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FROM THE AMERICAN PEOPLE



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USAID | DELIVER PROJECT, Task Order 4

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Abstract

This report describes the activities and achievements of the USAID | DELIVER PROJECT, Task Order 4 from October 1, 2011 to September 30, 2012. The project works to improve the lives of men, women, and families by strengthening the supply chains that deliver health commodities, developing sustainable national capacity and ownership for operating the supply chain, and cultivating enabling environments for contraceptive security (CS).

Cover photos:

Kalsoon Bashir, a Lady Health Worker explains the use of on Megestron injection to her clients, Mr. and Mrs. Javeed Zahoor Maseeh, in Shaid Colony, Lahore, Pakistan. Photographer: Derek Brown for USAID.

Delivery Team Topping Up staff members unload contraceptives and other health commodities in Zimbabwe. USAID | DELIVER PROJECT.

USAID | DELIVER PROJECT

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Acronyms

3PL	third party logistics providers
AFP	Advance Family Planning
AIDS	acquired immune deficiency syndrome
ART	antiretroviral therapy
ARV	antiretroviral
CARhs	Coordinated Assistance for Reproductive Health Supplies
CMAM	<i>Central de Medicamentos e Artigos Médicos</i>
CMS	Central Medical Store
CS	contraceptive security
CYP	couple-years of protection
DDIC	Direct Delivery and Information Capture
DHS	Demographic and Health Survey
DTTU	Delivery Team Topping Up
ESAMI	Eastern and Southern Management Institute
eLMIS	electronic logistics management information systems
EUV	End-Use verification
EWS	Early Warning System
FY	fiscal year
GIS	geographic information system
HCMIS	health commodity management information system
HIV	human immunodeficiency virus
IAPHL	International Association of Public Health Logisticians
ILS	Integrated Logistics System
IRH	Institute of Reproductive Health
IUD	intrauterine device
LMIS	logistics management information system
LMU	Logistics Management Unit
mHealth	mobile health
MOH	Ministry of Health
MSL	Medical Stores Limited
NUM	New and Underutilized Method
PBF	performance-based financing
PFSA	Pharmaceutical Fund and Supply Agency
PPMR	Procurement Planning and Monitoring Report
PtD	People that Deliver
PSI	Population Services International

RHSC	Reproductive Health Supplies Coalition
RMA	Resource Mobilization and Awareness
SCM	supply chain management
SCMS	Supply Chain Management System (project)
SDP	service delivery point
SMS	short message service
STTA	short-term technical assistance
TA	technical assistance
UPS	United Parcel Service
USAID	U.S. Agency for International Development
VMI	vendor managed inventory



Introduction

Our approach:

- Focus on improving health.
- Use evidence to drive action.
- Find innovative solutions for persistent problems.
- Link programs and supply chains.
- Leverage global and local partnership efforts.
- Build local capacities and increase country ownership.
- Produce measurable results.

The reliable availability of essential health commodities, including contraceptives and condoms, contribute to strong family planning programs and positive health outcomes. The USAID | DELIVER PROJECT, Task Order 4, improves the lives of men, women, and families by strengthening the supply chains that deliver health commodities, developing sustainable national capacity and ownership for operating the supply chain, and cultivating enabling environments for contraceptive security (CS). We also support these efforts by disseminating supply chain best practices and building the evidence base to inform global, regional, and national advocacy for investments in commodities and supply chains.

In fiscal year (FY)2012, the project worked with local partners through country offices in 18 countries—including two country programs that closed during the year—and provided short-term technical assistance (STTA) to 15 others. This year, we focused on increasingly rigorous analyses, on maximizing return on investment and adapting private-sector strategies, and on identifying and applying innovative approaches and technologies. The project identified an approach to end-to-end supply chain integration that highlights the cascading effects of data visibility throughout the supply chain, builds on lessons and innovations from the private sector, and incorporates the automation and use of mobile devices. We continued to support our in-country partners in building and operating flexible high-performing supply chains, while augmenting this work with modeling exercises to help countries better prepare for future challenges. We collaborated with host country officials to promote sustainability and ownership in leveraging local financial resources and strengthening local capacity to build and operate adaptable, transparent, functioning supply chains. The project

has provided ongoing intellectual leadership; identifying and filling strategic information gaps by compiling and translating data to support evidence-based decisions and advocacy efforts that are grounded in field realities.

Results

Visibility into facility-level product availability remains high because of routine reporting and supervision systems in key presence countries. Reporting rates from the service delivery point (SDP)-level have remained consistently high, averaging around or above 80 percent for most countries, reflecting strong and robust logistics management information systems (LMISs).

Similarly, product availability for key contraceptive methods remains high—the result of strong supply chains and routine monitoring, reporting, and supervision systems. To monitor product availability and the performance of the supply chain, over time, the project routinely collects and analyzes key supply chain performance indicators for most of the project-presence countries.

Two unprecedented analyses this year underscored the importance of our work by demonstrating the impact of product availability on contraceptive use and on key measures of maternal and child health:

- Through an analysis conducted in FY2012, the project determined that between FY2009–2012, in 22 of the Office of Population and Reproductive Health priority countries, the project shipped enough contraceptives to provide more than 75 million couple-years of protection (CYP), potentially preventing an estimated 22 million unintended pregnancies; more than 665,000

infant deaths; and over 39,000 maternal deaths. These results are being used to advocate for investments in supply chains and to stress the importance of commodity security in achieving these critical maternal and child health outcomes.

- Another analysis of the *MEASURE Demographic and Health Survey* (DHS) and LMIS data showed that the increasing trend in contraceptive use in Rwanda, as shown in the DHS (DHS and ICF 2012), corresponds to the same increasing trend in contraceptives dispensed to clients from 2005–2010. With stockout rates below 10 percent for most contraceptives, and reporting rates above 90 percent across the country, these data show that the highly efficient public-sector supply chain in Rwanda has responded to increasing demand over the past five to seven years, keeping products reliably available across the country; and enabling Rwandan women to choose, obtain, and use contraceptives whenever and wherever they want.



In most project-presence countries, the three highest-demand resupply methods—condoms, injectables, and pills—are routinely available to clients at service delivery points. This indicates good supply chain performance for the countries that receive project support. For all three methods, almost all reporting countries have maintained low stockout rates; on average, at or below 10 percent, with few exceptions.



System Strengthening for Health Impact

Highlights:

- In Tanzania, after expanding the ILSGateway, the advances in mHealth increased visibility to 1,600 facilities.
- The adapted commercial-sector model for supply chain evolution showed a long-term vision of supply chain strengthening in developing countries' public health.
- The increased use of geography and modeling supports informed decisionmaking.

Public health supply chains in developing countries are unique, handling thousands of stockkeeping units that are delivered to thousands of dispensing points. To respond to changing environments, systems need to be adaptable and flexible. Countries must manage an increasing range and volume of commodities, as well as ongoing health sector reform efforts to integrate or decentralize various functions.

The project's approach to end-to-end supply chain integration frames the growing need to automate LMISs and to facilitate data visibility along the entire system—from client to manufacturer and beyond. Well-functioning (integrated) supply chains are characterized by clear roles and responsibilities, agility, streamlined processes, visibility of information, trust and collaboration, and alignment of objectives. End-to-end visibility is crucial for supply chain operators if they are to make informed decisions and ensure supplies are where they need to be in the system.

The project has pursued a number of approaches to improve data visibility and to effectively link the last mile to the first mile: global coordination and monitoring, electronic LMIS (eLMIS), mobile health (mHealth) technologies, and geographic information system (GIS) mapping and analysis. In addition, we have explored adapting private-sector tools for public health; including costing analysis and modeling, as well as engaging the commercial sector in operating public-health supply chains.

As a key indicator of the project's effort to create sustained capacity in logistics operations during FY2012, 10 project-assisted countries completed the forecasting and procurement planning process and submitted their supply plans for USAID-procured contraceptives and condoms. Forty percent (4 out of 10) of these countries—Ethiopia, Liberia, Malawi, and Pakistan—received STTA during



Warehouse personnel load commodities for shipment to health facilities in Malawi.

this home office exercise. The results reflect the degree to which national counterparts are able to forecast commodity needs and develop supply plans without external technical assistance (TA), except for the TA provided by the local project staff based in each country.

To update their plans, countries carry out a key monitoring function by reviewing procurement plans semi-annually against their current stock and planned orders. Twelve out of 14 project-presence countries (86 percent) reviewed their procurement plans for family planning products, at least semi-annually.

To determine accurate future commodity needs, countries that have functioning logistics systems, and that use their logistics data for forecasting, perform much better in this

analysis than those that rely only on demographic data, or those with poor logistics systems for contraceptives. For example, most of the countries with the highest error rates, as tracked by the project—Liberia, Malawi, Tanzania, and Zambia—rely on a mix of central-level logistics data and demographic data for forecasting. See appendix A for details on forecast accuracy.

Global Coordination and Monitoring: The Procurement Planning and Monitoring Report and the CARhs Group

Since 2007, the project has compiled stock status data, as reported by countries, and shared it in a standardized format—the Procurement Planning and Monitoring Report (PPMR)—with the Coordinated Assistance for Reproductive health supplies (CARhs) group. This visibility into national contraceptive supply chains enables this global group of donors to monitor and respond to supply emergencies and to coordinate more efficient allocation of resources. In FY2012, the number of countries reporting in the PPMR increased dramatically—from 22 at the end of FY2011 to 38 countries during FY2012. However, during FY2012, six countries—Burundi, Honduras, Madagascar, Malawi, Nicaragua, and Paraguay—stopped regular reporting; in some cases, because the local project office closed or because data were no longer available. Currently, 32 countries regularly report to the PPMR. Of the reporting countries, 12 are project-presence countries.



Of the 14 West and Central Africa target countries, 12 are participating in the Early Warning System: Burkina Faso, Cameroon, Cape Verde, Chad, Côte d'Ivoire, The Gambia, Guinea-Bissau, Mauretania, Niger, São Tomé and Príncipe, Sierra Leone, and Togo.

In July 2012, building on the success of the existing platform, the project transitioned the PPMR to a new web-based database; it offers multiple institutions better visibility into PPMR data and increases informed donor coordination. Using the contraceptive Early Warning System (EWS), the PPMR also expanded its coverage to include additional countries in West and Central Africa as a step toward regional, multi-institutional coordination and cooperation.

Using PPMR data, the project produced an interactive web map of consumption data for all the commodities reported, demonstrating how data can be geographically and visually represented to aid decisionmaking. Interactive features will enable users to view additional information for a country, such as products used and average monthly consumption, per program. For example, these features allow comparisons of use across countries and contextualization of stock levels to inform decisions about potential stock transfers. Further developments are underway in this area, including launching the web maps on the project website.

During the last year, PPMR monitoring by the CARhs group resulted in a number of movements of supplies from one country to another. Most notably, the project

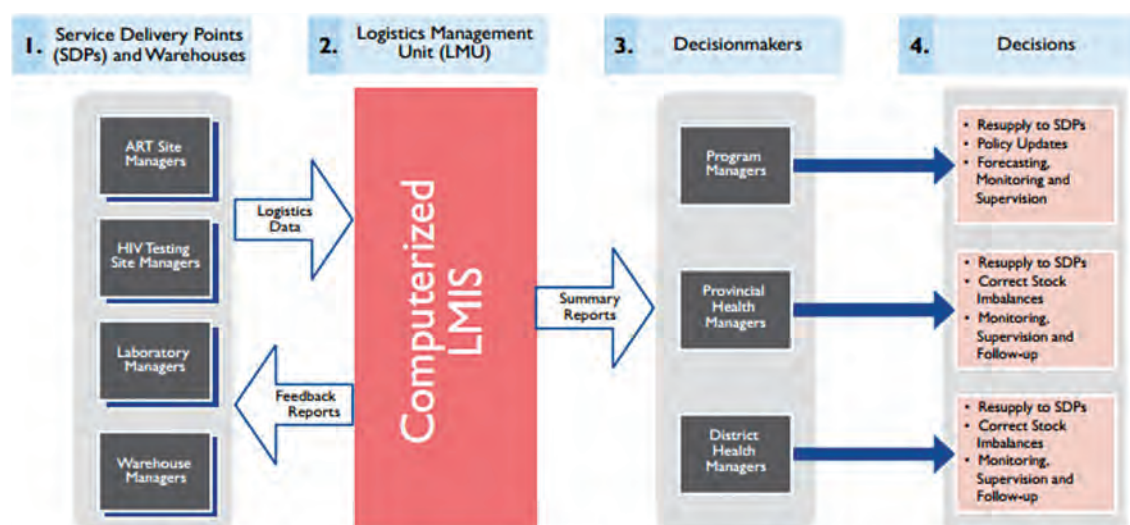
helped facilitate a successful swap of overstocked commodities between Ghana and Liberia, and negotiated a commodities transfer from Ghana to Togo.

Automating the LMIS

As developing country public health supply chains become increasingly complex, and decisionmakers require more visibility into supply chains; paper-based systems for collecting, aggregating, and analyzing data become increasingly burdensome. Automation of supply chain functions naturally follow, but that presents challenges because of the gaps in the technology infrastructure in many developing countries.

LMISs provide the information needed for supply chain operators to make informed decisions for forecasting, procurement, and supplies management throughout the supply chain, thus helping to ensure product availability. Currently, most LMISs are computerized only at the central level (see figure 1). The project is working to expand computerization of LMISs, as appropriate, with built-in flexibility to accommodate the many workers or facilities that lack dependable access to computers or the Internet.

Figure 1. Sample Information Flow



Information flows through Steps 1 – 4 at which point decisionmaking impacts future logistics data and the cycle begins again.

Decisionmaking Using Logistics Data

- Forecasting commodity needs
- Procurement planning
- Resupplying facilities
- Inventory management
- Advocacy & resource mobilization
- Facilitating donor coordination
- Identifying areas for supply chain improvement

In Tanzania and Zambia, the project is developing an eLMIS that can be configured to each country's needs, including integration with existing systems in use in each country; providing a comprehensive enterprise-level LMIS. The scope of such a system is a potential game changer for LMISs in developing countries. Understanding that local ownership will be critical to the success of the eLMIS, the project has been working with national stakeholders to ensure that they are an integral part of the process and that they take a leadership role in the design, development, and implementation of the system.

