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UGANDA: FINAL COUNTRY REPORT



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DELIVER
No Product? No Program. Logistics for Health

UGANDA: FINAL COUNTRY REPORT

DELIVER

DELIVER, a six-year worldwide technical assistance support contract, is funded by the U.S. Agency for International Development (USAID).

Implemented by John Snow, Inc. (JSI) (contract no. HRN-C-00-00-00010-00) and subcontractors (Manoff Group, Program for Appropriate Technology in Health [PATH], and Crown Agents Consultancy, Inc.), DELIVER strengthens the supply chains of health and family planning programs in developing countries to ensure the availability of critical health products for customers. DELIVER also provides technical management of USAID's central contraceptive management information system.

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Abstract

From October 2001 to October 2006, the DELIVER project provided logistics technical assistance to the Uganda Ministry of Health and other health services systems. Technical assistance was provided across the full range of logistics activities: forecasting and quantification, procurement tracking, storage and delivery, and information systems for decision making. Commodity areas support began with essential drugs, contraceptives, and condoms, then expanded to include drugs to treat tuberculosis, malaria (including bed nets), sexually transmitted infection, and opportunistic infection drugs; antiretroviral drugs; and HIV test kits, vaccines, and laboratory supplies. USAID provided DELIVER with technical and financial support.

During these five years, Uganda made substantial improvements to the logistics systems, commodity availability, ordering and delivery systems, and logistics management information systems information gathering and use. Improvements from 2001 to 2006 are recorded in a detailed results table in this report. Recommendations for future needs and future attention are also detailed.

DELIVER

John Snow, Inc.
1616 North Fort Myer Drive, 11th Floor
Arlington, VA 22209 USA
Phone: 703-528-7474
Fax: 703-528-7480
Email: deliver_project@jsi.com
Internet: www.deliver.jsi.com

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ACRONYMS

ACP	AIDS Control Program
AD	auto-disabled syringe
ART	antiretroviral treatment
ARV	antiretroviral drug
CD4	cluster of differentiation 4 cells
CDC	Centers for Disease Control and Prevention
CoCU	Condom Coordination Unit
CPHL	Central Public Health Laboratory
CPT	contraceptive procurement table
DANIDA	Danish International Development Agency
DFID	Department for International Development (United Kingdom)
ED	essential drugs
EGPAF	Elizabeth Glaser Pediatric AIDS Foundation
EPI	Expanded Programme on Immunization
FBO	faith-based organization
GAVI	Global Alliance for Vaccines and Immunization
GFATM	Global Fund to Fight AIDS, Tuberculosis and Malaria
HC	Health Center (specific name)
HMIS	health management information system
HSD	health sub-district
HSSP	Health Sector Strategic Plan
IRCU	Interreligious Council of Uganda
IRS	indoor residual spraying
JCRC	Joint Clinical Research Center
JHU	Johns Hopkins University
JMS	Joint Medical Stores
LMIS	logistics management information system
LSAT	Logistics System Assessment Tool
M&E	monitoring and evaluation
MAP	Multisectoral AIDS program
MMIS	Making Medical Injections Safer (project)

MOH	Ministry of Health
MOU	memorandum of understanding
MSF	<i>Medecins Sans Frontieres</i> (Doctors Without Borders)
MSI	Marie Stopes International
NGO	nongovernmental organization
NIH	National Institutes of Health
NMS	National Medical Stores
NTLP	National Tuberculosis and Leprosy Program
OI	opportunistic infection
PEPFAR	President's Emergency Plan for AIDS Relief
PMI	President's Malaria Initiative
PMTCT	prevention of mother-to-child transmission
PSI	Population Services International
QAP	Quality Assurance Program
RCT	routine counseling and testing
RH	reproductive health
SIDA	Swedish International Development Cooperation Agency
STI	sexually transmitted infection
TB	tuberculosis
TOR	terms of reference
UNEPI	Uganda National Expanded Program for Immunization
UNFPA	United Nations Fund for Population Activities
UNICEF	United Nations Children's Fund
USAID	U.S. Agency for International Development
VCT	voluntary counseling and testing
WB	World Bank
WHO	World Health Organization

ACKNOWLEDGMENTS

In Uganda, in the five years from October 2001 to September 2006, the DELIVER project contributed to major improvements in logistics systems; expanded the availability of drugs and medical supplies; increased commodity funding; and improved warehouse efficiency and product delivery, and procurement harmonization across programs. Project work covered a wide range of commodities, including essential drugs, contraceptives, condoms, antiretroviral drugs, HIV test kits, vaccines and laboratory supplies; and drugs to treat sexually transmitted infection (STI), opportunistic infection (OI), tuberculosis (TB), and malaria (including bed nets).

DELIVER did not work in isolation but with a wide range of partners—collaborators and Ministry of Health (MOH) programs came together to achieve these improvements. Because the project covered a span of five years, it is impossible to identify and acknowledge the work of all the individuals who made these improvements possible, but it was the quality of their work and the commitment over time that made the program successful. We would, however, like to acknowledge with gratitude the key organizations that worked with DELIVER in Uganda.

The U.S. Agency for International Development (USAID) Mission provided technical support, policy direction, and funding, which increased as the project's logistics objectives expanded. We believe this investment in improved logistics systems helped protect the substantial investments in commodity procurement and program development that were made by both the U.S. Government and the Government of Uganda. DELIVER also worked closely with the Centers for Disease Control and Prevention in developing, quantifying, and implementing the new laboratory credit line; and in the HIV testing expansion.

The MOH was the key DELIVER counterpart. The project worked closely with senior managers of the different MOH programs to create logistics systems for different commodities, and also worked with their staff in the day-to-day implementation of these programs. DELIVER was very fortunate to work with excellent counterparts in the AIDs Control Program (ACP), Uganda AIDS Commission (UAC), National Tuberculosis and Leprosy Program (NTLP), Pharmacy Section, Reproductive and Maternal Health Department, Uganda National Expanded Program for Immunization (UNEPI), Malaria Department, MOH Resource Center, and Central Public Health Laboratory (CPHL). Logistics systems were successful because they had top-level support from the Minister of Health, Director General, and Deputy Directors of Clinical Programs and of Infectious Diseases. Without this strong support from the MOH, very little would have been accomplished.

The linchpin of commodity delivery services in Uganda is the two national warehouse systems, the National Medical Stores (NMS) and the Joint Medical Stores (JMS). DELIVER worked most closely with the NMS to improve their operational efficiency, costing, and delivery scheduling. We coordinated closely with the JMS, the nongovernmental organization/faith-based organization (NGO/FBO) warehousing system, and began providing limited technical assistance near the end of the DELIVER project. Complementary objectives with both organizations to improve commodity supply ensured close collaboration at both management and implementation levels.

DELIVER also acknowledges the technical support and often commodity provision from the World Health Organization (WHO), the World Bank, United Nations Children's Fund (UNICEF), and United Nations Children's Fund (UNFPA). Policy advocacy and commodity coordination was a regular part of logistics work with Danish International Development Agency (DANIDA), Department for International Development (UK) (DFID), IRISH AID, Swedish International Development Cooperation Agency

(SIDA), and other bilateral donors. With NGOs, DELIVER worked most closely with Joint Clinical Research Center (JCRC), Interreligious Council of Uganda (IRCU), *Médecins Sans Frontières* (MSF) (France), Save the Children (U.S. and Europe), MildMay; and the social marketing groups Population Services International (PSI), Marie Stopes International (MSI), and the African Foundation for Development (AFFORD). Crown Agents was also a close technical partner.

Over the course of five years, there were more than 45 technical assistance visits from Washington-based staff and other consultants. This technical and administrative support from the Washington DELIVER office strengthened the logistics work done in Uganda.

In addition to our counterparts and contributing organizations, another key to the broad success of the logistics work in Uganda was the DELIVER staff in Uganda. The team grew gradually and developed an expertise that proved invaluable. Their commitment to improving commodity availability led to long hours, emergency efforts to fix commodity availability problems, and demanded great attention to detail. See the appendix [add letter] for the complete staff list from the beginning of the project, but this is just a small way to recognize the commitment of these individuals to improving health delivery in Uganda. We had a technically competent and committed team, and their expertise and experience will continue to be used in Uganda for years to come.

Impressive advances to logistics systems in Uganda were accomplished in these five years, though much remains to be done. The organizations acknowledged above and the individuals staffing those organizations deserve the credit for the successes that are detailed in this final report.

EXECUTIVE SUMMARY

With USAID support, DELIVER began providing logistics technical assistance in Uganda in October 2001; the support lasted for five years. This assistance initially focused on essential drugs, contraceptives, and condoms. With increasing need from the MOH and USAID programs for logistics technical support across a wider variety of program commodities, DELIVER's work evolved over time, adding programs and new commodities. These eventually included logistics systems and support for antiretroviral (ARV) drugs, prophylactic cotrimoxazole, HIV test kits, vaccines and laboratory supplies; and drugs to treat STIs, OIs, TB, and malaria (including bed nets), while continuing the original support for essential drugs, contraceptives, and condoms.

In five years, DELIVER was instrumental in helping implement key improvements to logistics systems in Uganda, specifically focusing on forecasting, procurement, ordering and delivery systems, and product tracking. The essential drug delivery system was transformed from a *push* system to a *pull* demand system, with more than 85 percent of each local facility choosing their own supplies under the credit line. The NMS changed from a pass-through distribution of essential drug kits to an organization that receives and packs individual orders for 1,917 health facilities every two months. Condoms and contraceptives were added to the essential drug distribution system. An ARV distribution system was designed from the beginning; it now serves more than 35,000 MOH patients in more than 220 facilities, every month. HIV testing went from 30,000 tests a year to, four years later, over one million tests per year. A laboratory credit line was created and is providing more than U.S.\$2 million worth of dedicated supplies to 960 MOH and NGO laboratories. The UNEPI vaccine distribution system was strengthened, and the TB drug system was transformed to a consumption-based supply system.

But, much remains to be done. As coverage of specific commodities increases; as policies are improved to provide more individualized treatment, particularly for antiretroviral treatment (ART); as programs are integrated to improve coverage and treatment options; and as patient numbers expand, logistics supply lines must be increasingly flexible, increasingly precise, and completely reliable.

These requirements put pressure on warehouse and delivery systems, and on product tracking and information systems.

Many of the requirements are already in place:

- Logistics systems have been designed, and are in place and working.
- Record keeping forms are created and institutionalized within the MOH and NGOs.
- Computer logistics management information systems (LMIS) systems are in place.
- Staff have been trained in logistics ordering.
- Forecasting and logistics data systems are created and working.

But with product demand doubling every few years—

- Changes will be needed to make these new systems sustainable, more effective, and more efficient.
- New treatment policies will require more sophisticated delivery and tracking systems.

- Solutions must be found for limited government budgets and unanticipated emergency threats to product availability.
- Procurement and cross-program coordination must be harmonized.

BACKGROUND

COUNTRY CONTEXT

Uganda has transformed itself from a war-torn country to a potential model for African development. It has achieved political stability, impressive economic growth, and progressive social reforms, such as the doubling of primary education enrollment and reduction of HIV/AIDS prevalence from 30 percent to 6.4 percent. Despite these achievements, 35 percent of the population still lives on less than \$U.S.1.00 a day. High population growth rates and continued transmission of HIV/AIDS are further eroding the progress made during the last decade.

Uganda's population in 2006 is estimated at more than 28 million, with a total fertility rate of 6.9. Compared to regional neighbors, Uganda suffers from a high burden of disease. Seventy-five percent of life-years lost to premature deaths are due to 10 preventable diseases. Twenty percent of these deaths result from prenatal- and maternal-related conditions. The use of family planning is low in the country, with only a small percentage of married women using modern contraception, even though more than 90 percent of women reported knowing about modern contraceptive methods. The effects of massive poverty are threatening the quality of life of the poor in Uganda, and HIV/AIDS is impacting both health services and the social fabric of the country. As long as household incomes remain low, HIV/AIDS transmission continues and health service budgets are constrained, health indicators will continue to be poor and will impede the country's development.

As with many nations, the budget for formal health services remains below the levels needed, and is only a very small percentage of the national budget. Between 50 and 70 percent of the MOH budget for drugs and services is provided by donor organizations. Much of these funds come through recent global health initiatives: the Global Fund for AIDS, Malaria and Tuberculosis (GFATM), the President's Malaria Initiative (PMI), and the Presidents Emergency Program for AIDS Relief (PEPFAR).

Health services, while having made substantial progress in the last ten years, are constrained by insufficient funds, inadequate infrastructure, and human resource/personnel constraints. Some health indicators, such as vaccination coverage and ARV treatment coverage, have substantially improved; but others—maternal deaths or contraceptive use—have stagnated. Drug supply has increased greatly in the last five years, but it is still less than half the amount needed to meet the minimum government-committed standards, meaning that drugs are always in short supply and will continue to be so for the foreseeable future. NGO health facilities provide for 20–30 percent of health services, work closely with MOH programs, and have started receiving some MOH medical supplies in the last three years. Substantial investments in health sub-district (HSD) facilities are bringing health service access closer to the general population.

KEY PLAYERS AND ROLES

In 2001, DELIVER was invited by the MOH and the U.S. Agency for International Development (USAID) to establish a resident logistics advisor within the MOH to help improve logistics services for essential drugs and family planning commodities. As the need evolved, DELIVER became involved with the design and development of logistics systems for vaccines, TB drugs, ARVs, HIV test kits, sexually transmitted infection (STI), and opportunistic infection (OI) drugs, anti-malarial drugs and bed nets, condoms, and, most recently, laboratory supplies, while maintaining support for contraceptives and essential drugs. Inter-related logistics systems are now in place for almost all key medical commodities in Uganda.

The MOH is the primary DELIVER counterpart. Work began with essential drugs and contraceptives, but soon expanded to the Condom Coordination Unit (CoCU) of the MOH, the National Tuberculosis and Leprosy program (NTLP), the Uganda National Expanded Program for Immunization (UNEPI) with vaccine logistics, and the Central Public Health Laboratories (CPHL) with the new laboratory credit system. Much work was done with the AIDS Control Program (ACP) of the MOH, starting with preventing mother-to-child transmission (PMTCT) and voluntary counseling and testing (VCT) systems for HIV test kits. Extensive work was done with ACP to design, test, and implement an ARV drug ordering, tracking and delivery system. HIV/AIDS products now being tracked included Diflucan, nevirapine for PMTCT, and condoms for the AIDS Control Program.

