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Supply Chain Management Newsletter

Challenges such as inadequate training, high staff turnover, and inefficient system design make logisitcs data hard to come by. To tackle these long-standing challenges, new approaches are needed. One emerging tool showing great promise is the mobile device

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The Future Is Mobile

At the community level of any supply chain, the simplest innovation may offer the greatest opportunity to create lasting performance improvements. Undertaking incremental changes in processes by instilling elements of a quality improvement approach empowers health workers to identify and implement solutions for their specific and unique problems. See the full article below.

Supply Chain Software in 30 Countries

The USAID | DELIVER PROJECT website now houses information about the supply chain management software being used in 30 countries. In 2012, the project conducted a survey to collect data from 54 software applications at different levels of the supply chain. See the full article below.

Linking to the Last Mile: Timely Logistics Data for Community Case Management Supply Chains

Understanding the strong correlation between improved data visibility and better supply chain decisionmaking, the Supply Chains 4 Community Case Management project worked with their MOH counterparts and an information technology vendor to develop cStock, which provides managers with essential community health worker logistics data in real-time. See the full article below.

10 Years of Delivery Team Topping Up

Ten years ago, Zimbabwe's Delivery Team Topping Up (DTTU) system made its first delivery runs to bring supplies to health facilities; the system has since proven itself as one of the most effective and robust supply chain solutions in the history of the USAID | DELIVER PROJECT. See the full article below.

mHealth Summit 2012

The 2012 mHealth Summit reflected how the evolving use of mobile technology is improving health outcomes. See the full article below.

The Future Is Mobile

Well-functioning supply chains require data. Clear information about available stock, consumption rates, and any losses and adjustments are necessary to make good decisions to ensure that medicines and products are available, when and where they are needed. There are many reasons why logistics data are hard to come by, ranging from inadequate training and high staff turnover, to inefficient system design and a lack of transport; and these problems are compounded in resource-poor settings. To tackle these long-standing challenges, new approaches are needed for data reporting, and one emerging tool showing great promise is the mobile device.

Worldwide, there are more than 3.2 billion unique mobile subscribers.1 Sub-Saharan Africa is the fastest growing mobile market in the world, with an average annual growth rate of 44 percent since the year 20002, and mobile phone subscriber penetration in Africa is expected to surpass 80 percent this quarter.3 Similar burgeoning mobile adoption can be found consistently across low- and middle-income countries throughout Asia and South America. Mobile devices are considered a "leap-frogging" technology, widely used even in areas that lack fixed telephone lines or consistent electricity.

Supply chains across the globe are taking advantage of the ubiquity of these mobile devices, which, even at their most basic, can be considered tiny, networked computers. Phones, tablets, and netbooks are being used to track the flow of commodities, report stockouts, and map availability. Mobile supply chain solutions leverage the familiarity that supply chain workers already have with these devices, taking simple technology, such as SMS (or text-messaging), and using them to open up visibility of the supply chain even at the last mile, reporting information from lower level health facilities and community health workers. Dynamic websites with near real-time supply information provide much needed data to decisionmakers and supervisors upstream.

This issue of the SCM Newsletter focuses on a number of promising mobile supply chain interventions, which are quickly becoming a preferred approach to data collection, tracking, and reporting. Mobile systems such as ILSGateway in Tanzania, the Early Warning System in Ghana, and cStock in Malawi are being taken to scale in the coming year, having demonstrated an ability to consistently provide crucial supply chain data that were previously intermittent, late, or unreliable.

Mobile supply chains have their own challenges, and although not a panacea for every problem that leads to stockouts of needed medicines and commodities, they are an important new tool for effectively managing supply chains when designed and deployed with care..