In Nepal, improvements in the LMIS, and the addition of web-based reporting in 2008, led to profound changes in the way information is used and shared throughout Nepal's public-health supply chain. Supply chain operators and policymakers depend on reliable logistics data to inform decisions. Waste and expiry of commodities has been reduced by improving storage and inventory management, facilitated by easier access to accurate and timely data. Similarly in Pakistan, a web-based LMIS, originally developed by the project in Bangladesh, has been adapted and is currently being rolled out across all 143 districts in the country.

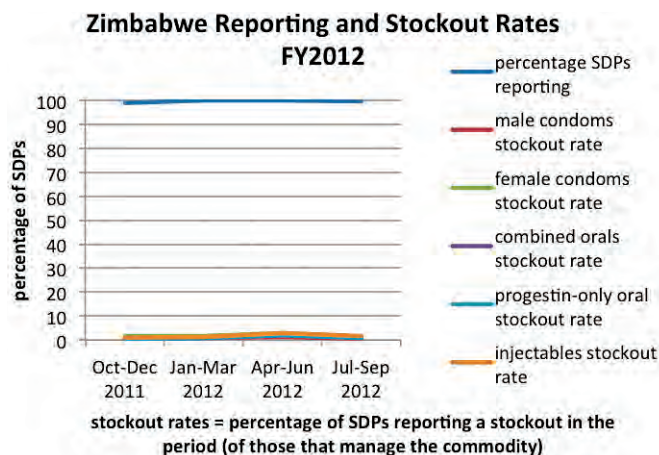
Capitalizing on the Expansion of Mobile Technology: mHealth

The evolution of mobile technology in many of the countries where the project works has given us a unique opportunity to improve reporting adherence and to increase supply chain decisionmakers' visibility into their systems, even while Internet access challenges persist.

Delivery Team Topping Up

The project's Delivery Team Topping Up (DTTU) system is an innovative approach to managing and resupplying of family planning and HIV commodities. Unlike typical logistics systems where paper reports, generated by facility staff, determine the order quantities; in Zimbabwe, every facility is visited quarterly by a supply truck and a delivery team leader (see figure 2). They enter critical logistics data into customized software on a mobile laptop, which then calculates resupply quantities. Based on these results, the

Figure 2. Delivery Team Topping Up Achieves Data Visibility and Supply Chain Performance



Stockout rates remained at 3 percent, or lower, across the nearly 1,600 service delivery points (SDPs), in the 10 provinces throughout Zimbabwe, ensuring commodities were available for clients.

Zimbabwe's Top Up software facilitated reporting of reliable data by more than 99 percent of the SDPs, offering visibility to inform stakeholder decisions.

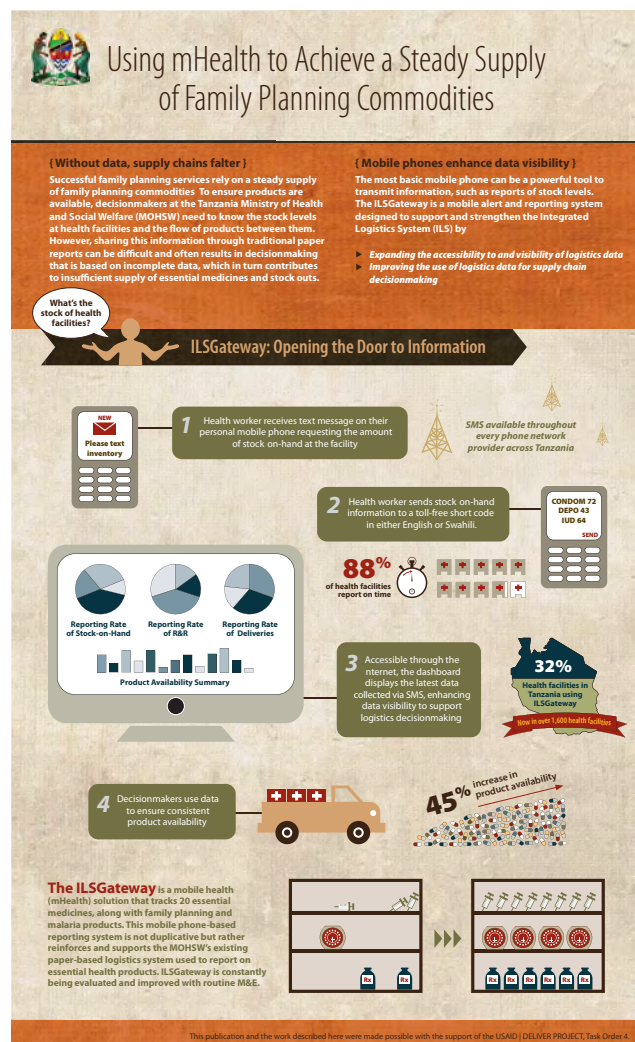
supply truck tops up the facility stocks to the appropriate level. After returning from a delivery, logistics data from the laptops are synchronized to the Top Up software at the central level.

The DTTU, which serves all public-sector health facilities in Zimbabwe, as well as community-based distributors, averages a 99 percent coverage rate at these SDPs during each delivery run. Stockouts have been significantly reduced: using the DTTU, contraceptives and condoms for HIV prevention have more than 98 percent availability. Building on the success of the DTTU system in Zimbabwe, the project is working with the Ebonyi State Ministry of Health (MOH) in Nigeria to pilot a similar system in approximately 200 facilities.

Integrated Logistics System Gateway: Expanding the Visibility and Accessibility of Logistics Data

To strengthen and support the functioning of the paper-based integrated logistics system (ILS) in Tanzania, the project developed a system using short message service (SMS)—also called text messages—to facilitate routine reporting of supply chain data. The mHealth

Figure 3. ILSGateway Infographic



- increased reporting rates and adherence to reporting groups
- improved timeliness of ordering and stock management
- increased use of data for supply chain management
- increased accountability, transparency, and responsibility.

The project, with the Focus Region Health Project and Ghana Health Service, is piloting a similar system in Ghana—the EWS.

End-Use Verification

To improve monitoring and supervision, the task order has supported the End-Use verification (EUV) activity in Ghana, Mozambique, Malawi, Tanzania, and Zambia. The EUV, a quarterly survey, is conducted at a selection of health facilities and warehouses to assess the supply chain for a variety of family planning and malaria commodities, as well as other essential medicines. Data are collected by enumerators from the project, the MOH, and other stakeholders, using mobile phones enabled with the EpiSurveyor software. This approach has dramatically decreased the time between data collection and analysis. The findings are expected to be programmatically useful in the short term for decisionmaking, as well as providing a window into the long-term challenges for, and improvements to, the supply chain for these commodities. In each of these countries, the output of the activity is shared with the MOH; various programs regularly use the information in newsletters, meetings, and for planning. Although the EUV is only used in a sample of health facilities over the course of the year, it allows for some visibility into downstream supply availability in countries without a fully functioning national-level LMIS.

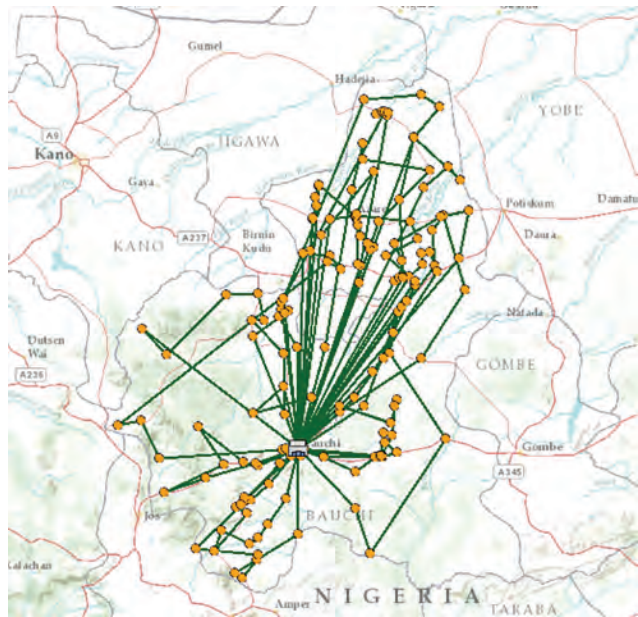
system—known as the ILSGateway—provides key decisionmakers access to detailed logistics information on the reporting rates, inventory, supervision, and delivery timeliness of essential health commodities (see figure 3). In addition to being relatively inexpensive to operate because it is an open source system, it is built on a platform that the MOH will never need to lease or purchase. Now, in more than 1,000 facilities, health facility staff members use their personal mobile phones to receive and send messages with important supply chain information for 20 essential medicines. This data is then made immediately available through a secure, user-friendly website. A November 2011 evaluation carried out by the project found—

- expanded accessibility and visibility of logistics data

GIS: Visualizing Geographic Data for Decisionmaking

GIS, a tool that enables users to visualize and understand large amounts of information, helps to inform decisionmaking. The project has evolved its GIS work, moving from an exploratory phase of identifying opportunities to use GIS, to implementation and wider-scale integration into programs where a GIS can provide added value. For example, GIS data can be integrated with other data sources and used to model distribution networks for a more targeted use of resources. The project is building local

Figure 4. Routing Solution for Delivery of Commodities in Bauchi State, Nigeria



capacity to use GIS to promote sustainability; approaches are tailored to resource-constrained, lower bandwidth environments. To ensure low cost and easy hand-off to local governments, the project is employing open-source GIS tools; they will be used for web mapping of logistics data.

The project's GIS work is contributing to overall higher data accuracy standards. In Nigeria, the project used GIS for transport distribution modeling that can help in selecting a distribution vendor for a DTTU-type pilot (see figure 4). As a critical step to expand our work in this area, the project has produced a guide to help logistics managers, decisionmakers, and technical experts understand the value of integrating GIS and to assist in a step-by-step process of how to do so. An approach to increasing visibility of health commodity logistics data—exploring the potential for linking LMIS data to GIS data for monitoring, evaluating, and analyzing logistics data—is being tested in Rwanda and Zambia.



(Photo Credit: David Lubinski, PATH)

Chipopa Kazuma from Medical Stores Limited explains the improved business process for forecasting activities in Zambia.

Adapting Private-Sector Tools for the Developing Country Public Health Context

It is becoming clear that tools and practices used to manage and support well-functioning supply chains in the private sector can be adapted to improve management of commodities and logistics information in the public sector. The project has applied private-sector practices—network optimization, decentralized distribution models, vendor managed inventory (VMI) models, benchmarking, performance-based incentives, and costing analysis—to minimize the cost of getting products to people and to maximize resources for purchasing the commodities.

Network Optimization

Using a pyramid structure of regional and district depots, many existing country logistics systems were designed with a central holding and processing location—often a Central Medical Store (CMS)—to facilitate warehousing and distribution of commodities to facilities. Although this design responds to administrative reporting and control needs, the project is exploring models that would ensure more efficient product availability across a country, with fewer *product touches*.

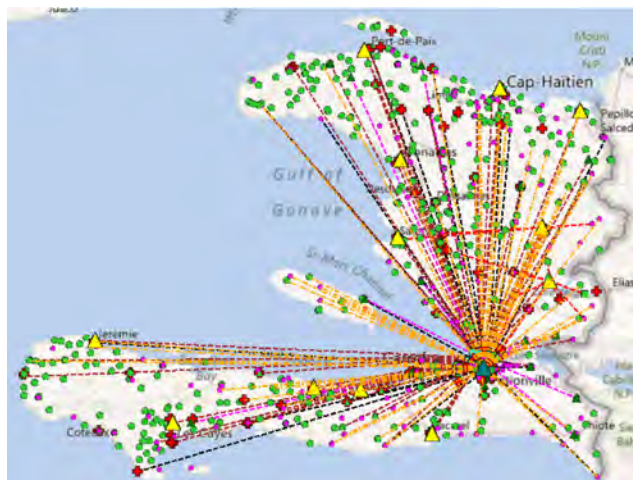
In South Sudan, the project is identifying alternatives that balance an optimized system with administrative structures. Two-thirds of the country might be better served by direct-to-district shipments, coming over land from ports in Kenya; while the remainder of the surface shipments, as well as some air shipments, would be more sensibly handled through the CMS in Juba.

To inform the rebuilding of Haiti’s public health logistics system, the project modeled and proposed options to optimize the distribution network. This included reducing the number of provincial warehouses and integrating—to the extent possible—the seven different vertical distribution systems. This would relieve the previous system’s over-reliance on Port-au-Prince and would open the door to alternatives, including multiple regional stores—of which Port au Prince is just one—that could be better situated to supply facilities throughout the country. In Haiti, the project modeled seven distinct supply chain delivery systems, including commodities for HIV and AIDS, family planning, essential medicines, and malaria (see figure 5).

Fostering the Development of Local Commercial Capacity

Donor investments in the parallel supply chain in Malawi are creating local commercial capacity among private-sector logistics providers. After being exposed to storage and distribution activities that meet a higher standard, other potential third party logistics providers (3PL) are upgrading their facilities to serve public- and private-sector needs in the future.

Figure 5. Distribution Network in Haiti



Third party logistics vendor delivers commodities to Mzimba district warehouse in Malawi.

Working with private-sector partners, the project presented donors with possible strategies for developing the parallel supply chain, further strengthening—not just supporting—local systems.

Detailed Business Analysis and Costing Informs MOH and Donor Plans.

Business analyses that take a detailed look at supply chain costs and revenues to maximize profits are common in the private sector. In the public sector, the objective is to ensure that resources are optimally deployed to maximize product availability.

In Rwanda, the project undertook an unprecedented, detailed costing of the entire public health supply chain to identify cost drivers; and, ultimately, to flag inconsistencies in costs for the Medical Procurement and Distribution Division’s procurement, warehousing, and distribution services. The analysis concluded that the MOH and donors need to ensure that supply chain costs at district pharmacies and SDPs are properly funded, because the markup on essential medicines was not high enough to cover out-of-pocket costs in six out of 10 pharmacies visited. The analysis also adds to the project’s knowledge about the actual cost of operating public-health supply chains; and, therefore, its advocacy with governments and donors to protect their investments in commodities by allocating resources for the supply chains that deliver them to people.



DDIC team executes its first delivery run in Ebonyi, Nigeria, January 2013

Benchmarking

Benchmarking is used in the private sector to ensure that supply chains are performing to industry standards. The project continues to develop ways to improve the standards of supply chain performance that are appropriate for the realities in the countries where we work. Through our collaboration with the Supply Chain Management System (SCMS) project, the project deployed the capability maturity model in Paraguay to assess areas where the MOH needs to focus after project closeout.