The government immunization program is implemented through UNEPI; DELIVER has been working directly with UNEPI since 2003 to improve logistics coordination. UNICEF is a key immunization supporter and provides much of the vaccine supply, but the Global Alliance for Vaccines and Immunization (GAVI) and now the Gates Foundation also provide vaccines and support for routine and mass immunization campaigns.

The Danish International Development Agency (DANIDA) has long been involved in supporting the MOH pharmacy section and the development and expansion of the National Medical Stores (NMS). This support includes the purchase of a significant portion of the MOH drug supplies (with the balance directly from the MOH budget.) DANIDA originally helped expand and strengthen the NMS capacity to warehouse, process orders, and distribute supplies.

The Joint Medical Stores (JMS) is a faith-based national warehouse that supports the FBO and NGO community. They provide an effective cash-and-carry system for 20–30 percent of the health facilities in Uganda; and export to the Democratic Republic of the Congo, Rwanda, and southern Sudan. JMS works closely with the MOH system. At present, they have no delivery system and each facility must collect its own supplies, except for ARVs, which are directly delivered to sites within the Kampala area.

For many years, the World Bank, through the Multisectoral AIDs Program (MAP), provided condoms, STI, and OI drugs, and other commodities, although the direct commodity provision was reduced when the GFATM program started.

The World Health Organization (WHO) provides technical and policy guidance, and its staff serve as technical advisors to the MOH. They help coordinate some logistics activities. DELIVER has collaborated closely with WHO on the planning and procurement of ARVs and bed nets.

GFATM provides commodities and other financial support for HIV/AIDS, TB, and malaria. DELIVER assisted the MOH when they applied for and secured more than U.S.\$240 million in Round I and Round III applications. More than half of this money was for ARVs and other medical supplies. In August 2005, the GFATM grants to Uganda were suspended following an investigation by GFATM Geneva into the management of this fund. Although funding was restarted in October 2005, the suspension disrupted supplies, and may continue to have a profound effect on timely in-country drug procurement and shipping for some time.

USAID, through PEPFAR support, is a key player for HIV/AIDS; PEPFAR funding began to flow into Uganda in 2003. DELIVER, was an early recipient of PEPFAR funding, was able to help the MOH rapidly expand its PMTCT and VCT testing, and provide ARV treatment and palliative care services. Much of the PEPFAR support to the MOH was indirect, with substantial funds going to develop the NGO and FBO sector in identification, prevention, and treatment of HIV/AIDS. Recently, PEPFAR provided additional support to the MOH laboratory services; DELIVER actively supported the planning, development, and quantification of the new laboratory credit line supply system.

The Joint Clinical Research Center (JCRC) was one of the first organizations in Africa to provide ARV treatment, and it has greatly expanded its ARV provision with PEPFAR and non-PEPFAR funds.

DELIVER has worked closely with JCRC to provide logistics systems for its expansion of both ARV sites and patient numbers. We started work with JCRC to begin the design process for a logistics system for their six *Centers of Excellence* laboratories. DELIVER would like to continue work with them in the future on the improvement of or access to other procurement options.

UNFPA has been a traditional supporter of reproductive health commodities in Uganda; DELIVER has worked closely with them in coordinating procurement and family planning product delivery, as well as logistics capacity building activities at the national level.

Uganda has an extensive NGO system with a wide range of players, providing many types of services. Because the *No Product, No Program* concept also applies to NGO services, DELIVER has frequently provided a bridging mechanism between the NGO and MOH services, and with the MOH, has continuously provided information on commodity availability.

KEY CHALLENGES

In five years, DELIVER has been instrumental in key improvements to the logistics systems in Uganda, specifically focusing on forecasting, procurement, ordering and delivery systems, and product tracking. The essential drug delivery system was transformed from a *push* system to a *pull* system in early 2003, with more than 85 percent of each local facility choosing their own supplies under their credit line amount limit. The National Medical Stores changed from a pass-through distribution of essential drug kits to receiving and packing individual orders for approximately 1,900 health facilities. Condoms and contraceptives were added to the essential drug distribution system, with supplies being delivered every two months. An ARV distribution system was designed and is now serving more than 35,000 MOH patients in over 220 facilities every month. HIV testing went from 30,000 tests in 2001 to over one million tested in 2006. In 2005, a laboratory credit line was created and it will provide more than U.S.\$2 million worth of dedicated supplies to 960 MOH and NGO labs each year during the next five years.

Throughout this period, DELIVER faced a number of significant challenges—some were overcome, some remain. The most substantial threat to providing commodities in Uganda was the third party procurement failures. When committed supplies did not arrive or were eight months late, there were major commodity failures. The systems design, with six months of buffer stock, could not cope with delivery failure that lasted eight months or longer. This failure occurred with condoms, TB drugs, test kits, and other products. Frequently, the MOH was not notified about these contract and procurement failures until it was too late to make in-time adjustments.

Another challenge was the donor coordination of third party supplies. To have systems working effectively, each commodity area should have had full information on what was committed, when it would arrive, and hopefully, some influence on shipment scheduling—to prevent a year's supply from arriving all at once or a year's supply arriving from two separate sources. With the wide range of donors, different donor objectives, and surprisingly reluctant information sharing, collecting enough information to make efficient decisions was a definite challenge.

With different program areas reluctant to transfer forecasting and procurement decisions outside their control, it was necessary to build logistics capacity within separate program departments, rather than having one clear logistics counterpart. Structurally, this issue was not completely resolved, although several attempts were made to improve it.

Starting new product systems, such as for ARVS or laboratory supplies, took a great deal of coordination and discussion, because there were often so many stakeholders and so many interested parties.

The greatly expanded volume of commodities, the new product lines added to the system and a 30 percent increase in total MOH/NGO sites to which NMS had to distribute products every two months, added

stress to NMSs implementation by of the ordering and distribution system. For the most part, NMS responded very well, but this rapid expansion of system demands was an on-going challenge.

GOALS AND OBJECTIVES

DELIVER'S OBJECTIVES

DELIVER's objectives have expanded over time, as USAID and the MOH requested that logistics technical support be provided for an increasing range of commodities. Originally, DELIVER was asked to improve the delivery of essential drugs, contraceptives, and condoms. This was accomplished by introducing the *pull* system and by integrating contraceptives and condoms into the main drug supply system, which now packs for every site in the country every two months.

USAID and UNEPI then asked DELIVER to improve the vaccine delivery systems. As expensive pentavalent vaccines were added to the immunization program, high wastage rates had to be eliminated; therefore, both the mass campaign and routine immunization systems had to be improved. DELIVER responded by placing a logistics coordinator within the UNEPI office to coordinate strategic planning and to assist with system improvements.

As the MOH responded to the HIV/AIDS threat and as PEPFAR support became a priority for USAID, DELIVER was asked to address commodity security for a variety of HIV/AIDS supplies. This began with logistics support for PMTCT and later included VCT. When the MOH committed to free ARV provision, DELIVER was a key member of the team that designed the ARV logistics system. Implementation began slowly, in June 2004, with 2,250 patients in 26 sites; it rapidly expanded to 35,000 patients in 222 active MOH sites by June 2006. HIV/AIDS products now being supported by DELIVER assistance to the ACP include ARV drugs, HIV test kits, nevirapine for PMTCT and Diflucan for OI treatment.

The initial national commodity survey in early 2002 and the laboratory assessment in 2004 showed that laboratory services were seriously deficient. Commodities and funds were insufficient, laboratory services were not in place, and laboratory technicians and clinicians were not using laboratory testing because of reagent failure. To make clinical decisions about HIV/AIDS, TB, and the management of OIs and malaria treatment, there was an increasing need for accurate laboratory diagnosis. DELIVER worked with the Central Public Health Laboratories and Centers for Disease Control and Prevention (CDC) to design a laboratory reagent and consumables supply system that could provide dedicated commodity funding just for laboratories.

This credit line system began in May 2006 with an initial distribution to 960 MOH and NGO laboratories of \$2 million worth of laboratory reagents. It was so successful in a short time that DELIVER was asked to design a similar laboratory system for the 22 regional hospital-level laboratories.

DELIVER was also asked by USAID and the MOH to assist with the TB drug logistics management. A new system was designed and implemented, focusing on actual drug requirements in the health facilities as opposed to service statistics. This system has already reduced wastage and enabled the NTLP to track TB drug usage and provide better information for efficient procurement planning.

Recently, DELIVER was also asked by the MOH to work with WHO and the MOH malaria program to design a distribution plan for GFATM-provided bed nets. As a result, \$14 million worth of GFATM bed net funds were rescued. DELIVER was then asked to work with the MOH to review and improve the new distribution plan for GFATM Coartem anti-malarial drugs.

USAID also asked DELIVER to work with the JCRC to develop logistics systems to expand JCRC's HIV care and treatment services. These services expanded from 10,000 patients at one central site to 38,000 patients on comprehensive HIV care at 38 sites. JCRC is still using the system. DELIVER has been asked

to provide technical support to a new JCRC logistics laboratory supply system as well. DELIVER also provided logistics advice to other PEPFAR-supported NGOs to expand their HIV/AIDS care and treatment services.

In addition to these core product areas with the MOH, DELIVER assisted the MOH with the strategic planning for the introduction of auto-disable syringes, a policy recently introduced at the national level. DELIVER worked with the National Committee on Injection Safety and Waste Management to complete logistics planning for waste management. Other forms of logistics advice included distribution of deworming tablets, auto-disabled (AD) syringes for the Making Medical Injections Safer (MMIS) program, bed net distribution in the north through UPHOLD and the Malaria Consortium, and laboratory supply systems for the National Institutes of Health (NIH) Rakai laboratory .

In all the systems, DELIVER works with the full cycle of logistics requirements. This begins with product forecasting and demand, then product tracking (DELIVER itself did not purchase commodities during these five years), then ordering and delivery, and as the last piece in the cycle, with commodity tracking and information flow.

Across this wide range of logistics commodity provision, DELIVER maintained a common set of objectives. These included the following:

- Establish effective logistics systems for expanded distribution of specific commodities.
- Work with the MOH to increase drug financing and drug availability.
- Improve capacity in the MOH and NGOs to monitor and manage health logistics systems.
- Improve use of information technology to support procurement and delivery decisions.
- Raise the visibility and capacity of logistics planning to ensure that logistics is automatically included in policy planning.

RELATIONSHIP TO USAID AND CLIENT OBJECTIVES

DELIVER's objectives support the USAID Uganda Mission Strategic Objective 8 (SO8)—to provide improved delivery of health services. The sub-objectives under the SO8 heading are to improve family planning services, to improve HIV/AIDS prevention and treatment, and to build system capacity in the Ministry of Health. In addition, DELIVER was asked to improve the logistics capacity of direct USG NGO/FBO partners to provide HIV/AIDS prevention and treatment services.

Another direct client is the Ministry of Health. USAID's support to DELIVER was one of a few USAID programs that supported national-level public health systems development. A key MOH objective was to provide better health services by increasing the amount and value of products flowing to patients through the MOH system. With limited budgets, another objective was to improve efficiency in procurement and another to reduce wastage in the storage and delivery system. With rapidly expanding programs and new treatment and prevention policies, the MOH was interested in using improved logistics systems for the efficient utilization and maximum use of limited available resources.

DELIVER'S ROLE IN RELATION TO OTHER ORGANIZATIONS

Logistics system improvements were not made in isolation; all improvements were made in collaboration with other donor organizations. But, as a specialized program whose only purpose was logistics improvement of drug availability and access, DELIVER certainly played a key role and was often the coordinating point for logistics activities. Also, DELIVER often found itself as an information source about MOH logistics systems and services related to commodities management—between the MOH and

USAID, between the MOH and other donors, and even between donor organizations. A significant portion of DELIVER's activities were related to information and idea exchange, and in being an enabling organization to improve harmonization and coordination among individual health programs.

DELIVER worked closely with DANIDA in advocating for and making a success of the transition to the essential drug pull system. We also worked closely with DANIDA on improvements to the national medical stores, to the point of coordinating technical assistance needs to NMS. UNFPA was a key partner in reproductive health activities, and UNICEF was a key partner in the UNEPI vaccine programs. We worked closely with WHO on injection safety and waste management issues. In the final few months of the project, DELIVER worked very closely with WHO on the design of the GFATM bed net distribution system.

DELIVER also fulfilled the role of logistics advisors to a variety of USAID programs. We worked closely with the JSI-sister programs in HIV/AIDS, coordinating work at the national level and assisting AIM and UPHOLD to support logistics capacity building and product supply at the district level. We worked closely with Elizabeth Glaser Pediatric AIDS Foundation (EGPAF) on PMTCT-related logistics activities at the district level and joined the HIV/AIDS Quality Assurance Program (QAP) for all their post-supervision learning sessions. Services offered to other NGOs, including Plan International, Save the Children, Mildmay, Baylor University, Johns Hopkins University (JHU), and MSF ranged from logistics technical assistance and advice to facilitation of logistics capacity building activities. (See the appendix for a complete list of the NGOs we assisted, as is the specific assistance provided by DELIVER to various other organizations.)

DELIVER often shared the materials it developed with other NGOs; some were eventually adopted and incorporated into policy documents, logistics management forms, or monitoring and supervision tools. For example, WHO adopted DELIVER materials in the development of the logistics component of their HIV care and supervision tool.

DESCRIPTION OF STRATEGIES

Throughout the expansion of DELIVER's commodity logistics support, there were several key strategic approaches that guided our involvement in logistics improvement.

1. *Focus on the national level.* Most of our technical assistance and systems design were for national-level programs. From the initial logistics assessment, it was clear that the first step would need to be to improve procurement, national-level product availability, and storage and delivery systems from the national level. Even with the additional commodities, which were added regularly, this was still the key focus. DELIVER's limited district- and facility-level work was done through sister organizations, which themselves had a specific mandate to improve systems within districts. National-level systems design focused on quantification, tracking and delivery from the national to the local level, with information technology improvements helping to coordinate and improve national-level decision making on commodity management.
2. *Work within the system.* As a project, DELIVER worked for the programs that requested our support. This ranged from having staff embedded in MOH programs when there was sufficient office space, to having staff that were considered MOH employees. Although we initially faced some challenges, this approach allowed us to work with the confidence of the requesting programs, and we were likely to offer the best advice because we had the most reliable information. We became part of the *inside*, not outsiders looking in.
3. *Involve all stakeholders in the logistics system design.* Our program was able to grow gradually, expanding whenever the MOH or USAID needed our assistance. This expansion involving new commodities at approximately one new system per year enabled us to work through the development

of new logistics ideas over time, involving all major stakeholders at the various stages. In practice, it was often a year-long process to add a new commodity, which included system design, development and adjustment of forms and computer systems, training of end users, and time to make corrections as the system unfolded. This was the pattern in the change to the pull system, the ARV drug delivery system, the TB program, the expanded condom delivery system, the expanded vaccine program, and the laboratory supply credit line. This approach also often involved DELIVER in policy planning as well, because logistics issues often had an impact on policy choices.