A Sampling of Innovative Technology

Ghana – Early Warning System for Supply Chains

The mobile phone-based Early Warning System (EWS) began in July 2011 when it was piloted in over 200 health facilities in all 10 regions of Ghana. Having subsequently conducted an assessment, Ghana Health Service is now expanding implementation to approximately 200 additional facilities including all ART sites nationwide and all health facilities in several selected districts. Using recent advances in mobile technology, the system enhances logistics data reporting, visibility, and utilization to improve the supply chain. With EWS, health facility staff use mobile phones to report stock levels of 27 tracer commodities (HIV, malaria, and family planning), via SMS, to a dedicated short code on a weekly basis. By logging in to the EWS website, Regional Medical Stores also input their stock levels for the 27 tracer commodities. Data is

processed and immediately made available to all relevant stakeholders, service providers, and program managers through the EWS web interface. This information helps managers intervene when there are problems and determine appropriate interventions to improve the availability of health products. With the introduction of EWS, the proportion of facilities that have stocked out of any commodity decreased from 32% in July 2011 to 24% by November 2011. It is believed that stockout rates would have been even lower in the absence of fluctuating availability at the national level during that period.

This project is implemented by the USAID | DELIVER PROJECT and the USAID Focus Regions Health Project (FRHP) in collaboration with the Ghana Health Service.

Guatemala – Reporting Logistics Data with SMS

A key challenge for the public health supply chain in Guatemala is data visibility around consumption rates and available stock of vaccines, contraceptives, micronutrients, and essential drugs at the health facility level. Reporting rates from health facilities are low due to challenges of the logistics information system and infrastructure, and the aggregation and analysis of the fragmented data that is reported is time consuming, reducing its usefulness for decisionmaking and program management. In July 2012, the USAID| DELIVER PROJECT initiated ILMOVIL, a pilot project with the Health District of San Marcos, Guatemala, to improve data-driven decisionmaking. The pilot uses simple mobile phone-based technology that allows each health post to send weekly SMS messages containing essential logistics data for 12 products across four programs (family planning, immunizations, nutrition and essential medicines.) The incoming data is loaded into an Excel dashboard that produces standard supply chain indicators, such as average months of consumption and months of stock. The pilot is in its first stage, and efforts are underway to evaluate it and determine the feasibility of taking it to a larger scale, in collaboration with the logistics unit and third parties, including the Fundacion Tigo.

This project is implemented by the USAID | DELIVER PROJECT in collaboration with the Logistics Unit and the Family Planning, Immunizations and Nutrition Programs of the Ministry of Health of Guatemala (MSPAS), and the Health District of San Marcos.

India – Mobile Micronutrient Supply Chain Solution

In 2012, John Snow, Inc. partnered with the Micronutrient Initiative and software consulting company Dimagi to conduct an assessment of the micronutrient supply chain in Gujarat, India. The group developed a concept and project plan for creating a mobile supply chain information system to provide real-time stock status information for select commodities, improve the timeliness and accuracy of paper-based reporting and reporting from village health workers, and improve tracking of treatment outcomes for diarrhea in children under the age of five. The proposed system will enable the collection of stock data and treatment information via mobile phones from users at various levels in the public health system. The data will be routed to a cloud-based server that will store the information and display it via easy to use web reports; any supervisor or higher-tiered worker will be able to view data collected for the primary health center and below. Initially, the focus will be on oral rehydration solution and zinc products, but the system can also accommodate reporting on different commodities that each user has at their disposal, as well as limited information on diarrhea treatment.

This project is implemented by John Snow, Inc. and Dimagi, in collaboration with the Micronutrient Initiative.