VMI. To help inform countries on an alternative approach to inventory management, the project researched different models of VMI; then drafted guidance on how to select

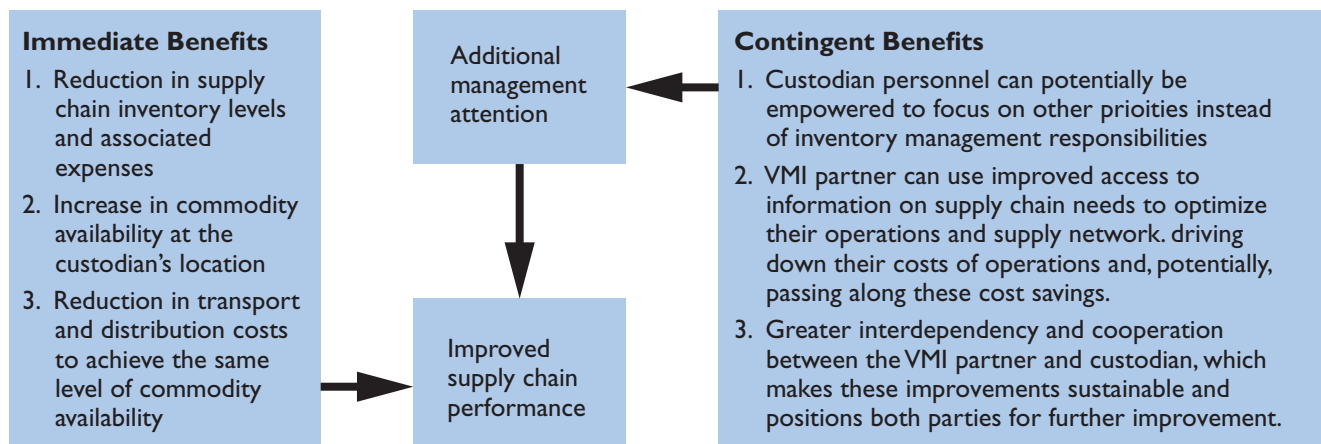
and apply appropriate models to public health-sector supply chains in developing countries. One model, the Direct Delivery and Information Capture (DDIC), is being piloted in Nigeria.

The project also published a technical brief and a detailed guide on VMI (USAID | DELIVER PROJECT 2012c), positing a working definition for the concept in the developing country public-health context and researching case studies to understand potential supply chain benefits and the implications of implementation (see figure 6). Through a presentation at the *Deutsche Gesellschaft für Internationale Zusammenarbeit* (2012) conference in Tanzania—Engaging with the Private Sector in Health in Africa—a popular discussion on the International Association of Public Health Logisticians (IAPHL) listserv, and discussions with partner organizations, this guide has helped position the project as an authority on commercial-sector approaches.

Looking to the Future

Even as the project supports countries in finding ways to strengthen their current systems, it is also helping countries plan and prepare for future eventualities by modeling the supply chains of the future. Given such parameters as financing trends, disease trends or infrastructure, modeling can help predict supply chains requirements and considerations for the coming years. For instance, in Tanzania, the project applied a modeling framework to understand and analyze the current and future state (2020–2024) of supply chain requirements for procuring and distributing essential

Figure 6. Expanded Benefits of VMI System

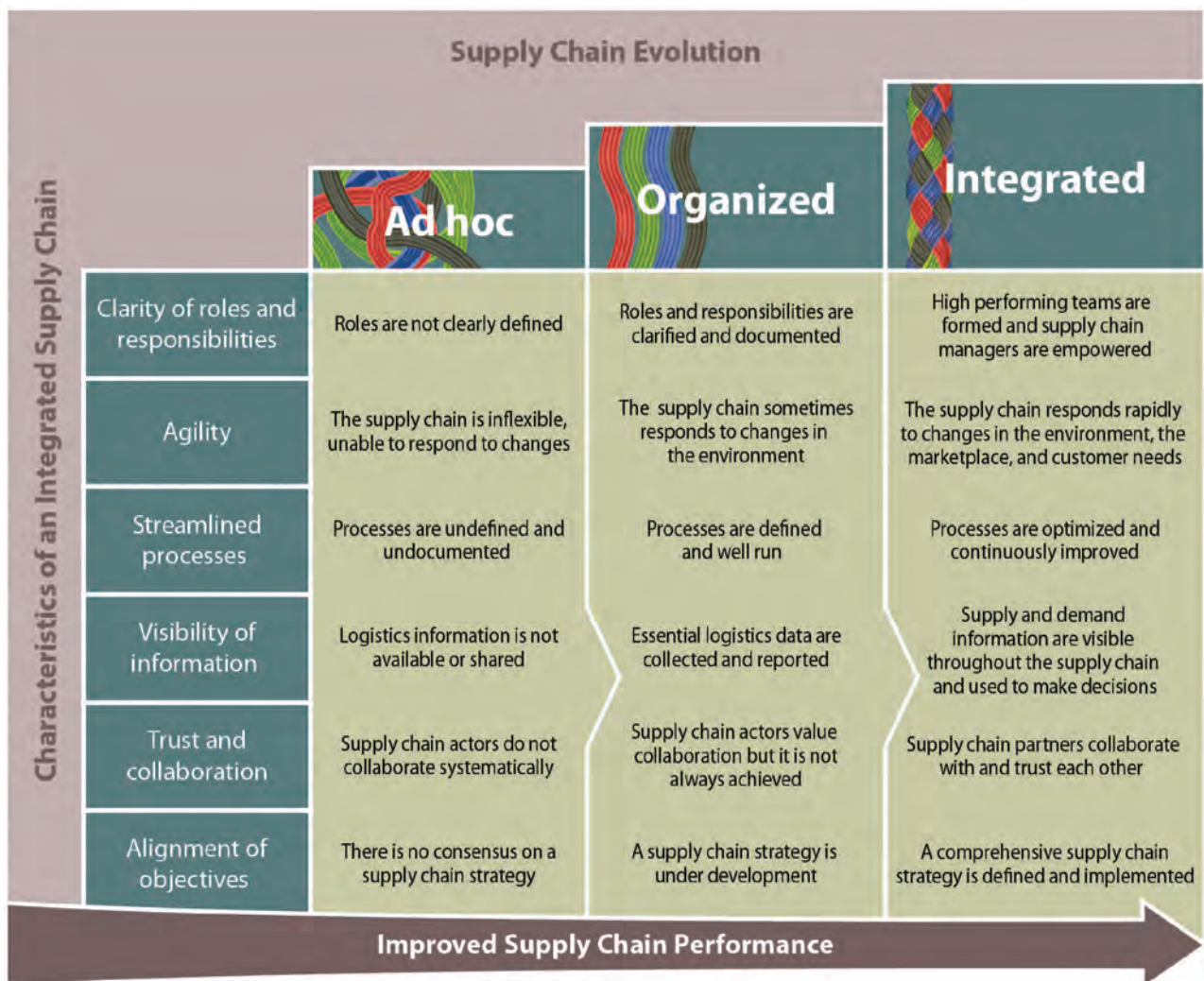


medical commodities. With Llamasoft, Inc., the project developed the framework that is used to forecast public-health supply chain needs and to enable policymakers to strengthen the logistics infrastructure when they plan future needs. Results from the analysis found that, using quantitative analysis, substantial improvements can be made in the Tanzania medical stores department—for example, increased service levels and decreased costs—that will help the country plan for future supply chain demands.

In addition, the project's supply chain evolution model provides intellectual leadership to help countries take a more strategic approach to their supply chains. The October 2011 brief, *Supply Chain Evolution: Introduction to a Framework for Supply Chain Strengthening of a Developing Country Public*

Health Programs (McCord and Olson 2011), explains how to implement and sustain an integrated supply chain. The framework describes how improved integration and data visibility, with stronger role definition and accountability, can improve performance (see figure 7). It illustrates how public health systems can move through a process management trajectory that leads to improved supply chain management capacity. To conceptualize the path that supply chains follow toward increased maturity, this model visually displays a supply chain strengthening framework, including the end goal of supply chain strengthening and the general steps needed to get there. The project is moving forward with operationalizing the model; we are developing an online tool to help countries better understand, describe, plan, and monitor their supply chain strengthening activities, over time.

Figure 7. Supply Chain Evolution



Source: John Snow, Inc.

The JSI Supply Chain Integration Framework builds on concepts from the project's Supply Chain Evolution Model (John Snow, Inc. 2012).



Figure 8. Where We Work

In FY2012, the project supported country office programs in 18 countries; these include the two offices in Honduras and Paraguay that closed during the year. Thirty-two countries, including all project-presence countries, except Nepal, received STTA.





Pakistan:

Partnering to Ensure Commodity Availability

For the first time in several years, Pakistan has achieved a full supply of major contraceptives in all 143 districts. To ensure the availability of contraceptives throughout the country, the project partnered with the United Parcel Service (UPS) to distribute USAID-funded commodities. LMIS data show that distribution has prevented frequent stockouts in the largest health services network in Pakistan.



Nepal:

Increasing Country Ownership

The Government of Nepal increased its ownership of the supply chain by financially supporting the web-based LMIS, originally designed by the project. Recognizing the need to continue the web-based LMIS, which helps ensure stock availability and is used for monitoring and planning, the MOH has committed to allocating their funds; they have also engaged a private-sector vendor for the final phase of development.



Ethiopia:

Expansion of the Automated Logistics Management Information System and Warehouse Management

At the government's request, the project extended the automated LMIS and warehouse management tool—the Health Commodity Management Information System—to all 16 Pharmaceutical Fund and Supply Agency (PFSA) warehouses at the central level; completed roll-outs to all 10 PFSA's supplying hubs for proper management of program and revolving drug fund commodities; and provided hospitals and larger health facilities with new implementation and ongoing support for the system. The health commodity management information system (HCMIS) is used in more than 90 percent of MOH hospitals and approximately 300 health centers.



Rwanda:

Using Pre-Service Training to Build Capacity at Nursing Schools

To strengthen the supply chain capacity of the health workforce, the project introduced health logistics management system course work for the pharmacy school at the National University of Rwanda. The course was so well received by the nursing schools' faculty and MOH nursing staff that the attending lecturers created their own curriculum and content for their students.



Building Sustainable National Capacity and Supporting National Ownership

Highlights:

- Of the field office staff, 95 percent are local or regional hires
- Of the Ministry of Health offices in project-presence countries, 81 percent have dedicated logistics positions or units
- Four regional institutes offer the supply chain modules in three languages
- The International Association of Public Health Logisticians membership increased 57 percent this past year
- Eleven sub-contracts were issued to local or regional organizations in project-presence countries, for a total of \$2.8 million
- Nine countries have adopted pre-service training in supply chain management

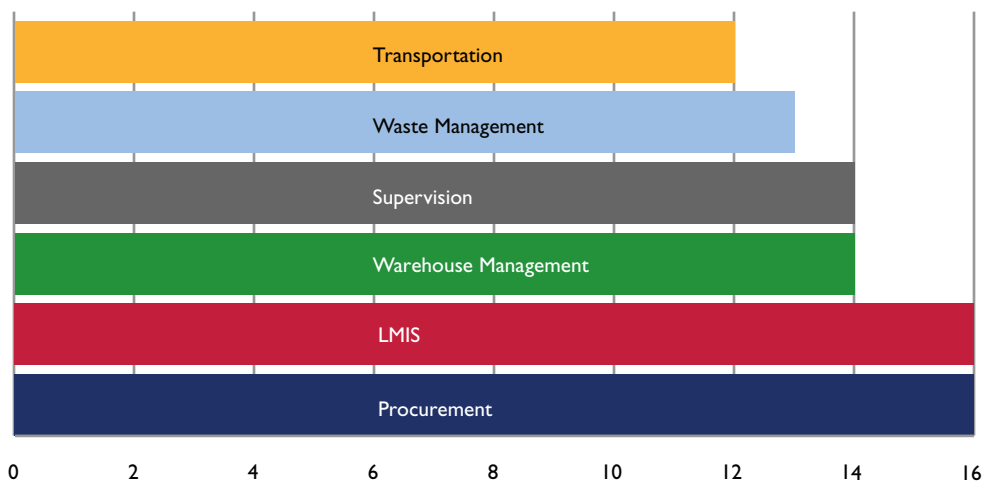
In many countries, donors and multilateral organizations have increased their support for commodities and, for the most part, supply chains. To capitalize on these commitments, corresponding investments in systems and other areas relevant to commodity availability—including human resource capacity, technology, and infrastructure—must follow. Building local capacity to ensure sustainability is a significant part of the approach taken by Task Order 4 to strengthen the supply chain. The project partners work with, and provide TA to, local and regional organizations, as they put these basic systems in place to strengthen the sustainability of in-country supply chains and the local capacity to manage them.

This includes ensuring that each step in the supply chain process is functioning and is being properly supported by underlying structures, protocols, procedures, guidelines, and/or systems; and that have been documented and approved for six core supply chain functions—procurement, LMIS, warehouse management, supervision, waste management/disposal, and transportation (see figure 9).

Overall, out of 16 project-presence countries being tracked by the project, eight countries reported having all six supply chain systems in place for sustainability: Bolivia, Malawi, Mozambique, Nepal, Nicaragua, Pakistan, Zambia, and Zimbabwe.

An additional five countries reported having five out of six supply chain systems in place for sustainability: Ethiopia, Ghana, Guinea, Rwanda, and Tanzania. Liberia and Nigeria have four out of the six systems in place for sustainability; while Guatemala, a new project-presence country this year, reported having only two out of the six systems in place.

Figure 9. Number and Percentage of Project-Presence Countries with Protocols for Core Supply Chain Functions



	Procurement	LMIS	Warehouse Management	Supervision	Waste Management	Transportation
Percentage	100%	100%	88%	88%	81%	75%
Number of Countries	16	16	14	14	13	12

The project is working to ensure that these basic systems for supply chain management are in place in all countries that receive significant technical assistance, because they are all critical building blocks for sustainable supply chain systems.

Furthermore, 13 out of 16 project-presence countries in FY2012 (81 percent) reported that the MOH has established positions or units that include defined responsibilities and required qualifications for supply chain management. Ninety-four percent of countries have an established procurement unit, or other body, that is responsible for procuring health commodities for the public sector.