4. *Collaborate with all stakeholders.* With the wide range of commodities, there is also a wide range of donors and stakeholders, often with different agendas. As part of our coordination efforts, we tried to provide accurate information to all parties. In addition to the MOH and major donors, it also involved organizations that promoted specific products, pharmaceutical companies, small donors, and organizations with specific policy approaches. Because of our strategic approach and open door policy, we were able to share useful information for critical decision making on commodities management that might have not been shared otherwise.
5. *Improve the national warehouse systems.* NMS and JMS are keys to the distribution of national public sector commodities. With the change to the pull system, NMS had to transform itself into an organization that processes and fills more than 1,900 individual orders every two months. DELIVER assisted with this process, helping with the physical changes in warehouse layouts, exploring barcoding, doing cost analysis studies, and training NMS staff in warehouse management.
6. *Train users in use of the system and use of forms.* As systems were designed or improved, we had to train people to use them correctly. Total numbers of MOH and NGO staff trained are included in the capacity building section below. DELIVER trained people in systems for essential drugs, ARVs, HIV test kits, TB drugs, condoms, and laboratory supplies. It was an MOH requirement that sites had to have three staff trained in the ARV logistics system before they were allowed to receive MOH ARV drugs. Manuals, training curriculums, and computer systems were developed in collaboration with the MOH and other stakeholders, and they are available within each system. National-level training involving all providers was completed for each system. DELIVER also supported logistics training for essential drugs and contraceptives through the JMS system. Forms were designed with the MOH, so logistics forms are now part of the formal MOH health management information system (HMIS), using HMIS form numbers. Additional capacity building activities supported by DELIVER included training on customs clearance processes for UNEPI and other stakeholders that eventually improved the customs clearance processes.
7. *Support the MOH Resource Center as an information repository.* After starting programs and collecting logistics data on commodity management, we helped centralize the logistics system information at the MOH Resource Center, supporting the MOH decision to centralize information. We did not get as far along as we had hoped, but LMIS information is being fed to the Resource Center, with the near-term objective to have this information processed and available automatically.
8. *Advocacy for access to MOH health supplies by NGO/FBOs.* DELIVER was one of the organizations advocating for the MOH to give a portion of public-sector drugs to the Joint Medical Stores, which in turn distributed them through its NGO/FBO network. This product sharing began in 2004; now JMS receives 20 percent of the MOH essential drugs, test kits, ARVs, and laboratory supplies. This was a major policy shift and has worked effectively. DELIVER then supported logistics training through the JMS system.

DELIVER responded to MOH and NGO program requests, and identified missing pieces in logistics systems and attempted to fill them, including policy decisions on specific products from a logistics standpoint. They also included major programs, for example, the design of a laboratory logistics

system; and other programs, which included the design of a logistics system for gas cylinder supply and tracking for the UNEPI program.

9. Gas cylinder tracking forms were designed and staff were trained; the system is now being piloted in two selected districts. An interesting example of the depth of support required was in the laboratory system development, where local reconstitution of laboratory powders was vastly more cost effective, but would require large supplies of high-quality distilled water and special reconstituting equipment. To fulfill the logistics objective, DELIVER had to work with the Central Public Health Laboratory to identify local sources for large amounts of distilled water. With CPHL, we also identified local possibilities for private services to handle the reconstitution of reagents; this approach was successful and more cost effective.
10. *Work toward program integration.* A long-term goal is to have the NMS/JMS system responsible for order processing and delivery of all medical commodities. The MOH staff in the field should be able to complete one order form every two months and have all supplies delivered at the same time. Contraceptives and condoms were added to the basic logistics system early. The TB system was designed on a two-month cycle using similar forms, so that TB drugs can be integrated within the next few years. Likewise, the JCRC ARV forms are very similar to those of the MOH ARV program. The laboratory system is a parallel design to the essential drug system, reserving funds specifically for laboratory supplies but using the same ordering and delivery cycle.

SUMMARY OF DELIVER FUNDING AND STAFFING

DELIVER began with one resident logistics advisor and less than U.S.\$1 million per year. With expanded activities and commodity responsibilities, by the end of five years the staff grew to nine senior logistics advisors and three data entry specialists, with accompanying administrative support staff. These staff and position descriptions at the end of the DELIVER project are included in the appendix.

The budget over the entire five-year program was a total of U.S.\$9,402,434. Initial funding began small when the office and objectives were limited, but grew with increased staff and responsibilities. With proper commodity availability as a critical part of program implementation (No Product, No Program), logistics funding was a worthwhile investment to protect and utilize both USAID and MOH investments in commodity purchase and program inputs.

PROGRAM RESULTS

ELEMENT I: IMPROVED LOGISTICS SYSTEMS

Table 1 documents the improvements in logistics systems since the beginning of the DELIVER project in Uganda in October 2001 to the completion of the DELIVER project in November 2006, a five-year period. The first section records changes in specific commodity products brought about or assisted by DELIVER and the second section includes the system changes in logistics during the same period.

As mentioned before, prior to DELIVER, essential drugs were simply sent out from the national level with no regard to local choices or input. In 2001, contraceptives, condoms, and TB drugs were operating with ad hoc procurement and distribution, vaccine distribution was weak, and there were no systems for ARVS, HIV tests, or laboratory supplies. In 2006, DELIVER's final year of program operations, ordering and delivery systems for all of the above products are functioning reasonably well, though not perfectly.

These systems are now an integral part of the Ministry of Health's provision of medicines and medical supplies. Recording and reporting forms are now official MOH HMIS documents. Information is used for procurement and distribution delivery.

The MOH system is reaching 40 percent more health facilities than in 2001; the value of commodities supplied has increased more than four-fold.

Table 1. Improved Logistics Systems Results (2001–2006)

Logistics Activity	Status October 2001	Status August 2006	Notes and Comments
Commodity: Essential Drugs			
1. Basic Essential Drugs Distribution System	<ul style="list-style-type: none"> • Push system • 3-month cycle • Drugs used up early in cycle • Some drugs not appropriate 	<ul style="list-style-type: none"> • Pull system • Local choice of which drugs to request from credit line • 2-month cycle • Drugs still in short supply because of funding shortfalls 	<ul style="list-style-type: none"> • Major shift in focus with essential drugs (ED) credit line started in Jan. 2003. • Now, 84% of facilities select which drugs they want. • At least 58% of facilities claim improvement in logistics system.
2. Number of MOH health facilities	<ul style="list-style-type: none"> • Approximately 1,370 	<ul style="list-style-type: none"> • Approximately 1,979 • (from 2004 MOH inventory) 	<ul style="list-style-type: none"> • A 45% increase in MOH facilities receiving MOH drugs.
3. Number of faith-based organizations (FBO) and NGO facilities supplied with MOH drugs	<ul style="list-style-type: none"> • None: separate systems 	<ul style="list-style-type: none"> • 20% of MOH essential drugs now go to FBO and NGO hospitals • 607 sites in total 	<ul style="list-style-type: none"> • Major policy change by MOH to support NGOs/FBOs with free government drugs.
4. Number of key essential drugs on HMIS order form	<ul style="list-style-type: none"> • 26 drugs, with others on request in 2003 	<ul style="list-style-type: none"> • 96 drugs, with others on request 	<ul style="list-style-type: none"> • Pull system worked so well, it increased the demand for additional key products.

Logistics Activity	Status October 2001	Status August 2006	Notes and Comments
Commodity: Contraceptives			
1. Distribution system	<ul style="list-style-type: none"> • Completely ad hoc, from closets, Mulago Hospital, offices, etc. • Districts responsible to acquire 	<ul style="list-style-type: none"> • Integrated into ED credit line with ordering and delivery every two months by the National Medical Stores (NMS) 	<ul style="list-style-type: none"> • Major change in family planning supply distribution Still not perfect, but major improvement.
Commodity: Condoms			
1. Condom distribution system	<ul style="list-style-type: none"> • Ad hoc distribution from various MOH offices 	<ul style="list-style-type: none"> • Integration into ED credit line • Distribution by NMS 	<ul style="list-style-type: none"> • Normalized distribution process. • New district distribution system starting up in 2006.
2. Condom policy and distribution design	<ul style="list-style-type: none"> • Out of date condom policy • No planned distribution system 	<ul style="list-style-type: none"> • Revised condom policy leads to formal distribution guidelines • Distribution design expanded to include new district key sites 	<ul style="list-style-type: none"> • New policy now referred to as guidelines. • New distribution design for districts approved with funding planned in GFATM budgets.
3. Condom quality control	<ul style="list-style-type: none"> • External inspection, NDA document verification 	<ul style="list-style-type: none"> • External inspection, NDA post-shipment testing begun locally 	<ul style="list-style-type: none"> • Quality control issues caused major MOH supply disruptions for 1.5 years.
Commodity: Tuberculosis Drugs			
1. Distribution system	<ul style="list-style-type: none"> • TB program distributes drugs based on patient numbers • No possibility of tracking supplies 	<ul style="list-style-type: none"> • TB program distributes drugs based on logistics data • TB program tracks commodities to all levels 	<ul style="list-style-type: none"> • Completely changed TB supply system to use logistics data. • At least 1,300 TB staff trained in 2005. • Improvements in wastage rates expected.
2. Number of patients on treatment	<ul style="list-style-type: none"> • 37,600 per year 	<ul style="list-style-type: none"> • 41,809 per year 	<ul style="list-style-type: none"> • Significant expansion of patients on TB treatment.
3. TB/HIV AIDS co-treatment	<ul style="list-style-type: none"> • Not considered 	<ul style="list-style-type: none"> • New co-treatment policy 2005 • Logistics adjustments in process 	<ul style="list-style-type: none"> • New policy requires improved logistics coordination across programs.
4. TB Laboratory supplies	<ul style="list-style-type: none"> • Ad hoc ordering and distribution to labs 	<ul style="list-style-type: none"> • Integration into new laboratory reagents credit line • Distribution by NMS with other laboratory supplies 	<ul style="list-style-type: none"> • Integration into NMS/JMS will eliminate separate NTLP distribution and regularize system.
Commodity: Vaccines			
1. Distribution system	<ul style="list-style-type: none"> • Vertical Uganda National Expanded Program for Immunization (UNEPI) distribution because of cold chain • Cold chain requirements complicate logistics planning 	<ul style="list-style-type: none"> • Still vertical UNEPI distribution 	<ul style="list-style-type: none"> • UNEPI distributes to 2,130 immunization outlets.

Logistics Activity	Status October 2001	Status August 2006	Notes and Comments
2. Value of vaccines per year	<ul style="list-style-type: none"> • \$2.36 million per year 	<ul style="list-style-type: none"> • \$17.7 million per year with addition of pentavalent vaccines 	<ul style="list-style-type: none"> • Global Alliance for Vaccines and Immunization (GAVI) subsidy for 5 years, most likely will be extended.
3. Mass immunization campaigns	<ul style="list-style-type: none"> • Unknown 	<ul style="list-style-type: none"> • 15 million measles in 2005 • National polio in 2006 	<ul style="list-style-type: none"> • Requires substantial investment and intensive logistics planning.
4. Warehousing situation	<ul style="list-style-type: none"> • Overcrowded, badly organized warehouse 	<ul style="list-style-type: none"> • Dejunking exercise increased space • Study recommended new and expanded warehouse 	<ul style="list-style-type: none"> • Dejunking in final stages. • New warehouse plans and budgets approved by Ministry of Finance and underway.
5. Vaccine forecasting	<ul style="list-style-type: none"> • Based on population projections 	<ul style="list-style-type: none"> • Shift to commodity based forecasting and delivery in 5-year UNEPI Strategic Plan 	<ul style="list-style-type: none"> • Will reduce wastage rates of expensive vaccines. • Shift from 20-dose vial to 2-dose vial Reduces wastage.
Commodity: Laboratory Supplies			
1. Distribution System	<ul style="list-style-type: none"> • None, ad hoc district purchase from JMS or locally, with PHC funds 	<ul style="list-style-type: none"> • Formalized laboratory credit line pull system with funds just for laboratory reagents and consumables 	<ul style="list-style-type: none"> • Distribution started April/May 2006.
2. Number of labs receiving MOH supplies	<ul style="list-style-type: none"> • Unknown, low number, low value 	<ul style="list-style-type: none"> • 960 MOH and NGO labs at district, Health Center (HC) IV, HC III levels, all sites with laboratory technician 	<ul style="list-style-type: none"> • Trained laboratory technician in place is a requirement.
3. Lab system information	<ul style="list-style-type: none"> • No central information 	<ul style="list-style-type: none"> • National assessment of every MOH & NGO laboratory with a technician done in 2005 	<ul style="list-style-type: none"> • Assessment guided supply and equipment procurement & new training requirements. • DELIVER, MOH, CDC conducted joint study.
4. Joint Clinical Research Center (JCRC) laboratory centers	<ul style="list-style-type: none"> • JCRC central laboratory only 	<ul style="list-style-type: none"> • 6 regional centers planned • Logistics system designed and staff recruited by JCRC 	<ul style="list-style-type: none"> • Two existing, 2 new regional centers opening soon.
5. National Institutes of Health (NIH) Rakai laboratory supply system	<ul style="list-style-type: none"> • Ad hoc planning and inventory control in 2005 	<ul style="list-style-type: none"> • System designed and in place with forms, computer data, and monitoring 	<ul style="list-style-type: none"> • System begun in March 2006 at NIH/USAID request.
Commodity: Injection Safety			
1. Adoption of auto-disabled (AD) syringe	<ul style="list-style-type: none"> • No policy, only UUNEPI and reproductive health • RH used AD syringes 	<ul style="list-style-type: none"> • Policy for only AD syringes underway. • Logistics input for smooth transition. • July 2007 will be last non-AD syringe import 	<ul style="list-style-type: none"> • Major policy shift. • Only AD syringes in MOH and private sector use. • Purpose is reduced HIV transmission.
2. AD syringe availability	<ul style="list-style-type: none"> • Only UNEPI and USAID RH 	<ul style="list-style-type: none"> • Presently available nationally, but transition not yet complete 	