Liberia – Food Aid Beneficiary Registration with Mobile Phones

In Liberia, mobile phones are being used in reducing food insecurity and chronic malnutrition of vulnerable women and children. The USAID/Food For Peace Title II-funded Liberian Agricultural Upgrading, Nutrition and Child Health (LAUNCH) project distributes food rations to pregnant and lactating women and children under two. In early 2012, LAUNCH streamlined the beneficiary registration process with mobile phones using the EpiSurveyor software. The previous paper-based registration process was prone to lost forms, data entry errors, and difficulties in supervision. By entering and sending beneficiary registration

information electronically, LAUNCH field staff can now provide the Monrovia-based commodity team with real time data that is merged into a central database. The system has dramatically decreased wait-time for receiving food rations (from an average of 14.1 to 4.7 weeks), while increasing beneficiary enrollment (from an average of 607 to 847 registrants monthly). In addition, the commodity team found that the reduction in paperwork and data handling has impacted the entire supply system, making the food distribution process more efficient. The mobile system has also allowed the Monrovia-based supervisors to better track and monitor the performance of field staff. The system has needed little modification since its inception and all registration is now mobile-based.

The Liberia Agricultural Upgrading Nutrition and Child Health (LAUNCH) project is implemented by ACDI/VOCA, in partnership with PCI; John Snow, Inc.; and Making Cents.

Tanzania – Moving Data with Mobile Phones

In 2010, the USAID | DELIVER PROJECT worked with the Ministry of Health and Social Welfare (MOHSW) to develop Tanzania's ILSGateway, a mobile phone-based alert and reporting system for collecting logistics data within the public health sector. The system provides key decisionmakers with access to detailed logistics information on reporting rates, inventory, supervision, and delivery timeliness of 20 essential health commodities in Tanzania's Integrated Logistics System (ILS). So far, more than 1,600 public health facilities across the country—approximately a third of all facilities—are using the system, and a national scale-up is underway. ILSGateway takes advantage of the near ubiquity of mobile phones and the fact that all networks in Tanzania provide SMS service. Health facility staff use their personal mobile phones to receive and send text messages, which makes it convenient for staff, while keeping down the cost of maintaining the system. The messages are sent to a toll-free, five-digit short code, and data is automatically loaded into a server that analyzes and displays data dashboards to a secure, user friendly website. Supply chain managers and other stakeholders can access this real-time data whenever they need it, and monthly SMS and email summary reports are also sent to district, regional, and central level staff. View the infographic.

This project is implemented by the Tanzania Ministry of Health and Social Welfare, John Snow, Inc., and Dimagi, with funding from the USAID | DELIVER PROJECT.

Zimbabwe – Using Images to Transmit Logistics Data

While 90 percent of antiretroviral therapy (ART) sites in Zimbabwe report their antiretroviral (ARV) logistics data, only 60 percent of these reports are received on time. To increase on-time reporting rates, the Supply Chain Management System project, in collaboration with the Zimbabwe Ministry of Health and Child Welfare, is trying out a new system that takes advantage of the ubiquity of the mobile phone network to transmit antiretroviral (ARV) logistics data via images captured on mobile phones. This pilot project, which began in mid-2011, includes 11 ART sites. Facility staff fill out their logistics forms manually according to their reporting cycle and then take photographs of the completed forms with a camera phone. Using phone applications like multi-media messaging (MMS) and Whatsapp, the images of the forms are sent directly to the Logistics Unit at the central level, where the information is recorded and used for decisionmaking. By sending the information over the mobile phone network, the pilot aims to address the issue of timely reporting.

This project is implemented by the USAID-funded Supply Chain Management System (SCMS) project in collaboration with the Zimbabwe Ministry of Health and Child Welfare.

Supply Chain Software in 30 Countries

The USAID | DELIVER PROJECT website now houses information about the supply chain management software being used in 30 countries. In 2012, the project conducted a survey to collect data from 54 software applications at different levels of the supply chain. Program managers can use the survey data to make decisions about software implementations in their countries; implementing organizations and USAID Missions may also find the information useful.

