Pre-Formed Panel Abstract Submission

INFORMATION

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Title of Panel: Using Technology to Improve Health Supply Chain and Health Outcomes

Title of Presentation 1 – Improving Supply Chains through Collaboration with the OpenLMIS Initiative:
Session Overview

Title of Presentation 2 – How Innovative Electronic Logistics Management Information Systems Are Improving Decision-Making in Zambia

Title of Presentation 3 – Adapting and Implementing an Electronic Logistics Management Information System in Tanzania

Title of Presentation 4 – The Last Mile of Delivery is the First Mile of Information: Lessons from an OpenLMIS deployment in Mozambique

DESCRIPTION OF WORK

Context and motivation (Please indicate how similar challenges have been addressed in different places or times by other practitioners)

Large populations are unable to access essential healthcare services because of underperforming distribution systems. An important factor contributing to underperforming health system supply chains is the absence of a systematic, comprehensive, and collaborative approach to Logistics Management Information System (LMIS) design and deployment. To date, LMIS solutions for global health have been
loosely coordinated, often focused on a single setting, and/or intended to support only a particular layer of the supply chain, e.g. national stores. Limited resources have been invested in improving the overall supply chain, specifically impacting the flow of information and the flow of medical commodities across all levels, such as from national stores to service delivery points. As a result, global health programs suffer from suboptimal performance, and countries incur additional costs to develop or procure their own “one-off” LMIS solutions.

Recent technology advances have created an opportunity to substantially improve LMIS solutions for supporting health care in low-income countries. Among these are: (1) web-based enterprise applications, which substantially reduce the burden of installing and maintaining software on hundreds or even thousands of workstations; (2) cloud computing, which substantially reduces the requirement for on-staff support personnel; (3) rapid expansion of internet access, which dramatically improves everyone’s ability to exchange data in real time; and (4) powerful, low-cost mobile devices that can support more sophisticated tools for workers throughout the supply chain. By leveraging these technologies, the global health community can deliver new LMIS solutions to improve the performance of supply chains, thereby improving the quality of health care provided to patients.

The OpenLMIS Initiative aims to leverage these advances to develop shared LMIS solutions. OpenLMIS includes a community for sharing information and ideas about logistics, an online repository of resources contributed by the community related to different aspects of global health logistics, and a project to develop an open source LMIS software solution. Development of the OpenLMIS software was guided by requirements from multiple countries, primarily those of Tanzania and Zambia, as determined from their Collaborative Requirements Development Methodology (CRDM) workshops with support from the USAID | DELIVER PROJECT. The system is highly configurable and highly scalable—ultimately a more powerful solution than any one entity could have created. As an open source project, the software is available free of charge, and enhancements are offered to the community for others to use.

The proposed panel will introduce the OpenLMIS initiative followed by presentations on its implementation including requirements building and role of country governments and local stakeholders (e.g. support from national ministries of health), in three countries: Zambia, Tanzania, and Mozambique.

### Methodology and work timeline

**OpenLMIS:**

In 2010, common requirements for LMIS solutions were developed and published. In 2011 this work continued with specific LMIS requirements for Tanzania and Zambia being collected via the Collaborative Requirements Development (CRDM) process. Software development began in late 2012, led by VillageReach and ThoughtWorks, and in late 2013 OpenLMIS v0.9 was released. Software development on the OpenLMIS platform has continued, with version 1.0 being released in July 2014.

**Zambia and Tanzania:**

After the initial release (version 0.9) by VillageReach and ThoughtWorks, the USAID | DELIVER PROJECT
worked to extend the code, adding modules for reporting, data analysis, user interfaces for management of some of the background data, as well as customization of export/import interfaces to exchange data with the MACS warehouse management system (WMS) and the EPICOR enterprise resource planning (ERP) system.

The need to improve upon the existing paper-based logistics system that supports health commodity supply chains in Zambia and Tanzania led to collaboration between the two governments in the development of the eLMIS. The eLMIS links health facilities with the central store to collect and distribute logistics data in real time. Knowing which medicines are used and which medicines are required helps supply chain managers provide continuity of supply for patients.

A facility edition of the eLMIS was also developed by the USAID | DELIVER PROJECT as an open source Windows-installable stand-alone software that can be run in facilities where connectivity to the Internet is unreliable or non-existent. The facility edition automates stock control cards and daily activity registers to capture transactional data at the lowest level of the supply chain, and produces an exportable Report and Requisition (R&R) form for upload to the central eLMIS.

**Mozambique:**

In Mozambique, VillageReach replaced a legacy data collection system for an informed push vaccine distribution system using the OpenLMIS platform, known in Mozambique as *Sistema Electrónico de Logística de Vacinas* (SELV).