Logistics Activity	Status October 2001	Status August 2006	Notes and Comments
3. Waste management and injection safety policy	<ul style="list-style-type: none"> Worst performing activity in MOH/DELIVER 2002 Uganda Health Facility Survey 	<ul style="list-style-type: none"> National committee in place Incinerators now in most districts MOH funding & attention 	<ul style="list-style-type: none"> Still much to be done. Incinerators, safety boxes, AD syringes, reverse logistics needed.
Commodity: ARV Drugs			
1. Distribution system for MOH	<ul style="list-style-type: none"> No MOH ARV distribution until 2004 	<ul style="list-style-type: none"> Through NMS, 4-week ordering Monthly delivery, with 1 month buffer on site One year in system design Drugs ordered for exact number of patients 	<ul style="list-style-type: none"> System operating effectively and coping with rapid expansion.
2. Total number of MOH patients	<ul style="list-style-type: none"> June 2004: none December 2004: 2,225 	<ul style="list-style-type: none"> Sept. 2006: 34,910 MOH patients 	<ul style="list-style-type: none"> Major expansion in MOH coverage, one of best in world.
3. Total number of patients from all sources	<ul style="list-style-type: none"> Approximately 10,000 	<ul style="list-style-type: none"> Approximately 80,000 patients 	<ul style="list-style-type: none"> Only country to reach WHO target coverage in first year.
4. Total number of MOH access sites	<ul style="list-style-type: none"> Start June 2004: 26 sites 	<ul style="list-style-type: none"> June 2006: 220 active MOH sites 	<ul style="list-style-type: none"> Expansion target for 2007 is 300 sites, to HC IV level.
Commodity: HIV Test Kits			
1. PMTCT distribution system	<ul style="list-style-type: none"> Separate system Ad hoc from MOH offices 	<ul style="list-style-type: none"> Integrated into NMS/JMS ED delivery system for bi-monthly delivery 	<ul style="list-style-type: none"> With Abbott donation of Determine kits for PMTCT, supplementary supplies needed.
2. PMTCT number of sites	<ul style="list-style-type: none"> Approximately 8 sites 	<ul style="list-style-type: none"> Approximately 400 	<ul style="list-style-type: none"> Significant increase in site availability
3. Voluntary counseling and testing (VCT) distribution system	<ul style="list-style-type: none"> Separate system Ad hoc distribution 	<ul style="list-style-type: none"> Integrated into NMS/JMS ED system every 2 months 	<ul style="list-style-type: none"> Integrated ordering and reporting with PMTCT to AIDS Control Program (ACP).
4. Patients tested for VCT/PMTCT	<ul style="list-style-type: none"> 30,000 approximately 	<ul style="list-style-type: none"> 1,200,000 in 2005/2006 year 	<ul style="list-style-type: none"> Combined VCT & PMTCT testing went from 30,000 a year to 1,000,000 plus a year (in spite of recent 6-month national level stockout).
5. Number of VCT access sites	<ul style="list-style-type: none"> 8 nationwide 	<ul style="list-style-type: none"> 460 nationwide 	<ul style="list-style-type: none"> Significant expansion of testing sites, supported by logistics systems.
6. VCT/PMTCT policy	<ul style="list-style-type: none"> No written policy, just practice 	<ul style="list-style-type: none"> PMTCT policy VCT policy VCT to routine counseling and testing (RCT) policy Change test protocols in response to technical and cost analysis 	<ul style="list-style-type: none"> At least two changes to testing regime accomplished smoothly.

Logistics Activity	Status October 2001	Status August 2006	Notes and Comments
7. HIV testing logistics training	<ul style="list-style-type: none"> No previous training 	<ul style="list-style-type: none"> 1,300 people trained in test kit ordering 	
Commodity: Nevirapine for PMTCT			
1. Number of patients	<ul style="list-style-type: none"> Unknown, but very limited 	<ul style="list-style-type: none"> 10,332 patients in 2005 	<ul style="list-style-type: none"> Substantial expansion made.
2. Distribution system	<ul style="list-style-type: none"> Ad hoc, limited reach 	<ul style="list-style-type: none"> Integrated with MOH NMS drug distribution 	<ul style="list-style-type: none"> Abbott donation caused difficult reporting requirements.
Commodity: Joint Clinical Research Center ARVs			
1. Number of patients	<ul style="list-style-type: none"> Approximately 10,000 	<ul style="list-style-type: none"> Approximately 38,000 patients on any ART treatment June 2006 	<ul style="list-style-type: none"> Major expansion of patient numbers.
2. Number of JCRC ARV sites	<ul style="list-style-type: none"> Central facility Kampala 	<ul style="list-style-type: none"> June 2006, 38 sites countrywide 	<ul style="list-style-type: none"> Some combined sites with MOH.
3. JCRC distribution system	<ul style="list-style-type: none"> Only central site 	<ul style="list-style-type: none"> Regular 2 monthly supply to 38 sites 	<ul style="list-style-type: none"> DELIVER assisted with logistics system design and training.
4. JCRC labs	<ul style="list-style-type: none"> Central lab only 	<ul style="list-style-type: none"> 6 <i>Centers of Excellence</i> sites planned, 4 are operational 	<ul style="list-style-type: none"> DELIVER assisted with laboratory logistics design.
5. Procurement	<ul style="list-style-type: none"> Ad hoc but effective for central site 	<ul style="list-style-type: none"> With expansion, procurement and tracking had to become more formalized 	<ul style="list-style-type: none"> DELIVER assisted JCRC on logistics, working within their system.
Commodity: NGO ARVs			
1. NGO ARV distribution	<ul style="list-style-type: none"> Limited NGO ART 	<ul style="list-style-type: none"> 9–10 PEPFAR supported NGOs now providing ART 6–8 non-PEPFAR NGOs Interreligious Council of Uganda (IRCU) quantification done 	<ul style="list-style-type: none"> Distribution forms, pipeline tracking, and forecasting systems offered to all NGOs; many have individual systems.
System Development: PipeLine Software for Tracking Procurement Shipments			
1. Use of DELIVER-developed computer software	<ul style="list-style-type: none"> Not applicable 	<ul style="list-style-type: none"> 226 key MOH products tracked through DELIVER PipeLine system software 	<ul style="list-style-type: none"> 95 essential drugs—NMS 66 lab supplies—CPHL Contraceptives—RH Condoms—ACP ARVs—ACP Test kits—ACP JCRC ARVs—JCRC SM contraceptives—AFFORD
System Development: Computerized LMIS System Development			

Logistics Activity	Status October 2001	Status August 2006	Notes and Comments
1. LMIS adjusted for specific MOH program needs	<ul style="list-style-type: none"> No LMIS systems before 	<ul style="list-style-type: none"> First national MOH facility list LMIS at MOH Resource Center & individual programs LMIS systems operating for ARVs, test kits, TB drugs, lab supplies 	<ul style="list-style-type: none"> DELIVER assisted MOH Resource Center with technical support, a system firewall, and first-ever data backup. Coordinated with other HMIS system design for compatibility.
<i>System Development: Logistics Involvement in Policy Determination</i>			
1. Logistics inputs in health policy	<ul style="list-style-type: none"> No formalized logistics consideration 	<p>Logistics played an active role in the following policy design</p> <ul style="list-style-type: none"> Push-pull ED decision ARV regime choice HIV test kit algorithm Cotrim prophylaxis Laboratory test standards CD4 machine choices Use of AD syringes Malaria treatment change Condom distribution Contraceptive choices TB blister packs Sustainability of pentavalent vaccines Vaccine costs Pediatric AIDS treatment 	<ul style="list-style-type: none"> DELIVER project goal has been to increase the importance and inputs from the logistics perspective. To prevent future problems, we have demonstrated the importance of including logistics at the table in original policy decisions. This list documents instances where logistics considerations helped determine policy and procurement selection for the MOH.
<i>System Development: Logistics Visibility</i>			
1. In strategic plans	<ul style="list-style-type: none"> No logistics considerations in national plans 	<p>Logistics has prominent consideration in the following formal plans:</p> <ul style="list-style-type: none"> HSSP II AIDS Control Program Uganda AIDS Commission UNEPI 5-year plan Laboratory revitalization 	<ul style="list-style-type: none"> Logistics is now a formal part of national program plans.
<i>System Development: National Medical Stores Capacity and Efficiency</i>			
1. Improved distribution efficiency	<ul style="list-style-type: none"> NMS managed MOH distribution push system 	<ul style="list-style-type: none"> Changed from pass through to packing for almost 2,000 individual health facilities every two months 	<ul style="list-style-type: none"> Tremendous strategic change implemented well.
		<ul style="list-style-type: none"> Used technical assistance to redesign warehouse to improve order filling speed 	<ul style="list-style-type: none"> NMS implemented suggestions immediately.

Logistics Activity	Status October 2001	Status August 2006	Notes and Comments
		<ul style="list-style-type: none"> • Reduced inventory products from 3,000 to less than 600 	<ul style="list-style-type: none"> • Simplified warehouse inventory control & management.
		<ul style="list-style-type: none"> • Installed PipeLine to guide procurement for 96 products 	<ul style="list-style-type: none"> • PipeLine simplified future procurement planning.
		<ul style="list-style-type: none"> • NMS standardized memorandum of understanding (MOU) for all donated 3rd party products 	<ul style="list-style-type: none"> • DELIVER provided logistics suggestions for NMS MOU.
2. Rationalizing NMS cost structure	<ul style="list-style-type: none"> • Ad hoc 3rd party costs 	<ul style="list-style-type: none"> • Standardized 10% fee • Requested DELIVER & DANIDA cost analysis • Standardizing 3rd party costs 	<ul style="list-style-type: none"> • Costs recovery is a key to NMS commercial viability and a future target.
3. Committed to barcoding	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • NMS and DELIVER agreed to barcoding to improve order efficiency 	<ul style="list-style-type: none"> • NMS decided to wait for installation and debugging of new Navision 4.0 system. • Barcoding package included.
4. Upgrading Computer and wiring system	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • Moved to Navision 3.0, then 3.6, and soon to 4.0 • Replaced wiring to fiber optics system to speed up data processing • Barcoding in Navision 4.0 	

System Development: Logistics Surveys & Studies

1. Surveys & studies	<ul style="list-style-type: none"> • 2000 contraceptive procurement table (CPT) logistics assessment 	<p>The following studies were completed:</p> <ul style="list-style-type: none"> • Health Facility Survey 2002 • Health Facility Survey 2006 • National lab survey 2004 • CD4 equipment survey • Procurement issues—2003 • JCRC lab logistics—2005 • Laboratory standard guidelines—2004 • 46-plus technical assistance reports • Logistics System Assessment Tool (LSAT) contraceptive surveys 2002, 2003, 2006 	<ul style="list-style-type: none"> • These surveys and studies helped guide national policy and specific commodity decisions.
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System Development: Logistics Coordination

Logistics Activity	Status October 2001	Status August 2006	Notes and Comments
1. Coordination activities	<ul style="list-style-type: none"> • Very little to none 	Coordination among— <ul style="list-style-type: none"> • 10 MOH sections • 14 USAID-sponsored NGOs • 26 other NGOs • ARV Technical Committee • National Lab Tech. Comm. • National Injection Safety • District level activities with <ul style="list-style-type: none"> - AIM - UPHOLD - EGPAF - UNFPA - QAP • Harmonization exercise • CPT donor coordination 	<ul style="list-style-type: none"> • Listed in appendix.

ELEMENT II: IMPROVED HUMAN CAPACITY IN LOGISTICS

As logistics systems were developed and expanded, the staff needed to be trained in the new ordering and distribution processes. Separate national training programs were completed for essential drugs and contraceptives, condom distribution, ARV provision, HIV test kit provision, TB drugs, and laboratory reagents and consumables. The number of people trained and other capacity building details are provided below.

With each system, corresponding manuals and training curriculums were developed and people were trained within each program. Computer systems were adapted for each program and people were trained in their use.

Support supervision materials were created for each program, but with the lack of funds and political will, this supervision is often the most difficult aspect of maintaining a system. During our final end line review, we also identified that regular retraining is necessary, because personnel frequently move within the MOH.

Table 2. Improved Human Capacity Results (2001–2006)

Logistics Activity	Status October 2001	Status August 2006	Notes and Comments
1. National level detailed training	None done previously	The following staff received detailed 3-week logistics training <ul style="list-style-type: none"> • Pharmacy section—all 3 staff • ACP section—3 staff • VCT, PMTCT, condoms • NMS—operation director • JCRC logistics officer 	Excellent detailed course on logistics fundamentals.

Logistics Activity	Status October 2001	Status August 2006	Notes and Comments
		<ul style="list-style-type: none"> • DELIVER staff—5 advisors 	
2. Training on essential drugs & family planning ordering	None	2002—250 health sub-district (HSD) staff 2005—3,332 from 1,800 MOH facilities 2005—442 NGO staff	Training in ordering and forecasting was completed for every facility in the entire country in 2005.
3. Laboratory system training	None	2005—958 staff from 873 labs	Training was done prior to starting the laboratory pull system.
4. ARV logistics training	None	814 staff trained 220 MOH facilities 85 non-MOH facilities 38 JCRC sites 38 trained in ART logistics supervision	Logistics training is required before a facility can received MOH ARVs.
5. HIV test kit training	Very limited	1,542 staff trained 1,017 MOH facilities	
6. TB training	None, central decisions	1,301 staff trained	Training at start of TB pull system.
7. MOH LMIS systems	None existed	30 staff trained within programs and in the Resource Center	
8. Forms designed and institutionalized	No logistics forms HMIS forms in use	<ul style="list-style-type: none"> • Essential drugs order form is HMIS 018 • Lab supplies order HMIS 018B • ARV forms—5 forms • Test kits forms • TB drug use forms • Lab services summary form • Training manuals for above forms • ARV supervision checklist 	
9. New logistics staff in place	No logistics staff	The following programs have added logistics staff from their own funds <ul style="list-style-type: none"> • NTLP program • JCRC—3 logisticians • NMS ARV logistician • NMS laboratory supplies staff • IRCU ARV logistician 	DELIVER has assisted with the job descriptions and recruitment and training of these logistics staff.

ELEMENT III: IMPROVED RESOURCE MOBILIZATION

One of the recurring problems in Uganda is the lack of funds to adequately support needed drugs at all levels. Only a few products—TB drugs, contraceptives, and condoms—are in full supply. ARV drugs are

in full supply for only a small subset of the total need. For essential drugs, in spite of the four-fold increase in the value of drugs distributed, less than half the money needed for the basic minimum care package is available. This means that most drugs will always be stocked out because of insufficient funds.