In Zambia, the Logistics Management Unit (LMU) is based at the Medical Stores Limited (MSL); it plays a pivotal role in the success of the logistics system. Prior to the LMU's creation, facility stockout rates for five indicator antiretrovirals (ARVs) was 50 percent; by the end of 2008, the rate had dropped to less than 5 percent. Additionally, the reporting rate in the antiretroviral therapy (ART) logistics system increased to 100 percent because of the actions taken by the LMU staff. Every day, the LMU staff review the list of facilities that are due to report. They immediately call non-reporting facilities and send official

memos to the MOH district and provincial health offices. They also generate feedback reports for each facility, which they send with the facility's orders.

Increasing the Health Work Force Competence in Supply Chain Management

To develop supply chain management capacity, a number of countries are adopting pre-service training. In Rwanda, at the National University of Rwanda, a fifth group of pharmacy students benefited this year from a logistics course—now in its third year—as part of pre-service training. As a result, new pharmacists are bringing their knowledge and skills in health logistics and stock management to both the public and private sectors, easing a shortage of qualified personnel. The project also plans to introduce logistics training into the nursing curriculum in Rwanda. Similar activities to include supply chain management in standard public health and pharmacy education are also taking place in Ethiopia, Malawi, Nepal, Nicaragua, Pakistan, Tanzania, Zambia, and Zimbabwe.



In 2011, after the first year of pre-service training, pharmacy students at the National University of Rwanda graduated with specialized training in supply chain management.

Improving the Accessibility of Logistics Training Around the World

Since 2007, the project has strengthened the capacity of regional institutions to provide training in supply chain management. Now, four regional institutions—Bioforce in Burkina Faso, Eastern and Southern Management Institute (ESAMI) in Tanzania, RTT in South Africa, and PRISMA in Peru—offer quality, competency-based logistics training, in three languages, on two continents. The four self-sustained regional training institutions offer opportunities to reach more participants and build local capacity. In FY2012 alone, these four institutes conducted 10 workshops.

The project's distance learning modules, available online or an interactive CD, respond to the demand for logistics

training for people who either lack funding or time to attend an intensive week-long (or longer) course. Distance learning can be done at the learner's own pace through the JSI e-learning site; and, since May of this year, the online *Lessons in Logistics Management* (John Snow, Inc. 2013) are also available on another learning portal, the Learning Management System operated by LINGOs (ngolearning.org). In FY2012, 924 individual modules were completed using the two online portals.

The project also conducts regional and national training in supply chain management on request; this year included co-facilitation with RTT of the overview and quantification modules in South Africa, as well as a course for Zimbabwe. A number of countries with a larger project presence—Nigeria, Zambia, and Zimbabwe—are now undertaking capacity building locally, with less assistance from the home office than before.

New Tools to Assess the Capacity of Human Resources to Manage Country Supply Chains

The project's more than 25 years of experience strengthening local logistics capacity has brought into focus the human resources challenges common to the areas where our colleagues work. To inform tailored capacity development strategies at the country level, the project developed an assessment tool that looks at human resources for supply chain management: *Human Resource Capacity Development in Public Health Supply Chain Management: Assessment Guide and Tool* (USAID | DELIVER PROJECT 2012b). A manual, and reference and training materials, guide assessment teams in recruiting, training, and deploying

Highlights:

In FY2012, the project trained 18,602 people from 16 countries.

In Nicaragua, 589 women and 295 men were trained at the regional level since October 1, 2010. At this time, all trainees are performing the supply chain management function they were trained for.



data collectors; analyzing data; and developing strategic and operational recommendations. To identify strengths and opportunities for improvement, the tool divides into sections the components of supply chain management related to human resources.

This year, with the assistance and support of their respective ministries of health, the tool and guide were successfully implemented in Zimbabwe and Rwanda. In both countries, the assessment informed a broader capacity development strategy and recommendations designed to strengthen supply chain operations. In Rwanda, the results from the study and the competency framework, in particular, have guided the hiring of staff for the newly constituted LMU. The project and its partners have tested the tool in Burkina Faso, Dominican Republic, Ethiopia, and Mozambique; and they have refined it further based on feedback from the People that Deliver (PtD) conference participants.

Project staff members participate actively in PtD; they have supported a number of activities to further its agenda. In particular, the project lead the Advocacy and Knowledge Management Working Group, which produced and disseminated key awareness-raising materials on the critical need for support for human resources in supply chain management.

IAPHL Develops As an Organization

From its origin as a community for alumni of logistics trainings, the IAPHL has developed significantly in areas that include membership, member participation, public profile, and a variety of content and offerings for members. Membership increased during the year to 1,418, members from 97 countries; from 904 members from 90 countries. Listserv participation was active. A large volume of postings and responses, which shared knowledge and expertise among supply chain professionals, speaks to its value to members. IAPHL's public profile was raised with the addition of social media outlets—Facebook, LinkedIn, and Twitter; and a dedicated website (www.iaphl.org), launched in the spring of 2012. Among other new offerings, IAPHL partnered with the Reproductive Health Supplies Coalition (RHSC) to incorporate access to Learning and Professional Training Opportunities (LAPTOP)—a comprehensive supply chain management training database—into the IAPHL website. See appendix 5 for IAPHL membership statistics.



Improving Commodity Security Through Data-Driven Policy, Advocacy, and Planning

Highlights:

- A costing analysis helps make the case for informed supply chain investments.
- A growing base of data supports evidence-based approaches to achieving contraceptive security and helps countries monitor progress.
- The project demonstrates leadership by collaborating and providing valued technical guidance.

CS exists when every person is able to choose, obtain, and use quality contraceptives. The project focuses on tools, resources, and methodologies to make the case for CS, including for investment in the supply chains that deliver essential health supplies to the people who need them. The data we collect and analyze inform not only our own activities; but, also local, regional, and global partners' work on the importance of strengthening systems to ensure product availability; and, ultimately, achieve positive health outcomes. We are pursuing approaches that include supply chain costing, the *Contraceptive Security Index* (USAID | DELIVER PROJECT 2012a), the *Contraceptive Security Indicators* (USAID | DELIVER PROJECT 2010), tools for tracking finances at the country level, and performance-based financing (PBF).

Costing Analysis Helps Make the Case for Supply Chain Investments

The project is leveraging its experience and knowledge of supply chain cost analysis to equip stakeholders with costing approaches that enable them to mobilize sufficient resources to adequately fund their supply chains and better ensure product availability. In addition, costing work can be the basis for raising awareness about the importance of investing in supply chains at the global, regional, and national levels. This year, these strategies have produced a number of new or refined resources and tools for policy-makers, supply chain managers, and TA providers.

Detailed information about supply chain operating costs and cost drivers is essential to help supply chain managers, stakeholders, and development partners understand the scope of what is required to fund supply chain systems adequately and to make sound decisions to improve supply chain performance. However, in the planning process, the

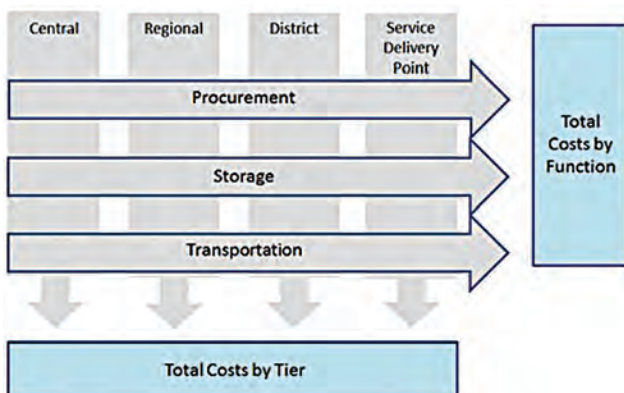
actual cost of getting commodities to health facilities is often unknown or overlooked.

The project understands the critical nature of the costing analysis as part of the planning process (see figure 10). We are leaders in filling this information gap by developing an approach to supply chain costing that offers countries a rigorous way to explore these costs. Building on experiences in Zambia and Zimbabwe, the project refined its costing approach in the *Guide to Public Health Supply Chain Costing: A Basic Methodology* (McCord, Tien, and Sarley 2013) and developing an Excel-based tool that was applied in Nigeria and Rwanda this year. In Nigeria, initial findings from the costing study indicated high fixed-costs and low-volume throughput at all levels, reflecting suboptimal system operations. The critical data from the findings helped each of Nigeria's 36 states decide how to organize and finance contraceptive distribution under the new system, in anticipation of the MOH's elimination of the long-standing cost recovery model.

Rwanda's public health supply chain has made substantive gains in product availability and information visibility over the past decade, but serving the needs of future populations will require a continuous review of operations and investments in the system. Information from the supply chain costing assessment was key to showing the critical financing and financial management issues; and it will inform these future strengthening efforts.

The most accurate and confident cost estimates come from an in-depth costing exercise using the supply chain costing methodology. Because it is not always feasible to

Figure 10. Costing Analysis Approach

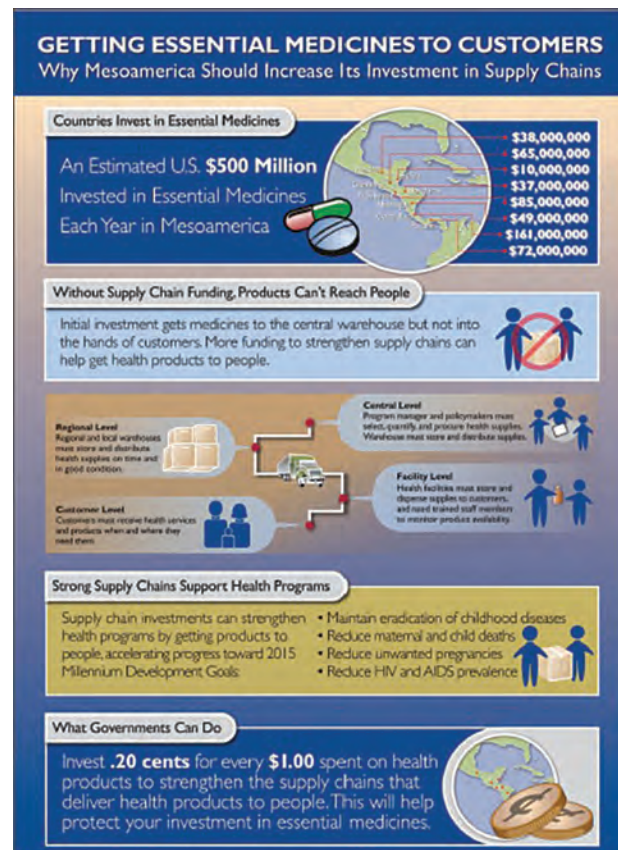


conduct costing exercises in every country, the project has also explored two other ways to estimate costs: benchmarks and modeling.

Based on supply chain costs, the project developed a set of metrics or benchmarks from project and partner costing activities. We will continue to add to this body of evidence; as more data are added, there will be greater confidence in these metrics as a way to help predict supply chain costs.

The project adapted the World Bank's *Logistics Performance Index* (World Bank 2012) and modeled it against a limited number of supply chain cost studies. The resulting supply chain cost ratio model shows strong predictive power for estimating supply chain costs as a percentage of commodity value. Countries can consider the estimates produced from the model as guidelines until they are ready to conduct more detailed cost analyses.

Figure 11. Getting Essential Medicines to Customers: Why Mesoamerica Should Increase Its Investment in Supply Chains





In Pakistan, Lady Health Supervisor Nasreen Munawar counsels Mrs. Azhar on using oral contraceptive pills.

Drawing on data from country studies, the project worked with regional partners in Latin America and West Africa to help explain why supporting supply chains will help protect investments in the country's public health commodities, strengthen health programs, improve service to customers, and help clients meet their health goals.

For instance—

- In Latin America, a partnership with the Mesoamerican Health Initiative 2015 of the Inter-American Development Bank used the model to estimate the total costs for supply chains to deliver essential medicines in the region and to develop an infographic that visually makes the case for this investment (see figure 11).

In West and Central Africa, as a foundation for further advocacy on the importance of investing in supply chains, the project carried out a set of contraceptive needs projections for 14 countries and applied the model to produce supply chain cost estimates for the region.

Exploring Return on Investment

Decisionmakers in developing countries must continually choose between different courses of action in pursuing public health goals, including how best to strengthen the supply chain and improve its performance. The money invested in the supply chain can have an immediate and/or longer-term impact; with the end goal of more accessible, higher quality, affordable products and services and, ultimately, better health.

Highlight:

Access to Commodities and Better Health: Evidence from Pakistan and Rwanda

- An efficient family planning supply chain that ensures consistent product availability has a critical role in preventing unintended pregnancies, as well as maternal and child morbidity and mortality.
- Using logistics data on the quantities of contraceptives distributed, the project estimated the impact of contraceptive commodity availability on key maternal and child health outcomes.
- For Pakistan, the findings indicate that the quantities of contraceptives distributed to clients through the supply chain from 2010–2011 represent approximately 11 million couples served; which translates to 3.2 million unintended pregnancies prevented; more than 81,000 infant deaths; and 3,300 maternal deaths potentially averted.
- For Rwanda, contraceptives distributed to clients through the public-sector supply chain from 2005 to 2011 represent approximately 2.85 million couples served, which translates to preventing an estimated 820,000 unintended pregnancies, approximately 22,600 infant deaths, and more than 2,400 maternal deaths.



Economic evaluation is one way to inform these choices. Yet, to date, the public health supply chain community has not had a common approach to understand the value added from supply chain investments. Recognizing this gap, the project is developing a common understanding of options and considerations for approaching the economic analysis of public health supply chains. This work will help develop a rigorous and tested way to understand and build a body of evidence around how to apply common approaches: cost-effectiveness analysis, cost-benefit analysis, and return on investment analysis for supply chains. The project has developed a guide to help decisionmakers understand the different forms of economic evaluation and when the evaluations are appropriate to use. It is also supporting field office efforts to apply some of the different forms to measure the cost benefit of specific activities and interventions.

Contraceptive Security Index: A Decade of Monitoring Progress and Measuring Success.

The Contraceptive Security Index (USAID | DELIVER PROJECT 2012a) uses a set of 17 indicators, covering five strategic areas, from more than 60 countries, to measure each country's level of CS. With new data collected in 2012, this represents a decade of scores since 2003, which corresponds to significant efforts by global donors to improve CS throughout the world. The index can be used to advocate for CS, set priorities, improve resource allocation, and monitor progress toward achieving a secure supply of quality contraceptives.