Access the supply chain software survey

See also, *Computerizing Logistics Management Information Systems: A Program Manager's Guide*

http://deliver.jsi.com/dlvr_content/resources/allpubs/guidelines/CompLMIS_PMG.pdf

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Linking to the Last Mile: Timely Logistics Data for Community Case Management Supply Chains

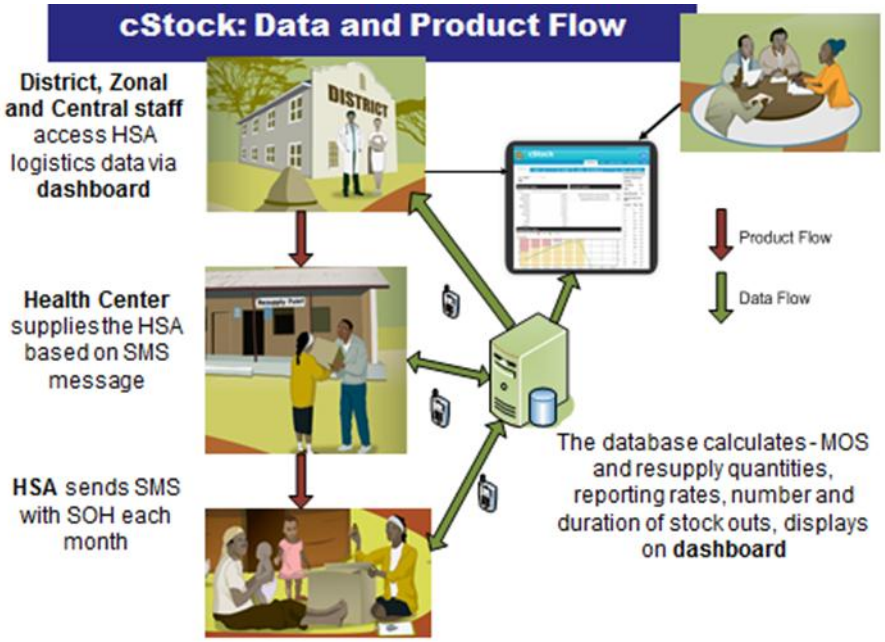
cStock provides real-time, actionable logistics data from community health workers. Managers and stakeholders use this data to coordinate, plan, and identify solutions to better meet customer needs.

"Messages sent via cStock connect staff at all levels," explains the supervisor at Ofesi Health Center in Kasungu, Malawi. Kasungu is one of eight districts in Malawi using cStock, an open source, rapid short message service (SMS), web-based logistics management information system (LMIS), developed by the Supply Chains 4 Community Case Management (SC4CCM) project.

In 2010, as part of a baseline survey of the community health supply chain in Malawi, SC4CCM found that only 43 percent of community health workers (called HSAs in Malawi) reported any logistics data; only 14 percent of the data were available at the district level, where key product purchasing decisions are made. Poor data visibility often undermines decisionmaking throughout the supply chain, which affects supply chain performance and, ultimately, affects product availability.

In Malawi, a key priority of the Ministry of Health (MOH) was to make progress toward achieving Millennium Development Goal 4—reducing child mortality. Poor product availability was identified as an important challenge for the HSAs' ability to treat sick children. HSAs in Malawi prevent, diagnose, and treat a number of conditions, including diarrhea, pneumonia, and malaria in children under five, as part of a package of services called Community Case Management (CCM).

The data collected in the baseline survey revealed an opportunity by demonstrating a high level of connectivity: 94 percent of HSAs who managed health products had a mobile phone; and 85 percent had network coverage, at least some of the time. Understanding the strong correlation between improved data visibility and better supply chain decisionmaking—and, consequently, the potential for improving product availability—SC4CCM worked with their MOH counterparts and an information technology vendor to develop cStock



What does cStock do?

To facilitate supply chain decisionmaking, cStock provides managers with essential HSA logistics data in real-time. cStock uses the stock data, reported by HSAs, to calculate and transmit resupply quantities for each HSA via SMS to the health centers where HSAs collect their products. Health center staff notify the HSAs and pre-pack orders; when HSAs arrive to pick up the orders, they are ready. If items are out of stock, staff notify the HSAs; this prevents HSAs from making a wasted trip. After collecting their orders, the HSAs confirm quantities received through SMS; this completes the feedback loop. cStock then generates performance and feedback reports for managers. District managers use web-based reports to monitor the supply chain performance for all HSAs in their district; they also support health centers to meet HSA needs.