Uganda receives more than half its total drug budget from third party procured and donated drugs. Harmonization and coordination for this varied supply input was a large part of DELIVER's assistance to the MOH.

DELIVER was actively involved with generating additional money for the procurement of medical supplies for Uganda. In addition to requiring reasonable supply systems, the actual amount of drugs going through the system is dependent on generating additional funds. DELIVER assisted the MOH in successful proposals for more than U.S.\$240 million in GFATM funding, with more than half of that for drug procurement (and some for drug distribution.). DELIVER also assisted with emergency procurement when normal systems failed. This is detailed below.

DELIVER worked with the USG PEPFAR and PMI drug quantification and assisted other NGO groups to secure funding for drugs and medical supplies from other sources. With logistics systems that could track where the final destination of the donor products, donors were often more willing to commit commodity funds because they could reliably show that their contributions were used.

The five-year comparisons listed in table 3 show that we were able achieve our objective to help the MOH and NGOs in Uganda negotiate substantial additional commodity funds, and that these commodities could be tracked to the end users for government and donor accountability.

Table 3. Improved Resource Mobilization Results (2001–2006)

Logistics Activity	Status October 2001	Status August 2006	Notes and Comments
1. Value of drugs and medical supplies per person in MOH system	\$0.88 per person ¹	\$4.06 per person	Just for drugs and medical supplies, MOH and donor input has increased 4.5 times.
2. Value of third party drugs and commodities in MOH system	\$.038 per person per year	\$3.03 per person per year	Third party drug value has increased more than 8 times from GFATM, PEPFAR, GAVI, others—all through NMS/JMS.
3. Total value of drugs in MOH system	\$18.7 million per year	\$84 million per year	A 4.5 times increase in value, from HSSP documents.
4. Total Value of contraceptive products in MOH system	\$2,264,138 per year	\$2,732,720 per year	A 20% increase in contraceptive supplies, not including condoms.
5. MOH commitment to family planning procurement	none	Specified MOH budget line item last 3 years	USAID, UNFPA, & MOH major buyers.
6. Contraceptive Procurement Tables	Done by external assistance with MOH	Done by MOH with in-country DELIVER technical assistance	Formal annual meeting uses CPTs to plan family planning procurement.
7. Total MOH condoms per year	Approximately 35 million	Approximately 80 million	Target 100 million MOH condoms for 2006/2007.
8. Total socially marketed condoms per year	Approximately 25 million per year—2 agencies	Approximately 35 million per year—3 agencies	Both MOH and social marketing demand has increased by 90% in 5 years.

¹ All dollar amounts in this table are U.S. dollars.

Logistics Activity	Status October 2001	Status August 2006	Notes and Comments
9. Value of TB drugs	\$1,461,830 per year	\$ 3,225,084 per year	A 120% increase in value.
10. Lab Supply value	Unknown—very low	In FY2006/2007, \$2 million plus	Will add other laboratory inputs, TB testing, & malaria test kits.
11. CD4 machines and reagents	None	26 in country, additional 26 planned harmonization and strategic placement underway	Placement for equitable access in process through Central Public Health Lab.
12. Value of ARV drugs through MOH system	zero	\$16 million—2006/2007 \$31 million—planned 2007/2008	Reliance on GFATM funding for MOH drugs. Major cost reductions in 3 years.
13. Prophylactic distribution	Not AIDS prevention policy	Policy change Distribution with ED NMS Large scale distribution starting June 2006	\$1.6 million cotrimoxazole from PEPFAR for NMS/JMS system.
14. Expanding funding sources and increasing drug supply	Limited external financing No records available	DELIVER assisted with the following: <ul style="list-style-type: none"> • GFATM Round 1—\$96 million • GFATM Round III—\$154 million • Multisectoral AIDS program (MAP)/ World Bank (WB) condoms \$2.4 million • PEPFAR labs, kits, cotrimoxazole—\$5 million 	DELIVER provided logistics planning and technical quantification to MOH, which helped receive approval for large amounts of commodity funding. Commodity funding 50% of total approved MOH budgets.
15. Successful emergency procurement	Not applicable	<ul style="list-style-type: none"> • Blood bags \$ 0.3 million • Malaria drugs \$1.2 million • HIV test kits \$3.2 million • Condoms \$2.4 million • ARV 2nd line drugs \$0.8 million 	DELIVER assisted/organized gap filling procurements.
16. Procurement issues study	None	Identified stockout problems with dependency on donor procurement	The 2003 study recommended harmonization and coordination exercise.
17. Coordination within programs	N/A	Done for ARVs, tests, TB, labs, condoms, and contraceptives	Coordination of commodities continues to be a key problem area.
18. Harmonization database	N/A	Harmonization and rationalization exercise begun by Pharmacy section in response to Health Sector Review donor request	DELIVER supported donor and MOH data collection in first round exercise.

LESSONS LEARNED AND FUTURE DIRECTIONS

LESSONS LEARNED

During the five years, from October 2001 to September 2006, the DELIVER project, with USAID funding and support, participated in the creation, design, and implementation of a wide range of logistics systems that covered almost all MOH and NGO public-sector commodities. During this time, a many lessons have been learned, and the DELIVER logistics technical staff have gained invaluable hands-on experience. This section makes a distinction between strategic lessons learned, applicable to a broader logistics approach, and specific lessons learned, which are focused on more narrowly defined areas. There are overlaps in the two types, but these distinctions should still allow others to use these lessons learned appropriately. This report concludes with a few comments on future directions that will need to be addressed as additional support for logistics activities advances to the next stage.

STRATEGIC LESSONS LEARNED

1. Logistics systems require constant adjustment. This statement is obvious, but it is worth reinforcing—the systems are not static. A constantly changing panorama of products, policies, technologies and people, adjustments, and improvements to the systems are needed all the time. And, commodity emergencies are a constant threat to system efficiency and need immediate attention.
2. Full logistics system development takes 12 to 18 months. From general experience, it takes more than one year from the concept, through to the system design, creation and testing of forms, training of personnel, and refinements to the system. By allowing necessary stakeholder involvement and buy-in, this period is an important investment in the birth of a new program. This timeframe was applicable to the development of the ARV system, test kit system, TB system change, and new laboratory supply system.
3. The most substantial threat to the provision of commodities in Uganda was third-party procurement failures. When committed supplies did not arrive or were eight months late, there were major commodity failures. This problem occurred with condoms, TB drugs, test kits, and other products. Improved communication and planning is needed, as well as a mechanism to deal with emergency procurement needs.
4. Upstream logistics planning should be a future focus of attention. Increasingly, especially in an environment of restricted product production, it is important to be aware of production bottlenecks or failures, of customs clearance processes, and of government regulatory requirements. All of these will adversely affect product availability.
5. Logistics issues should be an important part of policy development. DELIVER found that while making policy decisions it was important to include logistics considerations from the very beginning. Refrigeration questions, pricing issues, volume requirements, and other considerations need to be factored into policy and product choices. In fact, we found that the need for clarity in the logistics design often forced policy finalization, because basic product selection decisions could not be made without clear technical choices. An example of this was the need for national decisions on parallel or serial protocol for HIV testing before quantification and ordering could be done.

6. A focal point for logistics activities and commodity information is important. DELIVER provided this necessary focus for logistics activities, although it could be done by other groups. Improved information sharing across programs, between donors, and between donors and the government was done by DELIVER, and it definitely improved overall system efficiency and efficacy.

SPECIFIC LESSONS LEARNED

1. Train two–three people per site in correct logistics ordering. Health staff move frequently, so it is worth the investment to train more than one person. For example, three people needed to be trained in ARV ordering per site.
2. Smaller delivery sizes of bottles, packets, or boxes, though more expensive to produce, saved money in the long run. A 1,000 unit bottle of TB pills was not helpful when a specific site only needed 200 pills a year. Nevirapine syrup and 20-dose vaccine vials would have been more useful and economical in small units. Repacking is not economically or logistically feasible.
3. Simplification and understanding of national customs or regulatory requirements by senior program managers could have saved program money. There were too many instances of customs clearance delays or products being rejected at the national level because they did not meet internal regulatory requirements. With a small investment before problems arise, extra costs can be avoided and products can be made available for distribution more quickly.
4. Procurement decisions are often made for reasons other than for the most efficient health benefits or most effective logistics needs.
5. Logistics requirements often require involvement in unexpectedly small details to make a system work efficiently. If these issues are not addressed, then a larger objective may not work effectively. An example of this in the design of the laboratory reagents logistics system was the search for large quantities of distilled water. The distilled water was needed to save money by locally reconstituting laboratory reagents for the laboratory pull system. Importation of distilled water was prohibitively expensive.
6. Issues other than non-supply often influence contraceptive product availability. For example, some district officers would not order contraceptives because of their own religious objections. Certain warehouses would not distribute contraceptives to their clients because of philosophical differences.
7. Continuous advocacy and policy support and minor technical and financial support over several years can lead to major policy changes, as we saw with both condoms and with auto-disable syringes.
8. The pull system for essential drugs and contraceptives was judged more efficient, reduced waste, and gave local staff a greater sense of control than the old push system. This was reflected both in the final logistics survey response from field staff and in field observation.
9. In this new logistics environment of higher costs and more commodities, donors must be persuaded to make smaller, more frequent shipments. Warehouses can no longer afford to store one year of commodity supplies.
10. With the high cost of pentavalent vaccines, high wastage rates are no longer acceptable under the vaccination program, so vaccine logistics systems need to be more precise and based on actual stock demand, not theoretical patient demand.
11. As treatment policies evolve and become more sophisticated over time, logistics systems must adjust to policy refinements. Examples of commodity needs and availability requirements changing include new product quantities as step-up first line ARV treatment was introduced, new products in different

places as the ARV policy for pregnant women evolved, and vastly increased test kit quantities as voluntary counseling and testing became routine counseling and testing.

12. IT system design takes 2–3 times longer to make operational than projected. Examples include the Navision system introduction at NMS, barcoding coordination and refinement of the Supply Chain Manager computer system.
13. A functioning logistics system, with reasonably accurate end-user data, seems to encourage additional donor funding, because the end result of commodity funding can be tracked and verified.
14. Resident logistics advisors, able to answer questions and help programs deal with emergencies, are most effective in providing non-specialized logistics support.
15. The change in the delivery system from national-level to facility-level ordering and packing worked, eliminating district warehouses and district storage except for transient storage.

FUTURE DIRECTIONS

As coverage of specific commodities increases; as policies are improved to provide more individualized treatment, particularly for ART; as programs are integrated to improve coverage and treatment options; and as patient numbers expand, logistics supply lines have to be increasingly flexible, and increasingly precise and strengthened to cater to the expansion of delivery of health services. All these requirements put pressure on warehouse and delivery systems, product tracking, and information systems.

For example, all the following will demand major adjustments to MOH commodity delivery systems in the next few years:

- MOH ARV expansion to 56,000 patients by the end of 2008
- accredited ARV sites expanding from 220 to over 300 by the end of 2007
- routine counseling and testing (RCT) policy changes could triple HIV test kit demand to three million a year.

Much more remains to be done and to respond effectively to the adjustments above, some of the following changes to commodity delivery systems are foreseen;

- PMTCT policy adjustments will require access to ARV drugs for pregnant women before delivery, which will require a totally new delivery system.
- TB and HIV integration will require cross-system product delivery.
- TB and rapid malaria testing supplies must be added to the laboratory credit line system.
- Retraining and support supervision is needed for all levels of the MOH systems as staff transfer and new facilities are opened.
- To cater to the expansion in the number of districts and in the number of health service delivery points, the current UNEPI logistics systems will need to be reviewed and redesigned.
- National Medical Stores will need new warehouse operating systems and procedures to cope with a doubling of commodity volume through the warehouse.
- Malaria policy changes in Coartem treatment, bed net distribution, and indoor residual spraying will require new logistics approaches.

Commodity harmonization across donor and MOH programs will need to be improved to reduce overlapping, wastage, and inefficient procurement. The MOH is extremely dependent on third-party procurement and when this procurement fails or is delayed, the result is major product stockouts. This needs to be addressed, emergency options need to be in place, and a team dedicated to reacting rapidly to commodity emergencies needs to be empowered.

Some service provision challenges are not just logistical, but cut across other operational areas. For example, the MOH plans to rapidly expand HIV care and treatment services—especially ART—will potentially present challenges in the expansion of trained human resources or personnel, e.g., clinical and laboratory specialists, to provide these services.

As PEPFAR treatment expands to an ever-increasing number of organizations and sites, these PEPFAR-supported NGOs and FBOs will need more reliable, flexible, and accountable logistics systems to meet higher patient demands and more intensive USAID reporting requirements. Procurement systems across the PEPFAR-supported spectrum will need to be harmonized to provide the best treatment at the best cost.

Logistics systems have been designed, and are in place and working; record keeping forms have been created and institutionalized within the MOH and NGOs; computer LMIS systems are in place; people have been trained in logistics ordering and forecasting; and logistics data systems have been created and are working. But, with product demand doubling every few years, new treatment policies requiring more sophisticated delivery and tracking systems, limited government budgets and unanticipated emergency threats to product availability, logistics technical support will be needed for the foreseeable future. Specifically, five areas will need attention in the coming years:

1. To make systems more effective and more efficient with continuing patient expansion and new treatment policies that require more complex product provision, the harmonization of procurement and cross-program coordination will need to be improved.
2. Improved operational management of both the National Medical Stores and the Joint Medical Stores will be required to deal with the expanding volume, short product shelf-life, and wider variety of health commodities within those warehouse systems.
3. New malarial policy decisions focusing on Coartem treatment, long lasting insecticidal nets bed net distribution, and indoor residual spraying (IRS) will require new logistics approaches and system adjustments.
4. For logistics systems to succeed in the long run, training and support supervision will require additional emphasis.
5. To ensure consistent logistics messages and approaches and long-term integration, coordination across logistics programs will be needed.

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The following documents are internal to the projects and are not available.

- Global Fund Proposals: Round I, III, IV, VI. Ministry of Health 2003, 2004, 2006.
- Health Sector Strategic Plan: HSSP II, 2005/06-2010/11. Ministry of Health. 2006.
- PEPFAR Strategic Plans: Uganda. USAID. 2003, 2004, 2005, 2006, 2007.
- President's Malaria Initiative: Uganda USAID: Country Action Plan.
- Uganda Malaria Control Strategic Plan 2005/06 - 2009/10. Malaria Control Program, Ministry of Health.
- UNEPI Strategic Plan 2006-2011. Ministry of Health. 2006.