Key findings demonstrate that—

- Statistically significant improvements have been made in CS, overall, during the past decade, across many countries and components.
- The highest component scores are in the supply chain, but the most progress is in finance.
- Countries with the lowest scores in 2003 made the most progress during the decade, particularly in sub-Saharan Africa.

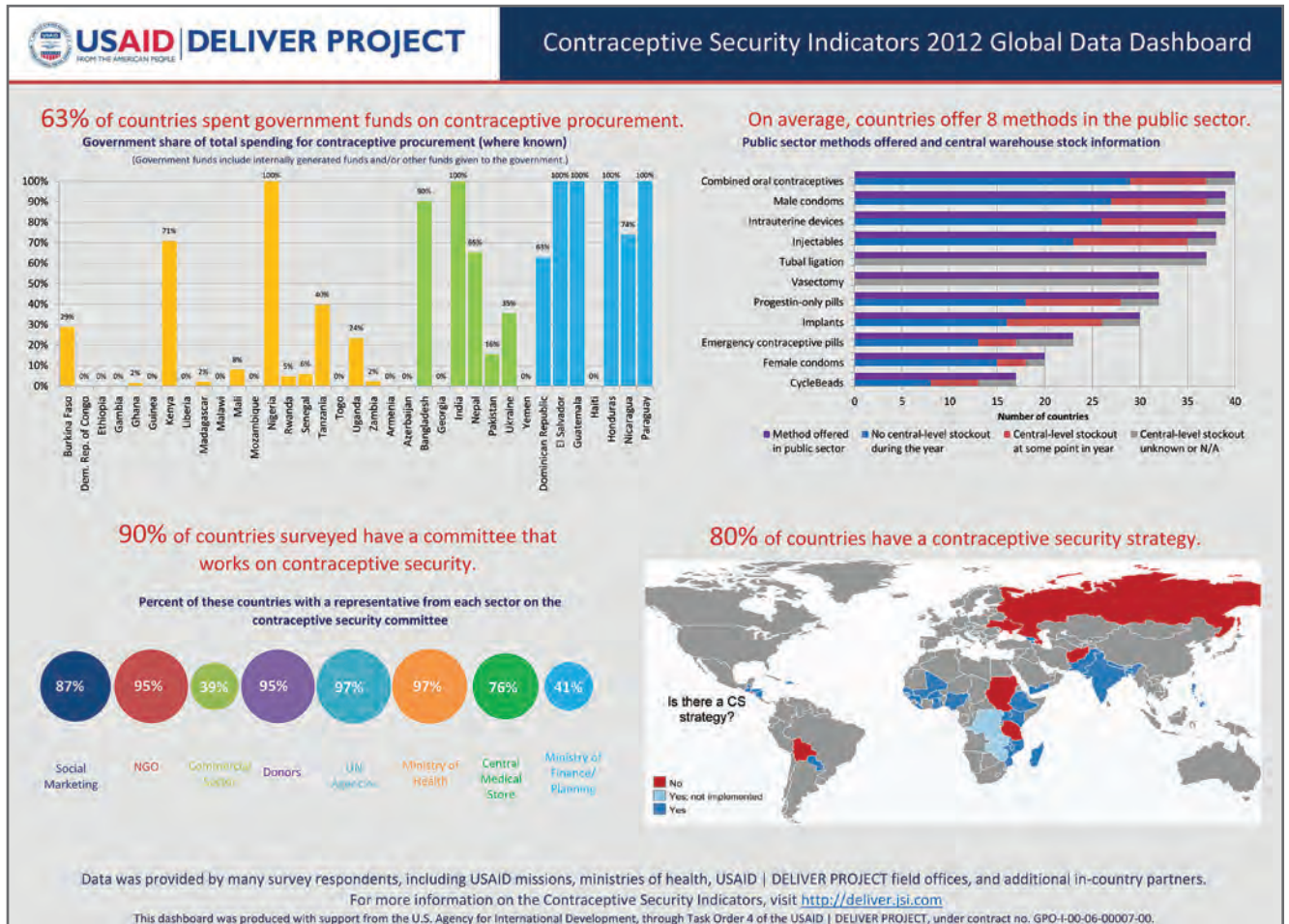
An Increasing Base of Contraceptive Security Indicator Data and a New Visual Dashboard Support Evidence-Based Approach.

Countries and other stakeholders value critical data that can be used to better understand and track the CS situation in a country, as well as across themes. This year, a fourth round of data collection for the *Contraceptive Security Indicators* (USAID | DELIVER PROJECT 2010)—a set of standard indicators to help countries collect data about finances, commodities, policies, coordination, and the supply chain—amassed information from 42 countries (see figure 12). New data dashboards and maps help translate and visualize the data for easier use by country and global stakeholders as they monitor progress, inform program planning, and undertake evidence-based advocacy. These efforts, which are resonating with stakeholders; do not only collect data, but also make the data easier to understand and use.

Data from the *Contraceptive Security Indicators* have been disseminated to and used by the Guttmacher Institute, RHSC Resource Mobilization and Awareness (RMA) working group, High Impact Practices for Family Planning briefs, International Planned Parenthood Federation, MEASURE Evaluation Project, Population Reference Bureau, and the International Consortium for Emergency Contraception, among others. Data also were used to inform key messages for congressional reporting by the Commodities Security and Logistics Division and for the annual report by USAID's Africa Bureau and the Family Planning Resource Tracking Working Group for the Family Planning Summit. These data are among the project's most downloaded resources.

The *Contraceptive Security Indicators* are filling an important data gap and helping stakeholders understand the family planning and CS situation in many countries. For example, to help recognize and respond to funding gaps, mobilize resources, and ensure accountability, country and global partners require data on financing for contraceptives. The *Contraceptive Security Indicators* provide critical data for these purposes.

Figure 12. Contraceptive Security Indicators 2012 Global Data Dashboard

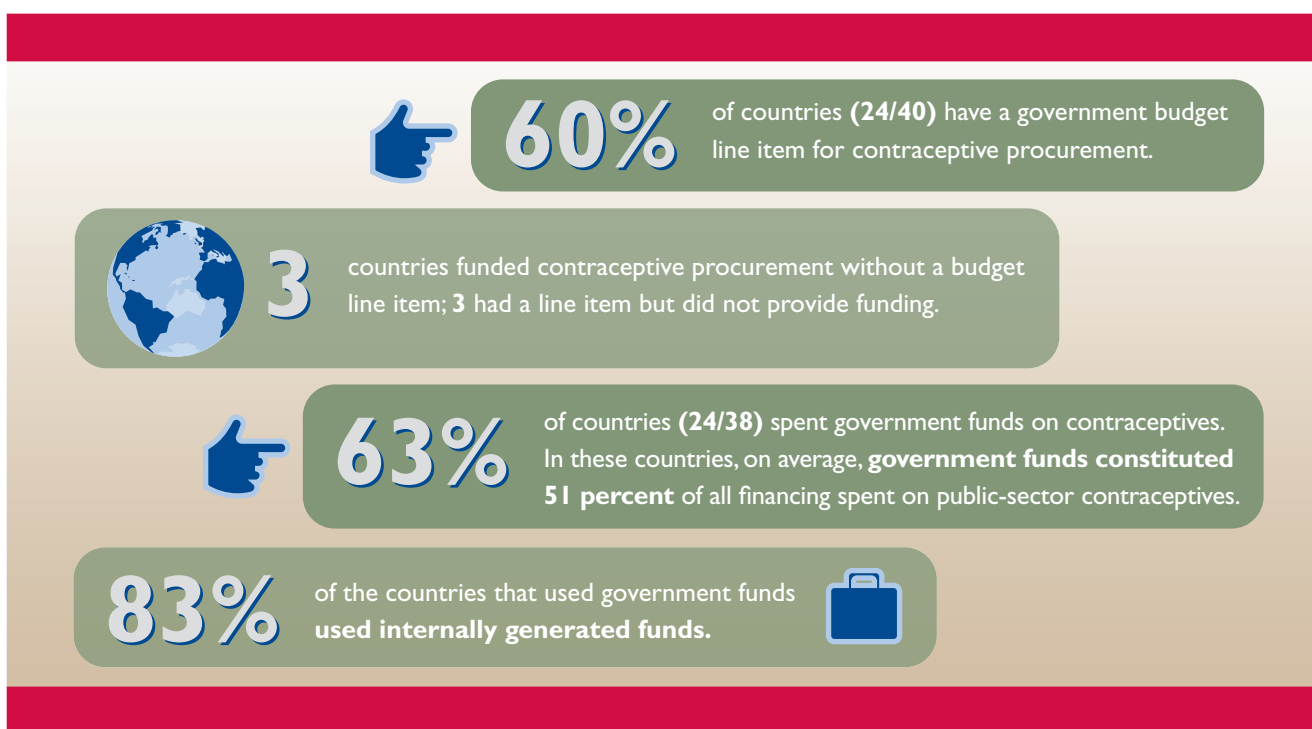


Following the Money: Tracking Financing Data and Mapping Funding Flows

According to the *Contraceptive Security Indicators*, in the most recent fiscal year, approximately \$190 million was spent for public-sector contraceptive financing, from both donor and public sources. As more countries and donors recognize the importance of tracking contraceptive financing, decisionmakers need better information to monitor trends, understand funding gaps, and mobilize resources for contraceptives and other commodities. At the same time, advocates need to better understand the flows and processes by which funds are turned into commodities, where the bottlenecks are, and where to target their efforts to ensure timely procurement and delivery of commodities.

Building on the financing component of the *Contraceptive Security Indicators*, the project is developing guidance to help countries track financing data and map funding flows. During the past year, in Ghana and, more recently, in Uganda (in partnership with Advance Family Planning [AFP]), the project provided technical assistance to country stakeholders in applying this methodology. As part of this process, the project continues to work closely with the RHSC RMA Working Group, Population Action International, and AFP, to ensure responsiveness to their constituent needs and to help these stakeholders fulfill their role of monitoring and advocating for contraceptive financing.

Figure 13. Contraceptive Security Indicators Provide Data on Contraceptive Funding.



Leadership in Expanding the Knowledge Base on PBF for Supply Chains

PBF, which offers opportunities to strengthen supply chains by linking performance to rewards, is widely used in the commercial sector; but, little evidence is available on its applicability to public health supply chains.

To remedy this, the project planned a long-term strategy to develop a body of evidence and to provide the public health supply chain community with information about the potential benefits and challenges to its application. To support this strategy, the project convened a meeting of experts to learn from commercial-sector applications, conducted a literature review of current examples, supported field-based interventions to learn from successes and risks on the ground, and collaborated with partners to develop a guide for PBF.

The recently published *Options Guide: Performance-Based Incentives to Strengthen Public Health Supply Chains—Version 1* (Eichler et al. 2012), developed in collaboration with Health Systems 20/20, Systems for Improved Access

to Pharmaceuticals and Services, and SCMS, will help stakeholders plan and implement performance-based incentive interventions for public-sector supply chain strengthening. It addresses key steps in the process—from identifying supply chain problems that could benefit from PBF interventions, to monitoring and evaluating these interventions.

To better understand the potential opportunities and challenges of using PBF for supply chains in developing countries, the project has ongoing efforts with stakeholders in Mozambique, Rwanda, and Ghana. In Mozambique, an assessment, in collaboration with HS2020, aimed to inform the incorporation of PBF into a proposed direct funding agreement between the U.S. Government and the CMS (*Central de Medicamentos e Artigos Médicos* [CMAM]). The project also helped stakeholders design and agree on relevant indicators. In Rwanda, an assessment of options for applying PBF to supply chain systems indicated that opportunities were available to modify existing PBF schemes at the health center and hospital level, and scope to develop a new PBF scheme for the district pharmacies and the CMSs.

Technical Leadership and Collaboration in CS

Partners value and continue to seek expertise from the project; staff members remain trusted resources and key informants on developing strategies and initiatives in the field. For instance, project staff served in leadership and coordination roles for the Systems Strengthening Working Group of the RHSC; we also participated in and provided evidence for advocacy messaging for the RMA Working Group. Project staff provided technical guidance and extensive inputs into the coalition document—*Family Planning Access for All: Policy Change for Action and Accountability* (RHSC 2012)—a policy primer prepared before the London Family Planning Summit. The project was also a key informant for numerous reviews and assessments by partner organizations: Clinton Health Access Initiative, McKinsey & Company, Bill & Melinda Gates Foundation, and United Nations Population Fund (UNFPA)/AccessRH. The project was a technical reviewer for the *High Impact Practices in Family Planning* briefs (K4Health 2013); and provided data for specific topics, including financing and policy. Project staff were also the key authors on the *Supply Chain Management HIP* (HIP 2012) brief.

Similarly, the project provided technical guidance and support to a meeting of the Sustainability Technical Advisory Group—a group of international supply chain and development experts convened by USAID to offer advice on how to promote sustainability in supply chains that serve public health programs in low- and middle-income countries. The group's high-level strategic guidance for in-country supply chain managers and policymakers defines the characteristics of a sustainable supply chain; a determination of the requirements to build a sustainable supply chain; and proposed strategies to build a sustainable supply chain.

In addition, project staff were active attendees and presented on several topics at the International Family Planning Conference in Dakar, Senegal. This included costing results of vendor managed inventory, contraceptive indicators 2011, improving contraceptive procurement by building a south-south exchange network in the Latin America and Caribbean region, how the PPMR and country LMISs contribute to data visibility, the use of mHealth to improve contraceptive availability, and a

skills-building session for the World Health Organization Implementing Best Practices initiative.

Knowledge Management and Dissemination

USAID | DELIVER PROJECT Website

The project continued to be a knowledge leader and a centralized resource for lessons learned, tools, and approaches to supply chain management (SCM); with the project website as the centerpiece for dissemination to project staff, partners, potential vendors, and other interested parties. During the year, it was enhanced with a new homepage that features project achievements and a restructured site architecture, plus updated content for easier navigation and access to information about the project's work.