Requirements for this system were collected in partnership with the Ministry of Health in early 2013, with software development starting in late 2013. A key requirement was that the system work both online and offline, as connectivity in both provincial capitals and health centers is not consistently available. This functionality was added to the core OpenLMIS platform and released in February 2014.

In spring 2014, the software was tested and configured for Mozambique, and reports needed to support informed push vaccine distribution were added via an offline reporting module. Training was conducted in June and July, and the system is now fully deployed in four provinces. In addition, SELV has also been deployed in a direct-to-digital trial with tablet devices.

**Results**

*OpenLMIS:*

The collaborative approach used in the OpenLMIS development process has involved gathering requirements for multiple countries by various contributors leading to three country implementations to date.

*zambia and Tanzania:*
Employing a comprehensive evaluation plan, the eLMIS will be assessed for supply chain system performance and overall impact on public health commodity management and data management within GRZ. The eLMIS has already served to build international partnerships, as was seen with the governments of Zambia and Tanzania that collaborated to design and build this intervention to address their public health commodity security challenges. It is also a noteworthy medium for strengthening the partnership between the Zambian Ministry of Health (MOH), which dispenses medication, assesses stock levels, and places commodity orders, and MSL, the warehousing and distribution entity that is charged with delivering commodities to the approximately 2,000 pharmacy stores and health facilities throughout Zambia. The eLMIS serves as an avenue for strengthening communication between MOH and MSL by providing a reliable platform for conveying accurate supply chain information for each facility in the country and a faster means for ordering commodities using the logistics management systems implemented by MOH and its staff at all facilities.

The program and impact evaluations of the eLMIS are being carried out at the facility-level and within MSL to determine changes in lead times for the receipt and processing of reports that contain health commodity issues and consumption data for maintaining balanced stock levels at all health facilities throughout the year. Baseline data was collected at MSL and at 40 health facilities that proportionally represent the different types of health facilities supported by the MOH. An evaluation of the eLMIS pilot is currently underway at the 56 service delivery points where it has been implemented, and follow-up evaluation exercises will take place every 6 months as more and more facilities adopt the eLMIS, providing a robust data pool to assess the program’s performance and impact.

**Mozambique:**

Key performance metrics developed through the SELV-enabled data collection include: vaccine stock-out rates; cold chain performance and excursions at health facilities; vaccine delivery intervals to a health facility; wastage rates; vaccine consumption and coverage rates at health facilities and through mobile outreach. All of this information can be filtered down to a specific health center or rolled-up for a province-wide view. The data information chain can thus go both up and down the system, with these performance metrics used by EPI staff for planning and executing monthly distributions runs.

Initial indications show that data completeness and timeliness has improved since the SELV launch. A study evaluating the use of tablets in the field is underway. Qualitative feedback from training sessions indicated that users at the National and Provincial levels are very interested in the ability to monitor facility stock-outs in SELV. Continued evaluation will focus on evaluating data use and behavior change in response to the rich data available on the SELV platform.

SELV is aimed at helping people and users not only collect and access data related to logistics, but also in understanding this data for utilization and improvement. Sharing our knowledge base and experience on the OpenLMIS deployment in Mozambique will be equally beneficial to other participants grappling with the question: “what is the optimum level of data needed to make a supply chain work better at improving health outcomes, and how do we get it?”
Conclusion / Interpretation

OpenLMIS is a multifunctional and innovative intervention for providing evidence-based, real-time decision-making through increased data accuracy and visibility. The OpenLMIS platform will provide the means for measuring health commodity supply chain performance and determining trends and areas for improvement through policy in countries such as Zambia, Mozambique, and Tanzania. Finally, OpenLMIS promotes health system strengthening and capacity building within the health sector government bodies by allowing for measuring health system performance, increasing program monitoring skills, and complementing the logistics management systems already in place, thereby improving commodity security and patient care. The OpenLMIS systems will significantly decrease the amount of time required for critical supply chain data to reach higher-level decision makers, and will minimize discrepancies in data that often result from human error. This will increase supply chain data quality and visibility, while improving timeliness of data management and reporting. Such improvements will enable real-time, evidence-based decision-making for country governments and central medical stores.

Outline of Presentation

Presentation 1: Overview – Applying technology to strengthen supply chain and improve health outcomes, OpenLMIS Initiative
Presentation 2: Zambia Implementation
Presentation 3: Tanzania Implementation
Presentation 4: Mozambique Implementation

Each country-specific presentation will include:
- Problem statement
- Summary of the solution deployed
- Challenges encountered
- Lessons learned

Key Material (Please include existing slides if available, annotated with expected differences where necessary)

Statement of relevance (applicability to conference theme and potential benefits to participants)

The story of how Zambia, Tanzania, and Mozambique used a new technology, OpenLMIS, to build innovative electronic logistics management systems is an important one for any country seeking to make better supply chain decisions through increased data accuracy and visibility.

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