APPENDIX 1

COUNTRY FACT SHEET

Country: Uganda

Total Funding: \$9,402,434

DELIVER Field Office

No. of local staff: 23

Presence established in 2001

Technical Focus Areas	Family planning	x	TB	x	Donor coordination	x
	Integrated systems	x	Contraceptive security	x	Market segmentation	
	Financing	x	Expanded Program on Immunization (EPI)	x		
	HIV/AIDS	x	Essential drugs	x		
Principal Client Organizations	Ministry of Health and health sector NGOs National Medical Stores, Joint Medical Stores, Joint Clinical Research Council					
DELIVER's objectives	<ul style="list-style-type: none"> • Establish effective logistics systems for expanded distribution of HIV/AIDS commodities. • Establish effective logistics system for distribution of HIV tests, laboratory reagents, and consumables. • Establish effective logistics system for distribution of TB drugs. • Establish effective logistics system for vaccines and related EPI commodities. • Improve logistics system for essential drugs and contraceptives. • Improve warehouse management and distribution in NMS. • Improve use of information technology to support management of logistics information. • Improve capacity in MOH to monitor and manage health logistics system. • Assist MOH to increase drug financing and drug availability. 					
Major interventions	<ul style="list-style-type: none"> • Policy inputs in logistics to change essential drug system to a <i>pull</i> demand system and to create working logistics systems for ARVs, HIV test kits, TB drugs, and laboratory supplies. • Assisted MOH in quantification and in successful financial support proposals for ARVs, HIV test kits, vaccines, contraceptives, TB drugs, and laboratory reagents and consumables. • Designed, tested, and helped implement logistics forms for ARVs, test kits, essential drugs, TB drug, vaccine, contraceptives, condoms, and laboratory supplies; and set up computer programs to support these systems. • Trained all ARV providers & produced logistics management procedure manual for ARVs, nevirapine, and HIV tests. • Established laboratory supply credit line through NMS; trained laboratory staff in labs on new laboratory logistics supply system. • Trained 3,500 health workers in all MOH and NGO facilities in logistics system for essential drugs and contraceptives. 					

	<ul style="list-style-type: none"> • Trained TB program staff in 44 districts on new logistics system for TB drugs, established central logistics management information system for processing logistics data from 1,917 SDPs. • Assisted national level warehouses to improve efficiency and distribution systems.
Primary results	<ul style="list-style-type: none"> • Successful change to <i>pull</i> demand system for essential drugs and contraceptives allowed greater local control of product choices and increased product access. • Value of drug supply through MOH system increased by 4.5 times. • National Medical Stores made the transition from a “pass-through” warehouse to a unit packing individual orders for over 1,900 MOH facilities every two months. • Logistics considerations now part of MOH program planning process, based on logistics data. • MOH free ARV drugs now reaching over 30,000 patients monthly at 220 sites. • HIV tests went from 30,000 in 2001 to over 1 million in 2006 at more than 460 sites. • National system to provide laboratory supplies and reagents to all MOH and NGO labs started in 2006. • TB drug logistics system totally redesigned to use logistics data to track and distribute TB drugs. • UNEPI vaccine systems improved and national warehouse made more efficient. • Contraceptive products integrated into essential drugs system and distributed every 2 months.
Related publications	<ul style="list-style-type: none"> • Uganda: Summary of Findings of the Uganda Health Facilities Survey 2002. • Analyzing Transportation Costs • Highlights from a Pilot Assessment of the Introduction of Auto-Disable Syringes for Use with Depo-Provera in Uganda • Keeping Accountable: Developing a Logistics Information System to Monitor ARV Drugs in Uganda (presentation) • Uganda: Assessing the Costs of Distribution to Health Sub-Districts, A Case Study in Financial Analysis (presentation) • Uganda: Estimation of Commodity Requirements Needs for 2002-2003, Drugs to Treat Tuberculosis • Uganda: Estimation of Commodity Requirements for 2002-2003, Drugs to Treat Malaria • Uganda: Estimation of Commodity Requirements for 2002-2004, Drugs to Treat Sexually Transmitted Infection • Uganda: Estimation of Commodity Requirements for 2003, Drugs to Treat Opportunistic Infections • Uganda: Logistics and Procurement Decisions and Issues for Consideration for Initiating and Expanding Access to ARV Drugs • National Laboratory Assessment Survey 2004 Ministry of Health, USAID, CDC, DELIVER • National Laboratory Assessment - 2004, Ministry of Health, CDC, DELIVER, MOH • Ministry of Health: Standard Operating Procedures for Laboratory Reagent Preparation, March 2005 - DELIVER, CDC, MOH • Logistics Issues in Financing, Procurement and Distribution: 2003 DELIVER • Laboratory Equipment Assessment: Regional Laboratories : 2005 Ministry of Health, Central Public Health Laboratory, CDC, DELIVER • Uganda Health Facilities Survey 2006: Performance of HIV/AIDS and Family • Planning Commodity Logistics Systems - 2006 Ministry of Health, DELIVER • Condom Distribution Guidelines : Ministry of Health 2006 - MOH, DELIVER • Uganda Family Planning and Condom LIAT: 2006 - DELIVER

APPENDIX 2

DELIVER TECHNICAL ASSISTANCE VISITS AND REPORTS

Names	Report Title	Dates
1. Steve Wilbur Sangeeta Raja	Strategies to Improve the Logistics Systems for Drugs and Reproductive Health Supplies in Uganda: Options to Consider	Jan. 21– Feb. 1, 2001
2. Barry Chovitz	Uganda: Contraceptive Forecasts for the Years 2001-2003 and Beyond	July 22–Aug.10, 2001
3. Barry Chovitz	Draft Country Strategy and Evaluation Plan LSAT Meeting – Essential Drugs	Jan. 28–Feb. 1, 2002
4. Bernardo Uribe	CPTS and CPT procurement Plan	April 6–23, 2002
5. Yasmin Chandani Jim Eberle	Preliminary Assessment of Commodity Needs for Anti-malarial, STI & TB Drugs	April 8–24, 2002
6. Tom Brown (Crown Agents)	A Study into the Potential Use of Bar-Coding Technology to Support the NMS Stores and Logistics Operations	May 2–18, 2002
7. Niels Ulrich (K-2 Computers)	Integration of bar-coding into the NMS Navision Operating System	May 8–12, 2002
8. Yasmin Chandani (Regional Kenya)	Operational Considerations for HIV Test Kit Selection TORs for Developing National HIV Testing Guidelines	May 26–June 5, 2002
9. Yasmin Chandani	Summary Report of Preliminary Design Workshop for Transition from “Push” to “Pull” Systems for Essential Drugs & Donated Commodities	Sept. 2–18, 2002
10. Dana Aronovich Erika Ronnow Allison Cochran	Preliminary Report on the National Health Sector Logistics and HIV/AIDS Survey: 2002	May 27–June 28 2002
11. Greg Miles Steve Wilbur	DELIVER Project Country Strategic and Evaluation Plan for Uganda Sept 2002-Sept 2003	Sept. 7–13, 2002
12. Mercy Maina (DELIVER Kenya)	System Design for Uganda Commodity Database	Oct. 2–8, 2002
13. Greg Miles	Country Workplan Uganda: Finalization	Nov. 16–25, 2002

Names	Report Title	Dates
14. Y. Chandani	HIV/AIDS Quantification: On-going Quantification for MOH STI Drugs Draft ARV Discussion Guide for ARV Task Force Policy Subcommittee.	Nov. 25–Dec. 5, 2002
15. Hany Abdallah Mike Healy Tim O’Hearn	Preliminary Findings: NMS Distribution Costs Study	Nov. 25–Dec. 13, 2002
16. Y. Chandani	Logistics and Procurement Decisions and Issues for Consideration for Introducing and Expanding Access to ARVs in the Public Sector	Feb. 23–March 4, 2003 March 16–28, 2003
17. Don Douglas	Expanded Condom Distribution Plan: Preliminary Draft	March 10–28, 2003
18. Rich Owens Walter Proper	Preliminary Draft: Uganda Logistics Systems Development	April 21– May 2, 2003
19. Bernardo Uribe	Contraceptive Procurement Tables 2003–2004	April 21–May 16, 2003
20. Bernard Fabre	UNEPI Logistics System Assessment	April 28–May 21, 2003
21. Yasmin Chandani	National HIV Test Kit Estimates GFATM Round III Proposal, sections IV and VIII	May 18–28, 2003
22. Sangeeta Raja	Uganda Procurement: Case Studies Report 2003	May 27–June 14, 2003
23. B Copeland	MOH Contraceptive Physical Inventory Survey: August 2003 Estimation of Current National Contraceptive Stocks	June 13–Sept. 12, 2003
24. A. Bahati (DELIVER Kenya)	M&E Training for ARV Logistics Systems	July 20–22, 2003 Aug. 19–22, 2003
25. Mercy Maina	Upgrading the Uganda Community Tracking Database	July 23–Aug. 1, 2003
26. Edward Wilson J. Amenyah	Assessment of LMIS System: Future Needs	Aug. 6–Sept. 6, 2003
27. Abdou Diallo Y. Chandani	Report on Workshop for ARV System LMIS Forms & Job Aids for HIV Test Kits and ARV Drugs	Nov. 17–Dec. 12, 2003
28. Walter Proper Becky Copeland	System design for New TB Drug Distribution System: Assessment	Jan. 15–Feb. 6, 2004
29. Barbara Felling Abdou Diallo Herman Willems	Assessment and Proposed Logistics Systems Design; MOH and JCRC	March 15–April 12, 2004
30. Bernard Fabre	Assessment of UNEPI Logistics Technical Assistance Requirements for the Next Two Years	April 28–May 25, 2004
31. Walter Proper	Strategic Planning for Expanded PEPFAR HIV/AIDS Support	May 16–28, 2004
32. Leslie Rock	Supply Chain Manager Installation SCM Training and Curriculum Development	May 16–28, 2004
33. Abdou Diallo L. Techlemariam	Assessment of Laboratory Logistics System Requirements	May 24–June 11, 2004

Names	Report Title	Dates
34. Abdou Diallo	Report on National Laboratory Assessment Survey Design	Aug. 11–27, 2004
35. Hany Abdallah Becky Copeland	Distribution and Warehousing Cost Review: UNEPI Options and Recommendations	April 12–30, 2004
36. Abdou Diallo David Whybrew	Report on Laboratory Logistics System Design Workshop	Oct. 4–20, 2004
37. Bill Felling Kim Peterson	DELIVER Uganda LMIS MOH IT System Design	Jan. 28–Feb. 18, 2005
38. Edward Wilson	Uganda Public Sector LMIS Requirements	March 7–18, 2005
39. Kim Peacock	TB Training and Curriculum Development	July 7–15, 2005
40. Walter Proper Kim Peacock	Report on TB National Training of Trainers including NTLP Logistics System Manual	July 18–Aug. 17, 2004
41. Karen Ampeh	PipeLine Adaptation and Training for Six Logistics Systems	July 27–Aug. 17, 2005
42. Paul Robinson	Report on Orientation and Budget Planning for FY06	Aug. 19–Sept. 9, 2005
43. Ron Brown	Assessment of Logistics System Needs for JCRC Laboratory Expansion	Sept. 12–23, 2005

APPENDIX 3

LIST OF DELIVER UGANDA STAFF (2001 TO 2006)

Name	Job Title	Responsibilities	Service Dates
Steve Wilbur	Chief of Party	Policy, coordination, management, direction	Oct. 2001–Aug. 2006
Johnson Tumbaze	Senior Driver	Vehicle oversight, Driver supervision	Oct. 2001–July 2006*
Sandra Zawedde	Office Manager	Office & financial management	Sept. 2002–Aug. 2003
Dr. Moses Muwonge	Deputy Director	Advisor, supervisor labs, IT, vaccines	Sept. 2002–May 2006
Becky Copeland	Deputy Director	Advisor, supervisor family planning, training, TB,M&E	Oct. 2003–June 2006
Yolanda Mikaele	Deputy Director	Advisor, supervisor all HIV/AIDS activities	Sept. 2003–July 2006*
Sarah Nakendo	Office Manager	Office administration	Aug. 2003–Feb. 2006
Anita Akishure	Financial Manager	Office and project finances	Nov. 2004–Feb. 2006
Martin Kiyingi	MOH Computer expert - seconded	Maintained MOH logistics computers	Feb. 2003–July 2006*
Stephan Katurama	Data Analyst	ARV data entry and delivery coordinator	Nov. 2003–July 2006*
William Hasho	UNEPI logistics advisor	Vaccines logistics coordinator - UNEPI	Feb. 2004–Nov. 2006#
Bernard Baitwebabo	Data Analyst	TB data entry and deliver coordinator	June 2004–Nov. 2006#
Vincent Ochwo	Driver	Driving & vehicle maintenance	July 2004–July 2006*
Albert Mugume	Training Support	Training coordination, training	Dec. 2004–July 2006*
Paschal Mujasi	Logistics Advisor	Advisor family planning, condoms, TB, malaria	Jan. 2005–Nov. 2006#
Joseph Lubega	Logistics Advisor	Advisor HIV/AIDS Forecasting, quantifi.	June 2005–July 2006*
Peace Kabagambe	Logistics Advisor	Advisor HIV/AIDS NGOs/FBOs	June 2005–July 2006*

Wilson Nyegenye	Logistics Advisor	Advisor Laboratory Systems	Jan. 2005–July 2006*
Rogers Masaba	Office Staff	Office cleaning & maintenance	Oct. 2003–July 2006*
Shaquille Sekalala	Data Analyst	HIV testing data entry and delivery planning	April 2003–July 2006*
Cecilia Segudde	Training advisor	Coordinator all logistics training	May 2005–July 2006*
Francis Okedi	Compound Staff	Compound cleaning & maintenance	Dec. 2004–July 2006*
Kezia Nakajubi	Receptionist	Receiving visitors and calls, coordination	Mar. 2005–July 2006*
Joseph Kiggundu	IT systems coordinator	Set up & maintaining DELIVER& MOH IT	July 2005–Aug. 2006
Henry Senebulya	Driver	Driving & maintenance	May 2005–Nov. 2006#
George Barongo	Financial Manager	Office & project finances	Aug. 2006–Nov. 2006*
Kathy Crowley	Intern Tulane	ARV supervision curriculum design	May 2005–Aug. 2005
Erin Larsson	Intern SIDA	Logistics system field review	May 2006–June 2006
Grace Kabasindi	Admin. Manager	Temporary office management	April 2006–Aug. 2006
Joseph Kasule	Logistics volunteer	Enter data of NMS distribution PipeLine	July 2005–Sept. 2006
Daniel Kibirige	Logistics volunteer	Enter laboratory supply data into new laboratory system	June 2006–Nov. 2006
Tony Jolly Mukooyo	Training Assistant	Coordination of 4 logistics trainings	Various from June 2002

Note:

Staff with an asterisk (*) have moved to the Supply Chain Management Logistics Project

Staff with a pound sign (#) have moved to the USAID | DELIVER PROJECT.