To measure website traffic, the project transitioned from Webtrends to Google Analytics—which is a more accurate and comprehensive tool. Based on information from both tracking services, the project website had 311,810 total page views during the last year, with an average of 5,438 unique visitors each month. Approximately 40 percent of the visitors were directed to the project website through cross-linking and sharing of project materials on partner, funder, and other organizations' websites. Several of the top websites that link to the USAID | DELIVER PROJECT website include JSI.com, forums.info.usaid.gov, cpc.unc.edu, globalhealthlearning.org, erc.msh.org, and who.int. The most visited project website pages were the homepage, My Commodities, Current RFPs, Resources, and Procurement News.

The site had 33,256 downloads, including software, such as PipeLine. The top ten downloaded project resources were—

1. *Logistics Handbook: A Practical Guide for the Supply Chain Management of Health Commodities*
2. PipeLine 5.1 software
3. *Supply Chain Evolution: Introduction to a Framework for Supply Chain Strengthening of a Developing Country Public Health Programs*
4. *Contraceptive Security Indicators 2011* (data spreadsheet)
5. *Logistics Indicators Assessment Tool (LIAT)*

6. *A Guide for Preparing, Mapping, and Linking Logistics Data to a Geographic Information System*
7. *Logistics System Assessment Tool (LSAT)*
8. *Concepts of Logistics System Design*
9. *Logistics Handbook: A Practical Guide for Supply Chain Managers in Family Planning and Health Programs - French*
10. *Supply Chain Manager User's Manual.*

Dissemination

Dissemination is critical to the project because supply chain management information—including reports, briefs, manuals, infographics, and guides—are valuable tools for global and field-based decisionmakers, supply chain managers, advocates, and other TA providers. Supply chain management tools and information are more widely accessible through the project's existing and new outlets: social media, blogs, and technical forums, including peer review journal submissions. For example, we submitted a paper on VMI to *Health Affairs*. At the same time, the project expanded its presence at global health conferences and hosted a Critical Issues Series panel event.

The Critical Issues Series event, *The Future of Pharmaceutical Supply Chain Management: Intelligent, Integrated, and Informed Design*, included innovative approaches in advancing supply chain systems to meet future health needs. The meeting focused on new technologies and innovative practices, which were adapted from the commercial sector to help build better performing, more cost-effective, and more agile public-health supply chains in challenging and changing environments. The project identified and brought together presenters from the commercial sector, implementing organizations, and ministries of health; each group provided valuable field perspectives on countries where these new technologies and approaches have been implemented.

The project's toolkit, *Tips & Tools for Strengthening the Effectiveness and Sustainability of Contraceptive Security Committees* (K4Health 2013) was launched on k4health.org. The toolkit includes existing materials—exercises, templates, and guidelines—that policymakers, program managers, and other multisectoral stakeholders can use to build and strengthen their CS committees.

A new dissemination strategy added new outlets and enhanced the project's ability to monitor the results of the dissemination efforts. The project launched a Facebook page for the project, and a Twitter account, Google Plus page, and Tumblr photo blog. We continue to take advantage of John Snow, Inc., and USAID social media channels to disseminate resources and increase interest in the project's work. Additional dissemination channels include LinkedIn, the PSM Toolbox, the USAID IMPACT blog, USAID's GH 360 internal blog, and JSI.com. The project also disseminates information through an array of listservs: IAPHL, Afro-nets, HIPNet, and E-Drug, among others. The knowledge management team also started using tagged links in conjunction with Google Analytics tools to improve how we evaluate dissemination efforts; an internal system was set up to track dissemination and the results.

For print publications, the project fulfilled more than 2,500 orders, including tools and software, which were distributed to individuals and organizations in more than 30 countries. The five most requested print publications were—

The Logistics Handbook: A Practical Guide for the Supply Chain Management of Health Commodities

Guidelines for the Storage of Essential Medicines and Other Health Commodities

USAID | DELIVER PROJECT Publications CD Toolkit

Lessons in Logistics Management for Health Commodities CD

Guidelines for the Proper Storage of Health Commodities (wall chart).

Publications Production

Production of publications and other materials—writing, editing, layout, and creating graphics—remains a central part of the project's work, and a prerequisite for any dissemination. In addition to required monthly reports, the knowledge management team supported staff in the home office and in the field with publications of technical reports, briefs, guides, handbooks, posters, abstracts, infographics, videos, website content, and more; the

team supported more than 70 knowledge management products during the year. A key publication this year was *Quantification of Health Commodities: Contraceptive Companion Guide*. In November 2011, as a companion to this main guide, the project published guidance specific to contraceptives in *Quantification of Health Commodities: A Guide to Forecasting and Supply Planning for Procurement*. The companion guide assists program managers, service providers, and technical experts during a quantification of commodity needs and costs for short-acting, long-acting, and permanent methods of contraception. These publications are also available on the project's website.

The project authored a policy brief, *Emergency Contraceptive Pills: Supply Chain Considerations* (USAID | DELIVER PROJECT 2012d), that examines key considerations for supply chain management of emergency contraceptives and recommendations to ensure the method is routinely available and accessible. The brief was disseminated to USAID Missions and more than 1,000 members of the International Consortium on Emergency Contraception.

Contraceptive Security and Decentralization (USAID | DELIVER PROJECT 2012e), is a series of briefs on effective strategies that reproductive health commodity security (RHCS) champions can use to support regional, district, and SDP personnel, and that will help ensure contraceptive availability in a decentralized setting. These strategies address issues that include financing, services, policies, and stewardship; they highlight successes in some countries, missteps in other countries, and creative solutions to challenges that emerged at both the higher and lower health system-levels.

Conclusion

In the past year, the project has helped USAID and its in-country partners make significant progress in achieving their desired healthcare outcomes. By enabling better supply chain performance, the project has facilitated access to and consumption of quality health services. To do this, the project has focused on—

- improving data visibility by using innovative tools for data collection, analysis, and use
- improving performance and agility by adopting commercial-sector approaches, outsourcing to private-sector partners, and determining ways to encourage good performance
- strengthening local ownership and capacity through pre-service training, empowering regional training institutes, building and supporting LMUs, and growing a community of practice through the IAPHL
- improving resource mobilization and resource allocation by clearly explaining logistics system costs, developing and using measures of progress toward commodity security, and articulating the costs and benefits of various supply chain interventions.

Going forward, the project will continue these efforts—in collaboration with global, regional, and national partners—to further improve access to high-priority public-health products. In addition, the project will look for opportunities to improve the accountability of host-country partners, to better explain the health benefits of supply chain investments, and to promote integrated and well segmented supply chains in the countries where we work.

The project faces a number of challenges in pursuing its mandate, the most significant are the following:

- *Limited individual and institutional capacity in the public and private sectors in the countries where the project works.* We continue to build capacity in our partner organizations; pursue innovative solutions to simplify operations; and with the private sector, whenever possible, help build their capacity and create linkages with public-sector partners.
- *Competing mandates for short-term performance improvements and for medium-term institutional strengthening.* While not mutually exclusive, they may require different strategies. We continue to emphasize performance improvement and, where needed, augment existing supply chains as a priority, while identifying and building longer-term institutional solutions.
- *Conflicting donor requirements that can create inefficiencies and duplication when host-country organizations respond to them.* We will continue to work closely with USAID at the national- and international-level to harmonize requirements for all donors.

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3.6 Total number of unique page views by content area 33

3.7 Number of downloads and order fulfillment for project materials 33

3.8 Number of active IAPHL members. 26

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Appendix I

Ensuring Commodity Availability

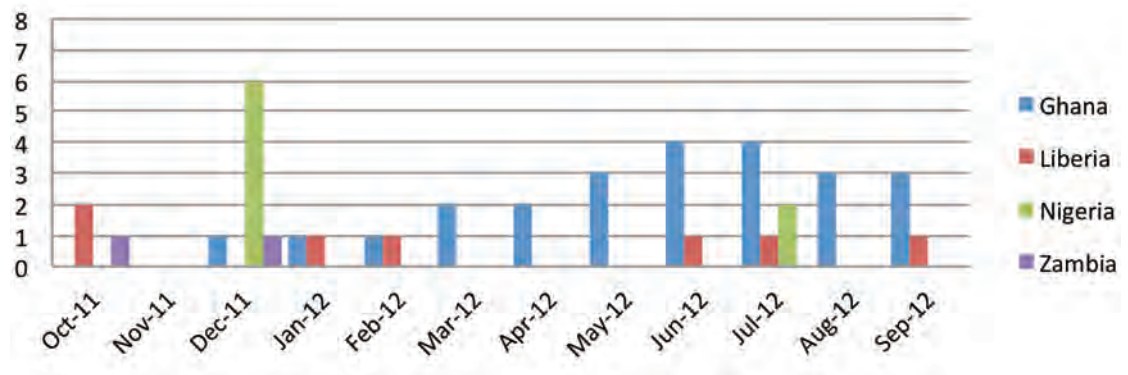
The strategic objective of TO4 is to improve commodity availability at service delivery points (SDPs) by strengthening in-country supply chain performance. The key metrics for measuring overall performance are stockout rates and reporting rates.

Since FY2007, the project has routinely monitored contraceptive availability at the central- and facility-level in most of the project-presence countries that received TO1 and TO4 funding. This is done through the Procurement Planning and Monitoring Report (PPMR) and quarterly reports submitted from the field offices.

During the FY2012 reporting period, no central-level stockouts were reported by eight of the project-presence countries that report to the PPMR: Guinea, Ethiopia, Mozambique, Nepal, Rwanda, Pakistan, Tanzania, and Zimbabwe. Four of the 12 project-presence countries reported at least one stockout at the central level. Figure 14 shows these stockouts, by month, in project-presence countries reporting stockouts only. Malawi does not report in the PPMR because it does not receive quality central warehouse data from the Central Medical Stores (CMS).

During FY2012, of these four countries, Ghana had significantly more stockouts than the remaining three countries. Ghana reported an extended central-level stockout of Norignyon, that lasted almost the entire year; as well as a six-month stockout of female condoms and a four-month stockout of both male condoms and Microlut.

Figure 14. Number of Central-Level Stockouts Reported to PPMR, by Month



Stockouts peaked in December 2011, with eight products stocked out in four countries, including six products stocked out in Nigeria alone (Depo-Provera, female condoms, IUDs, implants, male condoms, Microlut). Except for the ongoing stockouts in Ghana and the December stockouts in Nigeria, very few stockouts were reported throughout the year across the other three countries. For example, Zambia experienced only two stockouts, both for Noristerat. Liberia also had a repetitive (not consecutive) stockout of emergency contraceptive pills during the year.

As noted, using data from the in-country logistics management information system (LMIS), the project also continued to routinely monitor contraceptive availability at the facility level in eight project-presence countries. In addition, stockout data for Ethiopia are included in figures 15, 16, and 17, although these data are based on a sample of sites visited during supportive supervision. Contraceptive availability data are presented in figure 15 for male condoms, figure 16 for injectables, and figure 17 for combined oral contraceptives: the three high-demand resupply methods. The figures show that, generally, in reporting countries during this time, these methods are routinely available to clients at SDPs; stockout rates were at or below 10 percent in almost all countries reporting for these methods.

Notes: Ethiopia only began reporting in late FY2010; these data are based on a sample of sites visited during supportive supervision. Data from Nigeria represent availability in project-presence states only: Bauchi and Sokoto.

Almost all reporting countries have maintained very low stockout rates for male condoms, well below 10 percent this year—some for the fifth year in a row (those in *italics*): Ethiopia, *Nepal*, *Nicaragua*, *Paraguay*, *Rwanda*, and *Zimbabwe*. Honduras stopped reporting when the office closed in early 2012; however, rates continued to plummet from FY2011 on, until the office closed, finishing at just 10.9 percent for male condoms. In Malawi, rates are still high, although the average stockout rate for male condoms fell by almost one-third from FY2011 to FY2012; the country showed some improvement during the past year. Stockout rates for male condoms in Nigeria increased slightly, on average, during FY2011 and averaging 18.8 percent for FY2012.

For both injectables (see figure 16) and combined oral pills (see figure 16), almost all reporting countries have maintained impressively low stockout rates, well below 10 percent, some since reporting began in FY2007. For combined oral pills in Nigeria, stockout rates are very close to 10 percent, averaging 12.3 percent in FY2012, slightly down from an average of 13.2 percent in FY2011. As with male condoms in Honduras, although stockouts were initially high for both injectables and pills, rates dropped dramatically to approximately 10 percent or less for the last few reporting quarters before the office closed in early 2012. Finally, Malawi continued to struggle with high stockout rates for both injectables and pills, as well as condoms.

In addition to routine monitoring through the PPMR and countries' LMISs, the project has also collected a snapshot of commodity availability by regularly applying the End-Use Verification (EUV) data collection tool for malaria, as well as for contraceptive commodities in some countries. Although the EUV is used in only a sample of health facilities during the year, it provides limited visibility into downstream supply availability in countries without a functioning national-level LMIS. This integration of effort is occurring in a number of project-presence countries—Ghana, Malawi, Mozambique, Tanzania, and Zambia.