Information from cStock increases efficiency and effectiveness within the supply chain:

- Automatic calculation of resupply quantities reduces the calculation burden for health center staff.
- Resupply data available before the HSA arrives to collect supplies reduces HSA wait time and unnecessary travel because health center staff can organize supplies before the HSA arrives or can notify them of a stockout.
- Monitoring the stock levels enables supply chain managers to quickly identify and respond to emergency stock levels and stockout situations at both the health center and HSA level.
- When the HSA level has more accurate and complete logistics data, the robustness of quantification and supply plans for CCM and other community health-level products increases.

Monitoring

Monitoring results have shown a significant adoption of cStock—an 87 percent reporting rate after 12–15 months, reduced lead times, and improved product availability. HSAs report feeling less isolated; they also cite improved relationships with their supervisors because of the rapid feedback from cStock. Districts receive alerts and use data to follow up with health centers on specific HSA issues.

Managers use the online dashboard to review stock-level information.

Foundation for Success: Key Design Features

In Malawi, cStock has rapidly grown in popularity—more rapidly than other eHealth systems that have been piloted in recent years. In November 2012, senior Ministry of Health (MOH) managers endorsed cStock as the LMIS of choice for the community level; the MOH and its partners have started to plan and undertake a nationwide roll-out. The following system elements contributed to the successful uptake and participation:

- Use of basic Global System for Mobile Communications (GSM) phones already owned by HSAs.
- Collection of only the minimum logistics data needed—stock on hand and receipts—while offering a range of feedback and performance reports for managers; including indicators on reporting, inventory and stockout rates, lead time, order fill rates, and calculated consumption levels.
- Inclusion of reminders for HSAs to report, and alerts to notify higher levels of unresolved stock issues, thereby triggering important actions.
- Presentation of data in simple, easy-to-read reports that can be used for follow-up without significant further analysis.
- Upgrades to the system after six months to customize reports and add new features, informed by seasoned users.
- Addition of a new group messaging feature to address system and user errors and provide users with immediate feedback to improve data quality and reinforce skills and procedures. Reporting completeness improved from less than 50 percent at implementation in January 2011 to 75 percent in December 2012; in large part, due to feedback provided through the group messaging feature.

Sustainability

Today, more than 1,000 HSAs in eight districts are using cStock. Roll-out to seven additional districts is planned for the first quarter of 2013; the MOH expects a nationwide deployment by late 2013. To help plan for the scale-up of cStock, SC4CCM worked with the MOH to develop a transition and scale-up paper that clearly outlines the technical, administrative, and financial requirements that the MOH and partners need to achieve a successful and sustainable cStock scale-up in the remaining districts.

To enable other countries and programs to use cStock, it was designed to be adaptable and customizable. Implementation involves only a few basic requirements: simple mobile phones and access to GSM network coverage for HSAs and health center and district staff. Health center and district staff who review the web-based data need regular computer and Internet access.

A key benefit of cStock is its ability to maximize community health workers' time by providing critical services. Because cStock can notify the HSA when medicines are available at the health center, the HSA only travels to the health center when the products are available. When they do not need to walk or bike long distances for unnecessary trips to the health center, HSAs have more time to serve the children and families in their communities. cStock links the HSA to the rest of a country's CCM supply chain, and it enables stock information to be connected at all levels.

For more information, visit sc4ccm.jsi.com, follow the project on Twitter @SC4CCM, and watch videos at http://www.youtube.com/user/SC4CCM.

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10 Years of Delivery Team Topping Up

Ten years ago, Zimbabwe's Delivery Team Topping Up (DTTU) system made its first delivery runs to bring supplies to health facilities; the system has since proven itself as one of the most effective and robust supply chain solutions in the history of the USAID | DELIVER PROJECT and its predecessors. With very little interruption, DTTU trucks have rolled out at to make deliveries to the country's more than 1,300 public sector health facilities, maintaining high delivery coverage, and low stockout rates.