APPENDIX 4

DELIVER/UGANDA COLLABORATING ORGANIZATIONS

Organization	Length of Collaboration	Description of Collaboration
USAID HIV/AIDS Section	4 years, prior to PEPFAR funding	HIV/AIDS commodity technical assistance from USAID to MOH, JCRC, IRCU and other PEPFAR-support NGOs ARVs, HIV tests, cotrimoxazole, PMTCT, VCT, and laboratory supplies
USAID RH Section	5 years	Contraceptive forecasting, annual donor meetings, integrating RH with essential drug pull system, monthly coordination meeting, condoms
CDC	3 years	U.S. Government organization that we collaborate with to procure some essential medicines and laboratory supplies; and also help with quantification of HIV test kits and drugs. Worked closely with CDC to design a new laboratory reagents credit line. Jointly provided training to MOH laboratory personnel. DELIVER collaborated in assessment of CDC program and report writing.
DOD	1 year	U.S. Government organization that we work with to set up condom distribution systems to Uganda military.
UPHOLD/JSI	4 years	JSI project AIDS & education project, district based. DELIVER assisted to implement logistics systems in their districts, including comprehensive logistics training. Advised UPHOLD on their malaria commodity distribution system and provided regular commodity status reports for their district coordination.
AIM/JSI	5 years	JSI project in HIV/AIDS, district based. DELIVER worked to train their districts in logistics ordering, conducted the original baseline survey with AIM, coordinated on TB and laboratory work, and provided regular stock status updates.
Making Medical Injections Safer (MMIS)	2 years, since program start	DELIVER worked with the JSI MMIS project on the logistics of expanding their AD needle distribution to six additional districts. With the MMIS and the Injection Safety National Committee, participated in a video launch for AD syringes and proper waste management.

Organization	Length of Collaboration	Description of Collaboration
JCRC	3.5 years	DELIVER established a logistics system for their ARV program, assisting expansion from 10 to 38 sites. DELIVER also works with JCRC in laboratory logistics system design and have helped plan and recruit for several JCRC logistics specialists. USAID asked DELIVER to work with JCRC to explore the possibility of obtaining a waiver for JCRC purchase of OI drugs. JCRC is reviewing the DELIVER logistics recommendations for improving their whole system approach and are preparing to advertise for logistics officers. Additionally, DELIVER conducts trainings to JCRC staff.
MEEPP	2 years, since MEEPP started	DELIVER regularly contributes to the Monitoring and Evaluation of the Emergency Plan Progress (MEEPP) project database. Coordinates on patient number reporting.
UNICEF	5 years	DELIVER provides logistics system design information for UNICEF procurement planning for the entire vaccine program for Uganda.
World Bank	4 years	DELIVER worked closely with the WB MAP project to start ARV distribution in Uganda through the MOH. Also coordinated procurement and distribution of 160 million WB condoms. Worked also with WB to provide test kits and other AIDS commodities.
UNFPA	5 years	DELIVER works with UNFPA through the contraceptive annual planning process. Financial collaboration took place with UNFPA for MOH and NGO staff training in logistics.
<i>Medecins Sans Frontieres (MSF)</i>	3.5 years	With MSF/France and MSF/Holland, meet regularly to review ARV regimes, transfer of patients, and possible MSF TB interventions. With MSF/Arua, provided updated ARV stock status. With MSF France, provided overview on NTLP request for emergency TB supplies.
Stop TB Partnership	2 years	DELIVER participated in planning sessions and the annual STOP TB DAY meeting and is a founding member of Stop TB in Uganda. There are regular planning and promotion meetings.
Clinton Foundation	3 years	With the Clinton Foundation, DELIVER participated in the MOH decision to request pediatric ARV drugs. Assisted in procuring drugs. DELIVER worked with the Clinton Foundation laboratory specialists to review laboratory supply costs for Uganda. Through coordination between MOH, MAP(WB), GFATM, and Clinton Foundation, DELIVER supported accessing the lowest priced drugs.
National Drug Authority	5 years – regular meetings and contacts	DELIVER has worked with NDA to ensure required registration of all MOH commodities. Without NDA approval and in some cases post-shipment testing, products will not be allowed into Uganda.
Crown Agents	3 years	Collaborated in developing and sharing monthly procurement updates. Worked jointly with Crown Agents on curriculum design and actual orientation of senior UNEPI managers on customs and

Organization	Length of Collaboration	Description of Collaboration
		clearance procedures. Crown Agents is a DELIVER partner, so there has been close collaboration in ARV system design, NMS warehouse improvement, and GFATM product procurement
GFATM	3.5 year	DELIVER worked with MOH on design and quantification and budgets for GFATM Round I and Round III for a total approved amount of over U.S. \$240 million. Coordinate with GFATM to procure ship and integrate \$70 million of GATM commodities for AIDS and TB.
EGPAF	2 years	With EGPAF, DELIVER is coordinating family planning and HIV/AIDS activities. Organized staff training on logistics with financial contributions from EGPAF.
ACCORD	2 years	Providing information on RH commodities and assisting with ACCORD RH startup planning.
AIC	4 years	Coordinating with USAID-supported AIC VCT and PMTCT testing programs. Integrating AIC activities with MOH testing activities. VCT policy Development
TASO	2 years	USAID-supported AIDS organization. DELIVER assisted as they move into ARV provision, but not a key DELIVER partner yet.
CRS	1 year	CRS is providing direct PEPFAR ARV services. DELIVER provides commodity status updates and has shared our commodity tracking software.
PHR+	2 years	With PHR+, participated in MOH public-private database survey day-long launch. Updated ARV procurement costs for PHR+ project report revision.
MSH	3 years	DELIVER had been coordinating with the MSH HMIS project on MOH computerization. Participated in MSH laboratory management stakeholders meeting. Shared with MSH the IT technical assistance reports on MOH Resource Center planning. Helped provide ARV information for MSH work with GFATM.
PSI	5 years	DELIVER has coordinated condom distribution in Uganda with the MOH. PSI was a key player in social marketing condom distribution. Installed PipeLine tracking software and trained several PSI staff. DELIVER worked with the Condom Coordinating Unit (COCU) to arrange for PSI and Marie Stopes International (MSI) distribution of condoms from the districts to local distribution points.
Hospice Africa	2 years	Hospice provides PEPFAR and other supported palliative care for ARV patients. Coordinating on commodity procurement and providing regular supply information. Have been asked to set up new hospice procurement systems.
PATH	2 years	PATH is the procurement agent for MMIS needles and injection safety equipment. DELIVER has had input into coordination and integration of these MMIS products.

Organization	Length of Collaboration	Description of Collaboration
World Vision	1 year	World Vision in a PEPFAR ARV provider. DELIVER has shared the MOH logistics system and provides information on HIV/AIDS commodity availability.
DFID	5 years	DFID, as the British government AID agency, has had an active interest in RH, malaria, condoms, and TB since DELIVER began. Helped coordinated DFID emergency malaria and other supplies and the RH and condom support from DFID.
Ireland AID	5 years	Active donor support to the MOH. DELIVER has worked with them as a key donor to promote and track donor given commodities in ARVs, tests kits, RH, condoms.
GDF	3 years	The Global TB Drug Facility (GDF) is a mechanism to expand access to, and availability of, high-quality TB drugs to facilitate global DOTS expansion. DELIVER provided commodity security guidance and technical assistance to the GDF, including active staff participation in its annual review of the National Tuberculosis and Leprosy Program.
IDA	4 years	IDA sells essential drugs and other commodities to MOH and others in Uganda. They regularly visit and coordinate with DELIVER to get the latest commodity availability information.
DANIDA	5 years	DANIDA provides half the MOH essential drug budget. DELIVER has worked in close partnership with DANIDA since our start, first to change from a push to a <i>pull</i> drug supply system, to improve NMS warehouse efficiency and to coordinate Uganda-wide commodity procurement.
Marie Stopes International	5 years	MSI distributes socially marketed condoms, and DELIVER has worked closely with them to create a condom policy and to coordinate condom procurement and distribution for Uganda as a whole.
GTZ	3 year	DELIVER collaborated with the German government organization on transferring ARV patients to MOH system and with malaria policy planning.
KfW	5 years	KfW supports MSI condoms for Uganda and meets with DELIVER whenever they go to Uganda. DELIVER advocated for continued KfW support to MSI condom distribution during last year's contract renewal.

APPENDIX 5

UGANDA LOGISTICS INFORMATION TABLE BY COMMODITY TYPE

Organization	Funding Source	Procurement	Storage and Distribution	Deliver TA	Remarks
ARVS					
Ministry of Health	GFATM	GFATM	NMS/JMS	Yes	
	MAP Project - WB	WB	NMS	Yes	Completed
JCRC—Joint Clinical Research Committee	Patient payment	JCRC	self	yes	
	MOH	GFATM	self	yes	Often joint sites
	USAID PEPFAR	self	self	yes	
	Research funds	self	self	yes	
Inter-religious Council of Uganda	USAID PEPFAR	SCMS planned	JMS planned	yes	Starting July 2006
TASO	CDC PEPFAR	JMS Med. Access	self	no	
MildMay	CDC PEPFAR	JMS self	self	no	One site
Catholic Relief Services	CDC PEPFAR	CRS Int'l	self	no	
ReachOut Mboya	CDC PEPFAR	Med. Access	self	no	
Mulago Hospital	CDC PEPFAR		self	no	One site
Uganda Cares	CDC PEPFAR	self	self	No/ some	
	AIDS Health Foundation	self	self	no	
	MOH	GFATM	NMS	yes	
Uganda Business Coalition	PEPFAR	self Med. Access	self	no	4 sites now
MSF—France	MSF	MSF int'l	self	yes	
	MOH	GFATM	NMS	yes	
GTZ	GTZ	self	self	no	Hoima
Plan International	plan	self	self	yes	Several districts
IDI	MOH	GFATM	NMS	yes	

Organization	Funding Source	Procurement	Storage and Distribution	Deliver TA	Remarks
Columbia University	USAID core	self	self	no	
Nevirapine—PMTCT	Abbott Donation	Abbott	NMS/JMS	yes	No distribution costs
<i>Pediatric ARVs</i>					
MOH	GFATM	GFATM	NMS/JMS	yes	
	Clinton Foundation	Clinton	NMS/JMS	yes	
JCRC	USAID PEPFAR	self	self	yes	
<i>HIV Test Kits</i>					
MOH	WB	WB	NMS	yes	Completed
	GFATM	GFATM	NMS	yes	
	CDC	NMS	NMS	yes	
	USAID	Crown Agents	NMS	yes	Emergency last year
	WHO	WHO	NMS	yes	Possibility
CDC intensive pilot	CDC	CDC	NMS	yes	
AIDS Information Center	USAID/UPHOLD	AIC	self	no/ some	Training, information
<i>OI Drugs</i>					
Cotrimoxazole	CDC PEPFAR	self	NMS	yes	
Diflucan	Pfizer donation	self	NMS	yes	
<i>STI Drugs</i>					
Various	MOH/DANIDA	NMS	NMS	yes	
	MAP Project - WB	WB	NMS	yes	
<i>Laboratory Reagents</i>					
MOH—60 products	CDC PEPFAR	NMS	NMS	yes	New system
TB	GDF - TB	GDF	NMS	yes	Integrated
	GFATM	GFATM	NMS	yes	integrated
JCRC centers	USAID PEPFAR	JCRC	JCRC	yes	
<i>Essential Drugs—90 Key Products</i>					
	MOH/DANIDA	NMS	NMS/JMS	yes	Training/pull system
	NMS	NMS	NMS	yes	Pipeline system
<i>Contraceptives</i>					
MOH	USAID	USAID	NMS	yes	
	UNFPA	UNFPA	NMS	yes	
	MOH	MOH	NMS	yes	
AFFORD Social marketing	USAID	USAID	self	no	Using pipeline
<i>Condoms</i>					
MOH	MAP Project - WB	WB	NMS	yes	
	DFID	DFID	NMS	yes	
	USAID	USAID	NMS	yes	
	UNFPA	UNFPA	NMS	yes	
	GFATM	GFATM	NMS	yes	

Organization	Funding Source	Procurement	Storage and Distribution	Deliver TA	Remarks
AFFORD Soc. Marketing	USAID	USAID	self	no	pipeline
Marie Stopes Intl	GTZ	MSI	self	no	
Pop. Services Intl PSI	DFID	PSI	self	no	
<i>Vaccines</i>					
UNEPI	MOH	MOH	UNEPI	yes	
	UNICEF	UNICEF	UNEPI	yes	
	GAVI	GAVI	UNEPI	yes	
<i>TB Drugs</i>					
MOH	GFATM	GFATM	self	yes	
	GDF	GDF	self	yes	
<i>Injection Safety</i>					
UNICEF—AD needles	UNICEF	UNICEF	UNEPI	yes	
MOH—general	MOH/DANIDA	NMS	NMS	no	
	NMS	NMS	NMS	no	
MOH—AD	MMIS	MMIS	NMS	yes	
UNICEF—safety boxes	UNICEF	UNICEF	UNEPI	yes	
MOH safety boxes	MOH	NMS	NMS	no	
MMIS safety boxes	MMIS	MMIS	NMS	yes	
<i>Other—Miscellaneous</i>					
Malaria drugs	MOH	NMS	NMS	yes	Coartem review
	MOH-GFATM	GFATM	NMS	yes	GFATM bed net distribution plan
Blood bags	Donor/MOH	Blood Bank	self	no	Previously helped
Medical equipment	Various donors/MOH	donors	NMS	no	
CD4 machines	Many donors	self	self	yes	Trying to rationalize
CD4 reagents	Many donors	self	self	yes	

APPENDIX 6

EXECUTIVE SUMMARY OF LOGISTICS SURVEY 2006

The Uganda Ministry of Health (MOH), in collaboration with other stakeholders working in HIV/AIDS prevention, care, and support services, continues to strive toward improving comprehensive access to these vital services for its people. To support this goal, a baseline Health Facilities Survey (HFS) was conducted in June 2002 to assess the availability of HIV/AIDS services and key health commodities in MOH and NGO facilities. This nationally representative assessment served as an important guide during implementation of the 2000/01–2004/05 Health Sector Strategic Plan (HSSP) I by identifying strengths and weaknesses in service delivery and health commodity logistics management.