Figure 15. Stockouts of Male Condoms at Service Delivery Points, FY2011-2012

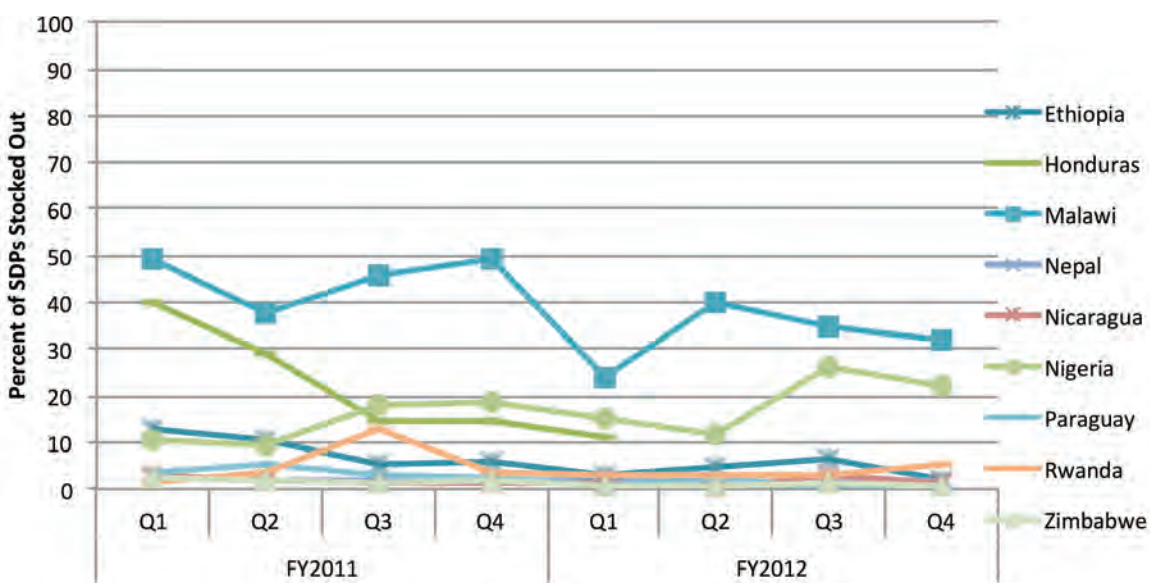


Figure 16. Stockouts of Injectables at Service Delivery Points, FY2011-2012

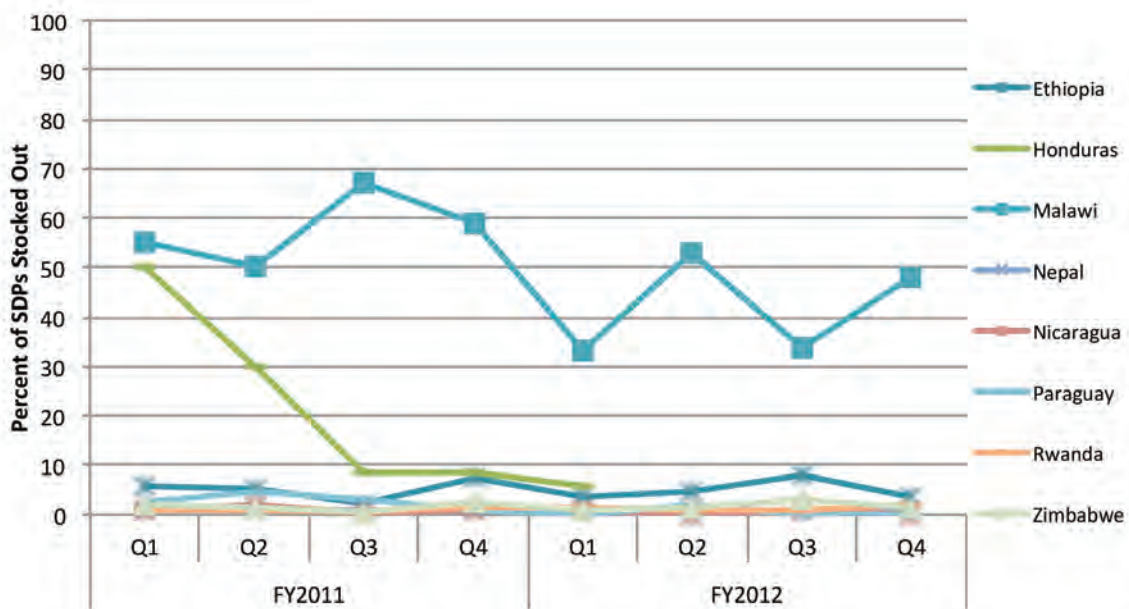
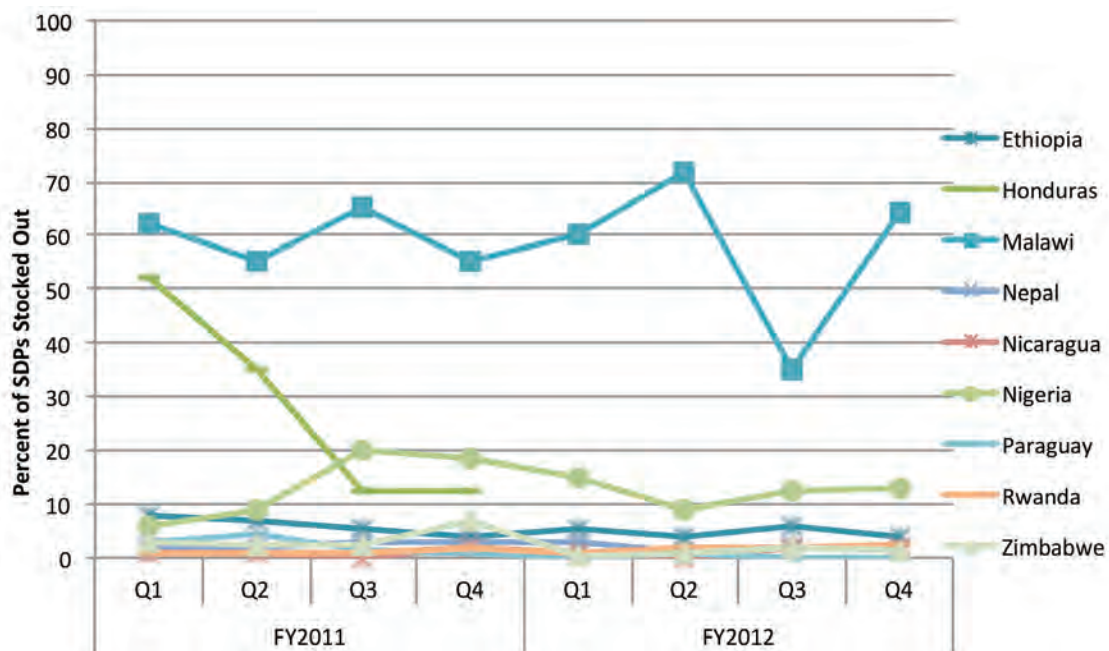


Figure 17. Stockouts of Combined Oral Contraceptives at Service Delivery Points, FY2011-2012



Appendix 2

Strengthening Key Supply Chain Functions

Forecast Accuracy

Accurately forecasting contraceptive requirements is one key piece in an effective and well-functioning supply chain. To assess contraceptive forecast accuracy in project countries, the forecasted monthly consumption of a contraceptive is compared to actual consumption recorded at the end of the year. For contraceptives, the *median* difference between the actual and the forecasted quantities during one year determines the forecast accuracy for each product. The absolute median error across all products forecasted in a country determines the contraceptive forecast accuracy for that country. This measure is the MAPE.

Optimum forecast error (i.e., the absolute percentage variation between the forecasted and the actual consumption of a contraceptive) should be 25 percent or less (see figure 18). The smaller the percentage, the better the forecast accuracy, which is consistent with the benchmark set by Smith (1997) for U.S.-based commercial industries.

In calendar year 2011, 10 TO4 project presence countries recorded a median forecast error of 30 percent across the six most common products.¹ This represents a 5 percent increase over last year's error, just over the project's benchmark of 25 percent error or less. Forecast error increased for five of the six common products. Error was reduced only for male condoms, which had a median forecast error of 23 percent (12 percent lower than 2010).

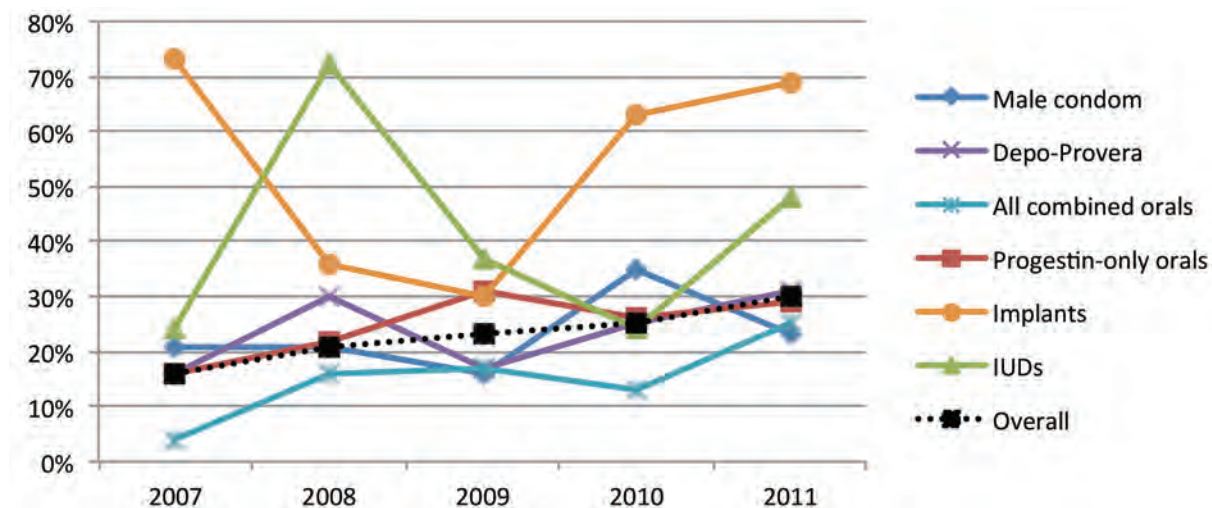
The project analyzed forecast error for the New and Underutilized Methods (NUMs) in 2011, collaborating with the Institute of Reproductive Health (IRH) at Georgetown, and Population Services International (PSI). NUMs include intrauterine devices (IUDs), female condoms, implants, cycle beads, and emergency contraceptives. This analysis showed that NUMs have higher forecast error rates than non-NUMs.

When all products' (NUMs and non-NUMs) error rates are combined, median forecast error rises to 47 percent. However, although error increased across products, there were gains in forecast accuracy at the country level.

Four countries experienced a welcome decline in their error rates (Ghana, Liberia, Malawi, and Mozambique). Four of the 10 countries—Ethiopia, Ghana, Pakistan, and Zimbabwe—met the project's benchmark of 25 percent error or less; two other countries—Mozambique and Rwanda—missed the benchmark by only one or two percentage points. Some programs with consistently low error rates in the past two years had an increase in error—Rwanda, Tanzania, and Zimbabwe—however, Rwanda and Zimbabwe still met the benchmark. This year, for the first time, Ethiopia reported their error rates for the 2011 forecast, starting at

¹ The six common products are combined oral pills, Depo-Provera, implants, IUDs, male condoms, and progestin-only pills.

Figure 18. Forecast Error Rates by Product, 2007–2011, Measured in MAPE



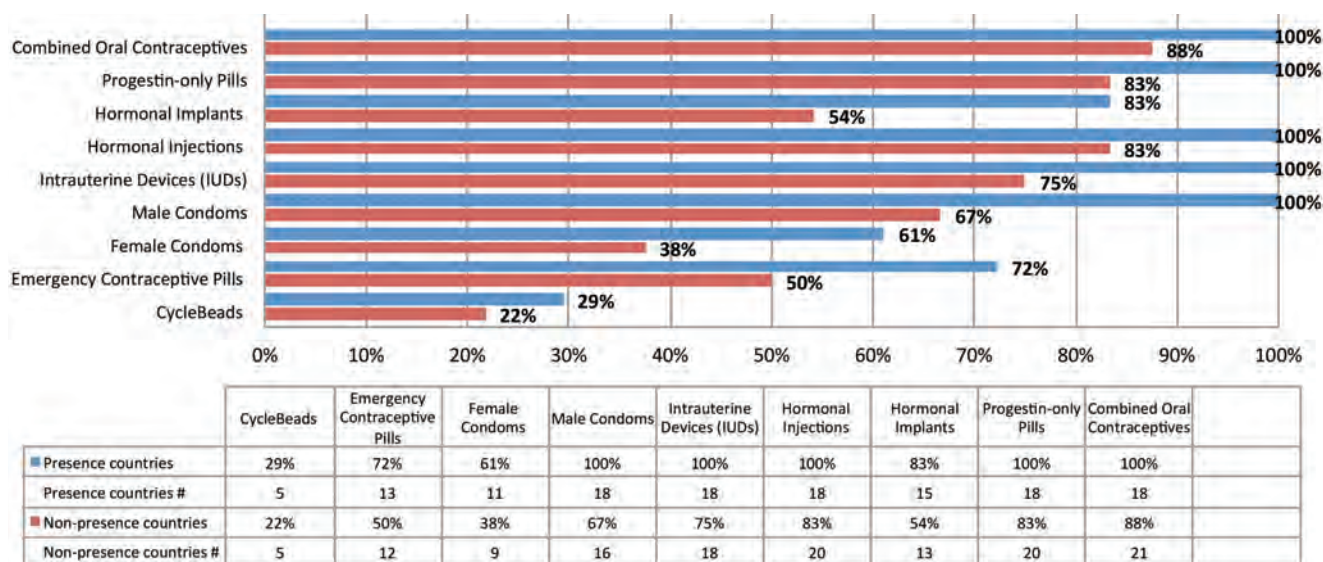
17 percent for the six common products. Table 1 shows the median forecast error rates for the six common products, by country.

As noted last year, countries with functional logistics systems that use their logistics data for forecasting performed better in this analysis than those that rely on demographic data, or those with poor logistics systems for contraceptives. This is especially true for countries with the highest error rates—Liberia, Malawi, Tanzania and Zambia; most rely on a mix of central-level logistics data and demographic data for forecasting.

