hampered participation in IMPACT team orientation meetings. Because oriented districts were unable to host their first meetings in Q2, the formation of new IMPACT teams at the district level was halted. The inability of district and provincial leaders to meet has been attributed to a lack of financial resources.

Lesson: To ensure long-term sustainability, the IMPACT teams must be integrated into existing MOH structures. The issue has been escalated to MOH headquarters for resolution. The IMPACT teams' strategy is intended to be integrated into existing supply chain management structures or activities after consultation with MOH. The team is awaiting MOH approval on the structure for integration. The timeline for resolution is by March 2023.

MOH/ZAMMSA MANAGEMENT TRANSITIONS

Challenge: Management changes in key government institutions such as the ZAMMSA and MOH have hampered project implementation timelines. The primary activities impacted were the integration of eLMIS with ZAMMSA, and these delays caused a lack of end-to-end visibility.

Lesson: Throughout PY 3, the project continued to work with ZAMMSA to find a solution. The software programming required for integration has been completed. The project is currently awaiting ZAMMSA implementation of SAGE interfaces to integrate SAGE with the eLMIS system and has proposed an interim integration with ZAMMSA's warehouse management system if SAGE is not ready for integration. The buy-in and support of ZAMMSA management are critical to moving forward with this integration.

TELEVISION WHITE SPACE TECHNOLOGIES INITIATIVE

Challenge: Lack of policy and management and technical staff changes at Zambia Information, Communication and Technology Agency significantly slowed progress of implementation and source of funds for television white space technologies. Potential technology partners are hesitant to support this initiative, as it does not fit their business strategy.

Lessons: Television white space technologies is a new innovation in Zambia as well as at the global level. Regulatory policies are not well developed and are critical for implementation and maintenance. This initiative also requires dealing with multiple stakeholders and availability of funding mechanisms that are dependent on proof of concept. The apparent dichotomy along with the project's budget limitations are a challenge that requires careful navigation. Concerted and persuasive effort applied to Zambia Information, Communication and Technology Agency resulted in developing a television white space technologies policy that allows for their use in unserved and underserved locations. The ability to tap into the African television white space technologies working group enabled identification of suppliers and implementers.

SOLAR AND ALTERNATIVE ENERGY SOLUTION

Challenge: Lack of incentives and policies that support purchase of excess electricity generated by homes and businesses. The relatively high capital expenditure of implementing renewable energy and uncertainty of profitability hinder implementation of sustainable solutions.

Lessons: Alternative electricity solutions are capital intensive and do not yet have national policies that incentivize private investment for social good. Realizing desired results takes a long time; however, relentless effort is likely to influence requisite enhancement of regulatory policies and enabling environments. While implementation of small-scale solar equipment for off-the-grid sites has continued, the project is also exploring the ability of sourcing grants for initial implementation of solutions designed for pay-as-you-go business cases. Setup and maintenance would be done in collaboration with private sector partners who could then scale up the concept. The project is currently exploring collaboration with Crown Agents, which has plans to set up renewable energy solutions on a pay-as-you-go business model.

LOOKING FORWARD

The interventions of the USAID eSCMIS project are aimed at ensuring that adequate quantities of acceptable quality health commodities are available at health facilities to meet patient demand. responding in real time with accuracy, speed, and a high-quality product (reducing product wastage and expiry). The interventions' anticipated public health benefits include increased use of health services, a lower disease burden, and improved quality of life for Zambians. The project began work and completed its key deliverables during the

first three fiscal years (2020–2022). Although a number of activities were delayed in the first year, due to COVID-19-related restrictions, the project adjusted and completed most of the expected deliverables in these last two years, making up the time.

During this last project year, the USAID eSCMIS project continued its collaborative efforts with the MOH, USAID, and other implementing partners to ensure the long-term viability of the eLMIS and its rollout across Zambia. The following activities are scheduled to take place in 2023

Objective 1: Implement a next- generation eLMIS

- Use agile software development methodology to incorporate agreed enhancements and changes into the eLMIS software suite.
- Deploy eLMIS FE and training to 166 new health facilities.
- Provide strategic technical assistance solutions to sites with FE and CE users.
- Complete midline evaluation of project activities.
- Provide continuous monitoring, evaluation, and learning activities and adapt interventions to overcome challenges and maximize opportunities.

Objective 2: Enable GRZ to make data-driven supply chain decisions independently

- Complete integration of eLMIS with SmartCare and ZAMMSA.
- Deploy new dashboards and analytics to ensure data are transformed into consumable information at all levels of the health system.
- Reignite IMPACT teams through chief pharmacists to ensure data are analyzed at all levels of the supply chain, resulting in data-driven decisions and actions.

Objective 3: Continue transition of eLMIS activities' leadership to MOH, and ensure GRZ can take ownership of its data and reporting systems

- Update and implement the sustainability and transition plan to enhance the capacity of the GRZ to own and operate the eLMIS.
- Implement key activities from the sustainability and transition plan, such as mapping of required MOH financial and human resources.
- Pilot television white space technologies in two health facilities.
- Rollout the Green Line e-waste initiative.
- Continue initiating other public-private partnerships between GRZ and private companies to increase financial responsibility.