Based on vendor-managed inventory (VMI) principles (a concept used extensively in the commercial sector), DTTU routinely supplies all public sector health facilities with condoms, contraceptives, and other health commodities by sending delivery trucks directly to facilities to "top up" supplies and collect stock data (see side bar).

How Does DTTU Work?

With DTTU, facility staff do not place orders. Delivery trucks are loaded with products based on past consumption. The delivery team (a team leader and a truck driver) travels to health facilities to "top up" each facility with the products needed to meet the next period's requirements. At the facility, the delivery team—

- questions facility staff about losses and adjustments and days out of stock
- carries out physical counts of commodities
- calculates the average monthly consumption
- calculates the maximum quantity for the facility
- tops up the facility to maximum

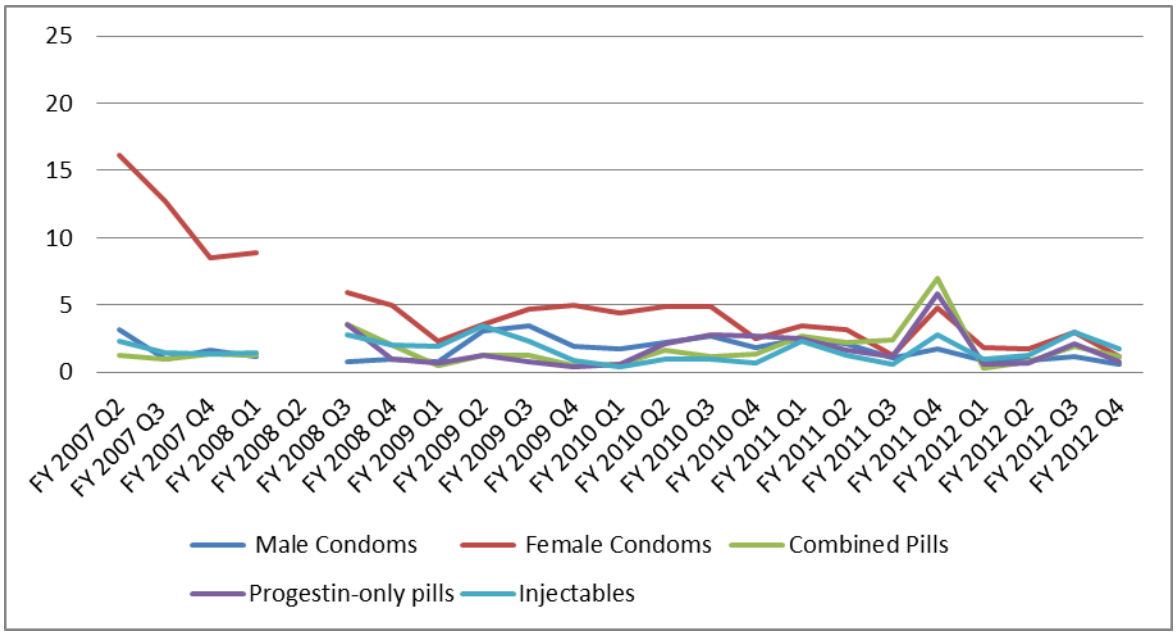
Expansion to More Commodities

Resulting from a transport assessment for HIV and AIDS commodities, the DTTU system was piloted in 2003, and nationwide implementation began the following year. DTTU began with distribution of condoms and contraceptives. Seeing the successful reduction of stockout rates, and the benefits of having national-level data for consumption and stock on hand, other programs became interested in using the DTTU system. In 2007, HIV rapid test kits, syphilis rapid test kits, and nevirapine for the prevention of mother to child transmission (PMTCT) of HIV were included. When the Ministry of Health and Child Welfare (MOHCW) updated their PMTCT guidelines to include full highly active antiretroviral therapy for HIV positive women in 2009, more products were added into the DTTU system. Most recently, in 2011, CD4 point of care commodities, and commodities required for early infant diagnosis of HIV were also included.