Table 1. Median Forecast Error Rates (six common products) in Project-Presence Countries

Country	2006 (%)	2007 (%)	2008 (%)	2009 (%)	2010 (%)	2011 (%)
Ethiopia						17
Ghana	33	63	34	28	33	16
Liberia				57	80	63
Malawi	21	207	30	49	97	61
Mozambique	151	15	15	18	102	27
Pakistan					11	5
Rwanda	17	12	8	3	7	26
Tanzania	22	13	30	35	21	52
Zambia			70	40	59	131
Zimbabwe					10	24

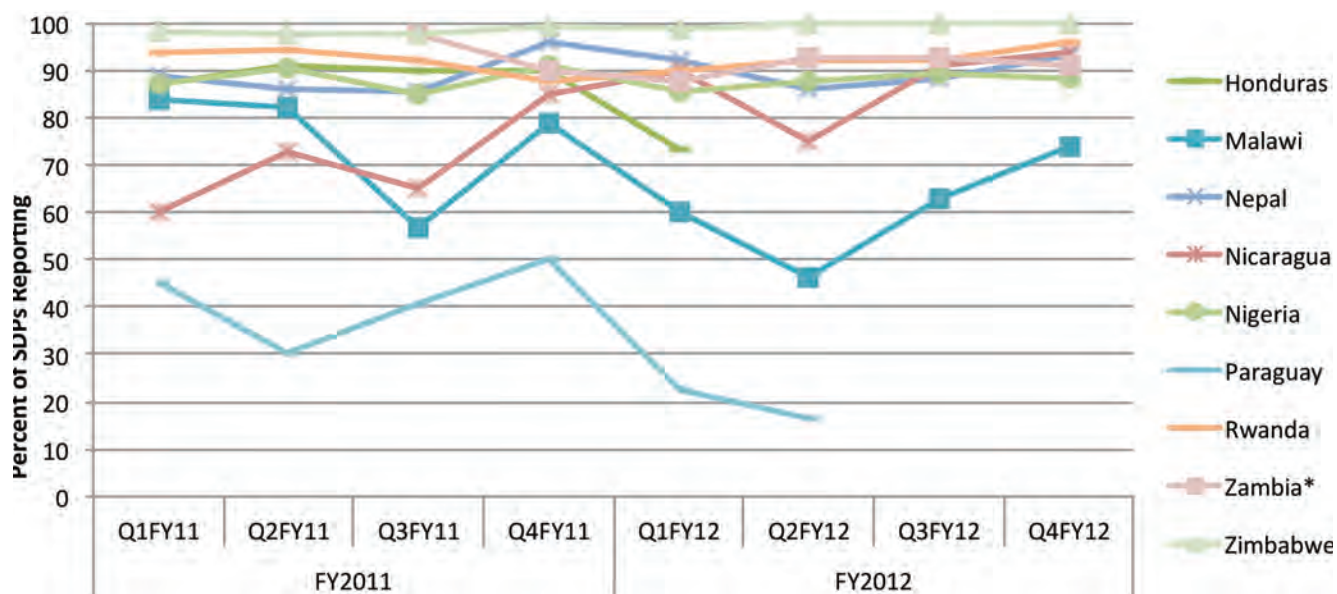
Figure 19. Number and Percentage of Countries with Each Method on National Essential Medicines List, by Method



Health Facility Reporting Rates

Fifty percent of project-presence countries (9 of 18) also track reporting rates from the SDP level; they were available through each country’s LMIS. Zambia’s reporting rates for antiretroviral medicines from its LMIS are also included in figure 20, which presents SDP-level reporting rates from FY2011–FY2012. The TO4 Bolivia office opened in FY2012; they began reporting in the 2nd quarter; however, the field office only submitted data for two quarters; therefore, the contraceptive availability data for Bolivia are not included above.

Figure 20. Reporting Rates in Project-Presence Countries with an LMIS That Routinely Reports Stock Status from the SDP Level, FY2011-2012



In almost all the countries, reporting rates have remained consistently high, averaging around or above 80 percent during each quarter since the USAID | DELIVER PROJECT began. During the past two years, half of all reporting countries have maintained an average of almost 90 percent or even higher reporting rates—Nepal, Nigeria, Rwanda, Zambia (for antiretrovirals), and Zimbabwe.

In Nicaragua, reporting rates have continued to rise over the past few years, increasing from an average of 71 percent in FY2011 to 88 percent in FY2012, as the country continues to roll out a national integrated LMIS. In Paraguay, reporting rates dropped drastically at the end of FY2009 after contraceptives were integrated with other health commodities; rates have remained low. Most recently, Malawi's reporting rates have remained low compared to earlier years.

Appendix 3

Building Local Capacity

Table 2. Number and Percentage of Trainees at Regional and Central Levels in Project-Presence Countries Still Performing the Supply Chain Functions for which they were Trained for by the Project (since October 1, 2010)

Country	Women			Men			Regional					
	Number trained	Number still performing SCM functions for which they were trained?	Percentage (%)	Number trained	Number still performing SCM functions for which they were trained?	Percentage (%)	Number trained	Number still performing SCM functions for which they were trained?	Percentage (%)	Number trained	Number still performing SCM functions for which they were trained?	Percentage (%)
Bolivia	12	no data					1045			347		
Ethiopia	25	no data		98	no data		34	no data		214	no data	
Ghana	42	6	14	61	10	16	329			465		
Guatemala												
Guinea												
Liberia	21		0	123			10			56		
Malawi	2	2	100	9	6	67	406*	102*	100*	1037*	373*	100*
Mozambique	30			34			259			101		
Nepal	2	2	100	9	6	67	763	763	100	1696	1687	99
Nicaragua	0	0		3	3	100	589	589	100	295	295	100
Nigeria**	4	4	100	7	7	100	920	908	99	585	581	99
Pakistan	1	1	100	22	22	100	44	44	100	132	132	100
Rwanda	1	no data		4	no data		702	no data		564	no data	
Tanzania	1	1	100	3	3	100	2	2	100	4	4	100
Zambia	1	unknown		2	unknown		1462			1,764	79 (men & women)**	
Zimbabwe	13	unknown		27	unknown		23	unknown		33	unknown	

*Training totals are for all district personnel types in Malawi (District HSAs and District In-Charges; note: not regions). The—still performing SCM functions for which they were trained—only apply to district in-charge personnel. One hundred percent of district in-charge personnel (both men and women) continue to carry out SCM functions.

**Empirical determination of trained staff remaining in a logistics position was not conducted. Estimates were made by project Public Health field staff working in Bauchi and Sokoto. However, no estimates are available for Kano.

***The Zambia team interprets regional as any staff below the central level, including district- and SDP-level staff. Because of the large numbers of people trained, the project can no longer follow up directly with everyone trained to assess the actual number of trainees who are still performing the SCM functions for which they were trained. During the sites visits for monitoring and evaluation, the project collects data on the percentage of facilities with a trained staff member. This percentage is represented here for October 1, 2010–September 30, 2012, but it cannot be broken down for men and women.

Table 3. Value of Local and Regional Subcontracts

Country	Name of Subcontractor	Value of Work Order (U.S.\$)	Description of Work Order
Ethiopia	ESAMI	48,555.00	Training: Overview of supply chain and quantification
Malawi	City Motors Ltd.	70,140.00	Manages the fuel supply for the parallel supply chain
Malawi	RTT	1,501,068.85	Parallel supply chain—warehousing
Malawi	Cargo Management Logistics	1,057,427.37	Parallel supply chain—distribution
LAC Regional	PRISMA	6,233.95	Core-funded graduation ceremony
Nepal	DPR Solutions Pvt. Ltd.	36,994.60	Support for functioning of web-based logistics management information system and inventory management system in 75 districts
Nepal	Patan Iron and Steel Industries Pvt. Ltd	42,149.00	Storage equipment (racks and cupboards)
Nepal	Aakriti International	11,250.00	Plastic pallets
Nepal	B Singh Transport	4,418.75	Transportation of storage equipment to districts
Nepal	Alliance Consults Pvt. Ltd.	4,618.88	Architectural design of central warehouses
Zambia	Express Mail Service (EMS)	3,800.00	Courier services to transport reports from districts to the Medical Stores Limited
Total value of local/regional sub-contracts		U.S.\$2,786,656.40	

Table 4. Number and Percentage of Local or Regional Hire Field Office Staff

Country	Regional Hires		Local Hires		Total Field Office Staff	Percentage of Total Regional/ Local Hires Field Office Staff (%)
	Men	Women	Men	Women		
Bolivia			1	2	3	100
Ethiopia			62	16	80	98
Ghana	1		10	3	14	100
Guatemala			1	1	2	100
Guinea			1		1	100
Liberia*		1	4	2	7	100
Malawi*	2		12	4	18	100
Mozambique*			10	5	18	83
Nepal			6	5	11	100
Nicaragua			3	3	6	100
Nigeria*			47	24	74	96
Pakistan			19	1	20	100
Paraguay**	1		2	4	7	100
Rwanda*	1		6	3	10	100
Tanzania*	1		10	7	18	100
Zambia*	1		104	34	151	92
Zimbabwe*			12	10	23	96
TOTAL	7	1	310	124	463	95%

*Some staff share time with other task orders or the Supply Chain Management System (SCMS).

**Office closed 5/2012.

Total includes expatriate staff.

Appendix 4

Strengthen Environments for Commodity Security

Table 5. Project-Presence Countries with Conducted and Disseminated Market Analysis Using the Most Recent DHS or RHS Data, by Funding Source

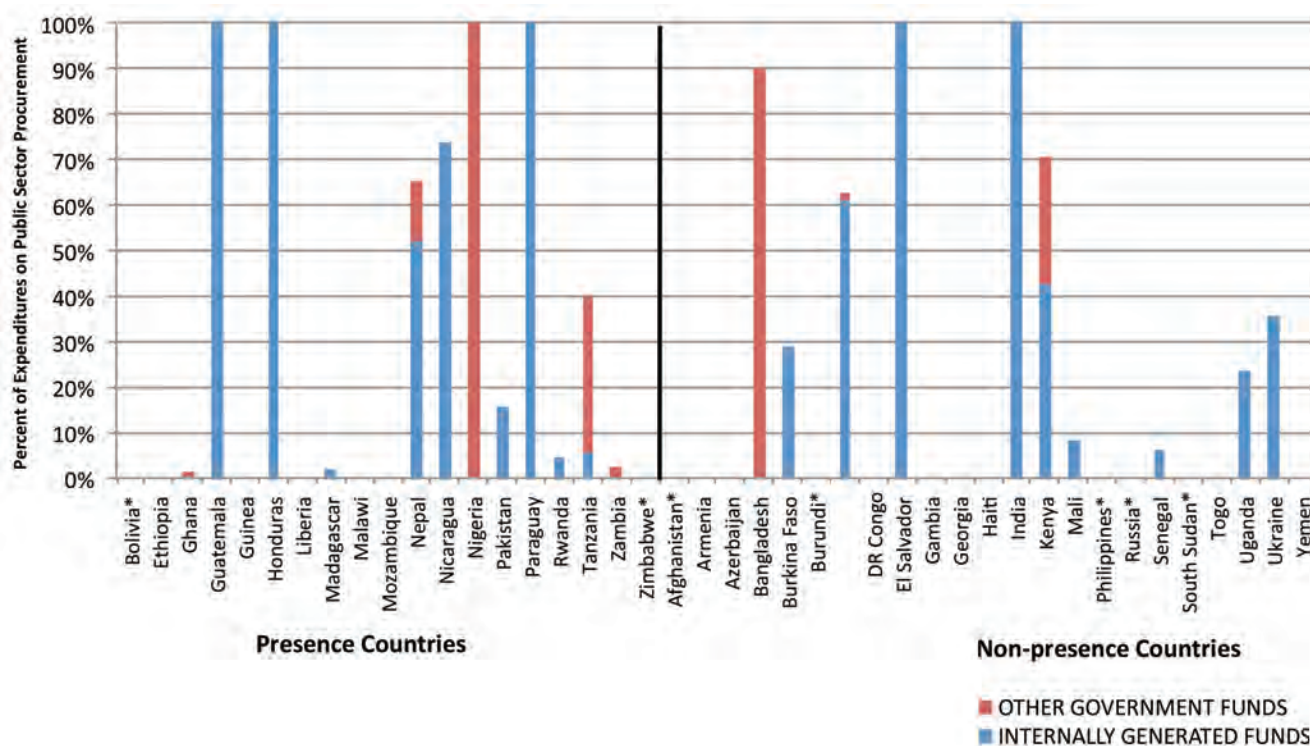
Latin America and the Caribbean Contraceptive Security	UNFPA	Core/Field Support
Bolivia	Malawi	Ethiopia
Dominican Republic	Zimbabwe	
El Salvador		
Honduras		
Nicaragua		
Paraguay		
Peru		
Guatemala		

Note: DHS is the Demographic and Health Survey; RHS is the Reproductive Health Survey.

Table 6. Strengthening Environments for Commodity Security—Contraceptive Security Indicator Data

Indicator		Project-Presence Countries		Non-Presence Countries		Total	
		Number	Percentage	Number	Percentage	Number	Percentage
2.1	Countries with active contraceptive security coordinating mechanism in place	18	100	20	83	38	90
2.2	Countries with current commodity security strategies developed	16		17		33	
2.4	Countries with government budget line item for procuring contraceptives	14	78	10	45	24	60
2.5	Countries spending government funds on procuring public-sector contraceptives	12	76	12	57	24	63

Figure 21. Percentage of Total Funding Spent From Government Funds to Procure Public-Sector Contraceptives, by Country



Note: Russia is excluded from figure 23 because no government funds or in-kind donations were spent on contraceptives for the public sector.

Appendix 5

Knowledge Management and Communications

International Association of Public Health Logisticians Membership

Of the 1,418 members of the International Association of Public Health Logisticians (IAPHL), the gender is known for 1,050 members; 64 percent are male, and 36 percent are female.

Table 7. IAPHL Membership Disaggregated by Country

Indicator 3.8 Active IAPHL Members Disaggregated by Country

Country	Members	Country	Members
Albania	1	Malawi	24
Angola	1	Malaysia	1
Australia	8	Mali	4
Azerbaijan	1	Mexico	1
Bangladesh	18	Mongolia	1
Barbados	1	Morocco	1
Belgium	5	Mozambique	12
Benin	1	Myanmar	3
Bolivia	1	Namibia	9
Botswana	10	Nepal	11
Brunei	2	Netherlands	8
Burkina Faso	8	Nicaragua	1
Cameroon	5	Niger	2
Canada	1	Nigeria	150
Central African Republic	1	Norway	1
Colombia	2	Pakistan	16
Costa Rica	1	Palestinian Territory	1
Democratic Republic of the Congo	10	Papua New Guinea	4
Denmark	6	Paraguay	3

Dominican Republic	1
East Timor	1
Ecuador	1
Egypt	1
Eritrea	1
Ethiopia	60
Fiji	2
Finland	2
France	23
Georgia	1
Ghana	23
Greece	1
Grenada	1
Guatemala	2
Guinea	2
Guyana	3
Haiti	4
Honduras	7
India	17
Indonesia	12
Ireland	1
Italy	1
Ivory Coast	5
Kenya	22
Kyrgyzstan	1
Lesotho	1
Liberia	11
Madagascar	10
Peru	3
Philippines	5
Portugal	1
Republic of the Congo	1
Rwanda	27
Saudi Arabia	1
Senegal	6
South Africa	12
Spain	5
Sri Lanka	1
Sudan	1
Swaziland	2
Switzerland	6
Syria	1
Tajikistan	3
Tanzania	45
Thailand	4
Togo	1
Uganda	34
Ukraine	1
United Arab Emirates	1
United Kingdom	25
United States	246
Uzbekistan	1
Vietnam	4
Yemen	1
Zambia	45
Zimbabwe	39
Undetermined	343

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