Despite operating in a challenging environment, DTTU has been a high-performing supply chain with high delivery rates and very few stockouts. In 2007 and 2008, the country experienced hyperinflation, which negatively affected program capacities. In April 2007, the parallel foreign exchange rate was 30,000 Zimbabwe Dollars (ZWD) to 1 US Dollar (USD). By the end of 2007, the rate had fallen to 2,000,000 ZWD to 1 USD, and by May 2008, the rate was 200,000,000 ZWD to 1 USD. During this time, there were fuel shortages and high unemployment rates, which led to an exodus of skilled workers, including significant numbers of health workers, and many positions were vacant.

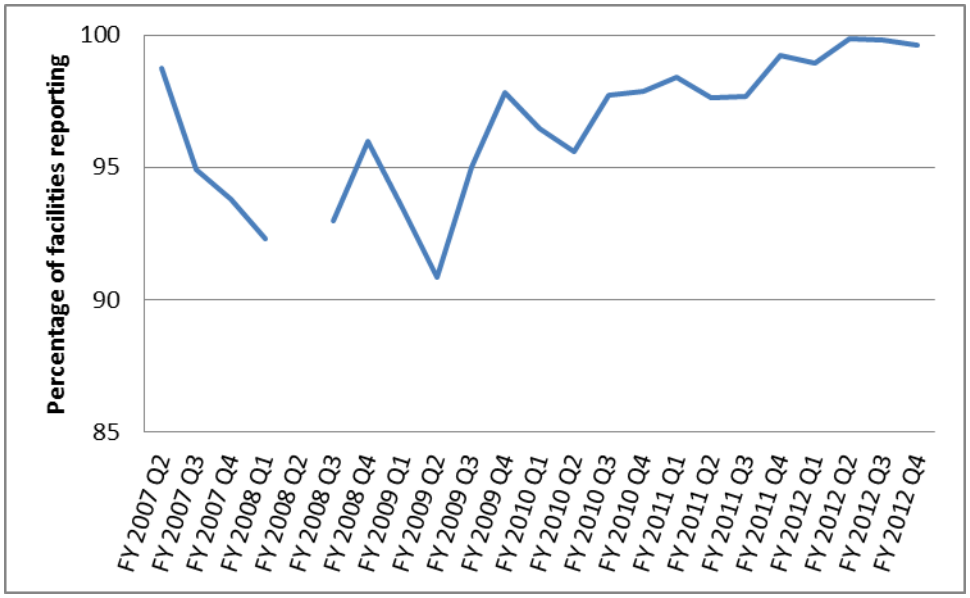
During these crisis years, only one scheduled delivery, in 2008, did not take place. Since 2007, the percentage of facilities stocked out of a particular product has been very low, for the most part less than 5 percent (see Figure 1). In DTTU, as facility staff do not place orders, the delivery coverage rate is the same as the reporting rate; that is, if a facility receives a delivery, then data from that facility are captured. Since 2007, the coverage/reporting rates have usually been between 95 and 100 percent. The lowest reporting rate was 91 percent (see Figure 2).

Figure 1. Facility Stockout Rates 2007–2012



Note: no deliveries were made in the second quarter of 2008.

Figure 2. Coverage/Reporting Rates 2007–2012



Note: no deliveries were made in the second quarter of 2008.

Automating Data Collection

When DTTU was first implemented, all data collection and calculations were done manually, using the Delivery/Receipt Voucher (DRV). Upon completing a delivery, team leaders submitted paper DRVs to the project office, which were then manually entered into the central level software—Top Up. In 2008, the data collection was automated. Team leaders began to travel with laptops that had an electronic version of the Delivery/Receipt Voucher (AutoDRV). Calculations were no longer done at the facility, and only three types of data from the facility needed to be entered: adjustments, physical count, and days out of stock. After the delivery was completed, team leaders returned the laptops to the central level, and the data was downloaded directly to the Top Up software. The Top Up software aggregated and analyzed national logistics data, and reports were disseminated to stakeholders.

Since automating the data collection, delivery teams spend less time at a facility, and there are no manual calculation errors. Data validations are done in the field to alert team leaders to errors, and data accuracy has greatly improved at the facility level. Team leaders also reported that using laptops motivated them. At the central level, data entry time was eliminated, as were data recapturing errors, because of the automatic download from AutoDRV to Top Up. Report generation time was reduced from 2 weeks to 2 days.

Application to Other Systems

Enthused by the success of the DTTU, in 2009 the MOHCW designed and implemented another logistics system, which was based on DTTU system design principles and parameters. The Zimbabwe Informed Push/Primary Health Care Packages system (ZIP/PHCP) delivers malaria and tuberculosis medicines, and other essential medicines to every public sector facility in the country. ZIP is managed by the Directorate of Pharmacy Services, with support from UNICEF, the USAID | DELIVER PROJECT, and Crown Agents Zimbabwe. VMI systems, such as DTTU, can be successful in a variety of contexts and has gained recognition as a viable alternative for public health sector supply chain models. In 2011, a decision was made to pilot a VMI system in two states in Nigeria. The initial deliveries are scheduled to take place in 2012.

The Delivery Team Topping Up (DTTU) system was implemented by the USAID | DELIVER PROJECT in partnership with the Zimbabwe National Family Planning Council (ZNFPC), the National Pharmaceutical Company (NatPharm), the UK's Department for International Development (DFID), and Crown Agents Zimbabwe.

For more information:
Video: Information Highway to Health
Delivery Team Topping Up: Bringing About Reliable Distribution in Difficult Environments

mHealth Summit 2012

On December 3-5, just outside Washington, DC, more than 4,000 participants, from 56 countries, convened at the 2012 mHealth Summit. The conference reflected how the evolving use of mobile technology is improving health outcomes. A wide variety of sessions were offered—topics ranged from the state of evidence and scientific research for mHealth; to the use of information and communications technology (ICT) for specific disease categories, such as HIV and AIDS or pulmonary diseases; to questions around privacy and security; to policy and regulatory considerations. This year marked the first time that the mHealth Summit organized a specific conference track for global health, which was aimed at mHealth efforts to improve health outcomes in low- and middle-income countries.

As a part of a panel, "The Road Ahead: The Future of Mobile Technologies for Global Health," economist Jeffrey Sachs stated that "supply chain management is obviously an area where mobile is the future." He emphasized the role that mobile technologies can play in capturing and reporting crucial data in areas where other technologies are not available, and where traditional approaches have proven to be unreliable and inadequate. He specifically referenced the role that mHealth can have with community health workers, arguing that "empowering community health workers with mobile tech is the single most important strategic approach." Sachs' remarks about the link between mobile technologies and supply chains echoed those made by Bill Gates during his keynote address at the second mHealth Summit, where he listed health supply chains as one of the key areas where mobile technology will have the biggest impact.

Several sessions at the conference featured supply chain innovations using mobile technology for reporting and data gathering. Discussions about how to best leverage these new approaches focused on the need for standards and interoperability between systems, and the key factors supporting sustainability and scalability. Some recommendations included remembering that technology is just one component of the success of these approaches. It is equally important to focus on how the technology will be integrated into existing operating procedures, revising and optimizing business processes, and managing change.

More mHealth Resources

http://www.mhealthworkinggroup.org/
http://www.mhealthalliance.org/
http://www.healthunbound.org/
http://www.hingx.org/
http://mobilegovwiki.howto.gov/
http://mobithinking.com/mobile-marketing-tools/latest-mobile-stats

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