During the last five years, the MOH has greatly expanded the availability of HIV/AIDS-related services. Under the HSSP I emphasis was focused on expanding access to health services, particularly at the lower levels of care. Programs for the PMTCT, VCT, and ART were successfully introduced or expanded. A comprehensive patient care package was developed, including management of OIs, particularly tuberculosis (TB), and palliative and home-based care. In addition, there were deliberate efforts made to improve the availability of essential drugs and health commodities by mobilizing funds for commodity procurement, establishing new logistics management and information systems, and training of district managers and facility staff on system procedures.

The HSSP I achievements were accomplished despite the severe constraints of under-funding, continuing inadequacies in availability of trained personnel, frequent stockouts of essential medicines, and lack of equipment for new health centers. The same challenges must also be confronted in implementing the HSSP II (2005/06–2009/10), which will focus on consolidating and expanding the achievements of HSSP I. Over the next five years, under HSSP II, the MOH plans to reach the following targets in HIV/AIDS service coverage:

- 100 percent of HC IIIs providing VCT services by 2010
- 50 percent of HC IIIs providing PMTCT services by 2010
- 75 percent of HC IVs offering comprehensive HIV/AIDS care with ART by 2010
- 100 percent access to information and services, and improving access and availability of condoms by 2010.

The 2006 Health Facilities Survey was designed to provide the MOH with current information that will be useful for designing targeted interventions to achieve the 2010 goals above. The objectives of the survey were to provide—

- current information on the availability of HIV/AIDS prevention, care, and support services, including diagnosis and treatment of other STIs, tuberculosis (TB), and OI, as well as laboratory services and infection control procedures

- current information on the availability of key health commodities and the performance of the logistic systems that manage essential drugs, ARV drugs, HIV tests, PMTCT commodities, and TB drugs
- current information on the training of staff who provide HIV/AIDS support services and manage drugs and other health commodities in health facilities
- a follow-up assessment to the 2002 HFS evaluation to measure the changes between 2002 and 2006.

To ensure that the 2006 and 2002 surveys were as compatible as possible, the same survey tool was used (with some updates); the sample included 11 of the original 12 districts and 210 of the original 226 health facilities included in the 2002 survey.

This report presents the findings from the Commodity Management section of the survey tool. Information collected on the HIV/AIDS Service Information section is being processed by the MOH Resource Center. The Commodity Management section includes data on the availability of key commodities in facilities on the day of visit and during the previous six months; logistics training received by staff; ordering and delivery of supplies; and supervision and storage conditions. The product categories examined included HIV tests, ARV drugs, anti-TB drugs, anti-malaria drugs, contraceptives, nevirapine for PMTCT, and key drugs for STI and OI treatment.

The findings from this 2006 follow-up survey confirm the significant achievements made under HSSP I in expanding access to HIV/AIDS-related services and improving the management of health commodities and product availability. The survey findings also highlight those areas of commodity management and product availability that need to be addressed under HSSP II.

KEY FINDINGS

SERVICE AVAILABILITY

- With the HSSPI focus on extending services to the lower-level facilities, STI services are now almost universal with 95 percent of all facilities; followed by family planning services, available in 91 percent of facilities; and OI services, available in 85 percent of facilities. TB treatment is also provided in all hospitals and HC IVs and the great majority (72 percent) of HC IIIs but only 14 percent of HC IIs.
- Nine percent of the surveyed MOH facilities were currently providing ART services compared to 16 percent of NGO facilities. Comparable figures are not available from the 2002 survey.
- VCT and PMTCT services expanded substantially in MOH facilities since 2002, with both services now provided in roughly 25 percent of the surveyed facilities, up from less than ten percent in 2002. In NGO facilities, availability of PMTCT services increased from 5 to 18 percent of facilities. VCT services increased only slightly, from 21 to 26 percent.
- All hospitals offered the full range of services assessed in this survey. With the exception of ART, services available at HC IVs are now similar to that offered by hospitals. All HC IVs offer OI and STI treatment and laboratory services including TB diagnosis and almost all provide TB treatment (96 percent) and family planning services (92 percent). VCT services are offered in 88 percent and PMTCT services in 85 percent of HC IVs, very close to the 100 percent MOH target: and with 42 percent currently providing ART, the 2010 target of 75 percent has already been met halfway. At current levels, there is still a long way to go before HC IIIs reach the 2010 targets of 100 percent providing HIV testing and 50 percent providing PMTCT services.
- TB treatment services expanded from 40 to 69 percent of the MOH facilities; the percentage able to diagnosis TB almost doubled, from 23 percent in 2002 to 38 percent. Laboratory services, including TB diagnosis, are now available in almost half of the HC IIIs; the laboratory services present in the 20

percent of HC II facilities is primarily for malaria diagnosis but some have the capacity to do more tests.

PRODUCT AVAILABILITY

Suspension of GFATM health commodity procurements in August 2005 caused central- and facility-level stockouts of HIV tests and TB drugs and shortages of some ARV drugs: new supplies had still not been received at the time of survey except for TB drugs. Also in early 2006, there were other *upstream* issues that negatively affected product availability at the facility level.

Essential drugs

- There were substantial increases almost across the board between the 2002 and 2006 surveys in the percentage of facilities that had the essential drugs available for treatment of malaria, OIs, and STIs on the day of the visit. STI drugs showed the highest increase in availability, followed by OI drugs, then malaria drugs. Not only did the percent availability of individual drugs increase, but the percent of facilities with all drugs in a category increased substantially. In 2006, 33 percent of facilities had the two OI drugs, cotrimoxazole and acyclovir, available on the day of visit, compared to only 3 percent in 2002. Similarly, in 2006, 24 percent of facilities had all four STI drugs available on the day of the visit, up from only 8 percent in 2002.
- NGO facilities were much better stocked than MOH facilities: 90 percent or more of the NGO facilities had each of the individual essential drugs on the day of the visit, with the exception of the two drugs that had the lowest percentage availability among the essential drugs (ciprofloxacin and fluconazole). Only one drug, chloroquine, was found in 90 percent of MOH facilities; the other drugs were available in roughly two-thirds to three-quarters of the facilities.
- Four of the top five most frequently stocked out products in the previous six months were the same in 2002 and 2006: cotrimoxazole, metronidazole, benzathine penicillin, and doxycycline. The inadequacy of available funds to meet the high demand for these multi-purpose essential drugs therefore continued with little change.
- The improvements seen in the availability of essential drugs in 2006 are no doubt due in part to the four-fold increase in the amount of funding available for drug procurement since 2002. The changes made to the NMS essential drug logistics system may also have contributed to the improved product availability as the majority of respondents reported that ordering and receiving drugs was easier than before (see below).

HIV tests

- The availability of the individual HIV tests varied, with the highest percentage of facilities having Capillus (75 percent) and Stat-pak (72 percent), followed by Determine (66 percent), and last, Uni-Gold (44 percent). The relatively low percentage of HIV test availability is because all three of the latter tests were stocked out at NMS at the time of the survey, and they had been stocked out at the central level for the previous eight months. Facilities would, therefore, have been using their buffer stocks if they had not stocked out already.
- Seventeen percent of MOH facilities in 2006 had all three HIV tests required for the standard algorithm in stock on the day of visit.

Antiretroviral drugs

- On the day of the visit, nevirapine tablets for PMTCT were available in 86 percent of the MOHs and 63 percent of the NGO facilities that provide PMTCT services; nevirapine syrup was available in 69

percent of the MOHs and 63 percent of the NGO facilities. Nevirapine syrup was not available in 2002, so this represents an important step forward in HIV/AIDS prevention for children.

- Among MOH facilities offering ART, 81 percent had Trimune 30 and 88 percent had Trimune 40. NGO facilities were slightly better stocked with 88 percent having Trimune 30 and 100 percent having Trimune 40.

Anti-TB drugs

- On the day of the visit, 84 and 88 percent of MOH and NGO facilities, respectively, had the main anti-TB drug combination RHZE, the same percentage as in 2002. Only 65 percent of facilities had EH, which was stocked out at the central level at the time of the survey because of supplier shipment delays. The availability of EH was much higher in NGO facilities (89 percent) than in MOH facilities (60 percent), which seems to indicate that JMS was able to supply NGO facilities using their during this time of shortage. Both RHZE and EH are required for the complete treatment of new TB cases; incomplete treatment could lead to drug resistance, which would be a major problem if it occurred on a large scale.
- The other two anti-TB drug combinations—RH+E and RH—were available in 50–60 percent of facilities managing these types of TB cases. Both products had been stocked out at the central level because of the GFATM suspension, and only partial supplies of RH+E had been by the time of the survey. The RH drug was still stocked out at the time of the survey because of supplier shipment delays.
- Nineteen percent of facilities that provide TB treatment services had the three drugs needed to treat adult new and retreatment cases. Comparable figures are not available from the 2002 survey.

Contraceptives

- Eighty percent of MOH facilities with family planning services had Microgynon and Depo-Provera in stock on the day of visit compared to slightly less than 60 percent of the NGO facilities that provide family planning services. This suggests that contraceptive distribution to NGO facilities in particular needs to be improved as there are adequate supplies of both products at NMS.
- Condoms were available on the day of visit in about two-thirds of both MOH and NGO facilities. This is surprisingly high given that the public-sector condom distribution has been on hold for the past six months or more.
- By comparing the 2002 and 2006 samples, it is clear that there was an improvement in availability of the product Microgynon, with 76 percent of facilities now having the product compared to 67 percent in 2002. Microgynon availability now matches that of the most popular method, Depo-Provera, which remained the same between the two surveys at 75 percent. Only condom availability decreased—from 88 percent of facilities in 2002 to 64 percent in 2006. Even with the decrease in condom availability there was a substantial increase in the percentage of facilities that had all three family planning methods in stock on the day of visit, from 24 percent in 2002 to 35 percent in 2006.

COMMODITY MANAGEMENT

- Fifty-eight percent of MOH respondents thought that ordering and receiving supplies process through the NMS credit line had improved somewhat or a lot; 25 percent thought it had become more difficult and 16 percent said nothing had changed. Hospitals and HC II had the largest percentage of *improved* replies, 73 percent and 72 percent, respectively.
- The higher the level of facility the shorter time it takes to receive supplies: the majority of hospitals and HC IV level reported receiving supplies within one to two months, whereas the majority of HC III

and HC II facilities reported that it took between two and three months or more. NMS delivers directly to most hospitals, and 73 percent of MOH HC IV facilities stated that they collect their supplies from the district, which allows for more control over timing. Only 25 percent of HC III and HC II facilities collect their own supplies; 50 percent rely on the HSD to deliver and another 20 percent rely on the district to deliver their supplies.

- Among MOH facilities, 83 percent stated that they determined what to order and 17 percent said a higher-level facility determined their order for them. Forty percent of MOH staff in HC IV–HC IIs reported that that, in general, they receive the quantities they ordered through the NMS credit line system., whereas only 27 percent of hospitals reported they received their ordered quantities.
- The logistics training programs carried out during the last three years reached a substantial majority of facility staff interviewed in the survey. Between 80–100 percent of hospitals and HC IVs had staff trained on logistics management of ARV drugs, HIV tests, nevirapine for PMTCT, and TB drugs. The percentage of HC IIIs with trained staff was somewhat less (60–80 percent) and lowest in the HC IIs.
- Seventy percent of HC IIIs and HC II facilities and 50 percent of HC IVs reported receiving a supervision visit in the last three months that included commodity management activities. This is lower than that reported in 2002, where 85 percent of facilities reported that they had a supervisory visit in the last three months.
- Ninety-six percent of facilities had stock cards available for the selected essential drugs and 80 percent of the stock cards were up to date. The availability of updated stock cards for the other products varied considerably, from 88 percent for Trimune 30, 60 percent for RHZE, and 50 percent for HIV tests. The variation by product in maintaining stock cards may be a result of whether the product is stored in a storeroom or dispensing area.

RECOMMENDATIONS

- Poor stock card record keeping has to be addressed for several reasons, not the least of which is to prevent product loss. Whatever was done and is in place for essential drugs has worked and should be replicated for the other health programs/products. Overall, MOH policies and procedures need to be strengthened regarding accountability of a facility or responsible individual in managing health commodities.
- A significant percentage of health facilities are not placing NMS credit line orders regularly enough or on time. (NMS records show that almost half of the recent orders did not meet the deadline, which means another two-month wait for the next delivery.) HSDs must have order schedules and procedures to help reduce stockouts in their facilities.
- Reproductive health (RH) Division and NMS need to work together with the NGOs to ensure that existing procedures are improved, so they can more easily obtain contraceptives for their facilities.

APPENDIX 7

CONTRACEPTIVE SECURITY BRIEF

Country Profile																						
Population (2004)	26,404,453 (BUCEN-IDB-2004)																					
Population Growth Rate	3.0% (BUCEN-IDB-2004)																					
WRA	5,585,821 (BUCEN-IDB-2004)																					
Fertility Rate	6.9 (DHS 2001) 6.6 (BUCEN-IDB-2004)																					
Contraceptive Prevalence Rate -modern methods, married women -modern methods, all women	18.2 (DHS 2001) 16.5 (DHS 2001)																					
Total Demand	57.3 (DHS 2001)																					
Unmet Need	34.6 (DHS 2001)																					
Source																						
Public Sector	36% (DHS 2001)																					
Private Medical	46.1% (DHS 2001)																					
Other Private	15.7% (DHS 2001)																					
HIV/AIDS Prevalence Rate	7.0% (National HIV Sero-Survey, 2005)																					
Health regions, districts, and SDPs providing RH/FP services (actual number of total SDPs providing FP services not available)	Districts: 77* Potential sub-districts: 227 (estimate) SDPs: 1,979 * Includes 21 new districts. Number of new sub-districts not known.																					
Forecasting																						
Current method mix and projected trend (DHS 2001)	<table border="0"> <tr> <td>Injectables</td> <td>30%</td> <td>Increasing</td> </tr> <tr> <td>Condom</td> <td>23%</td> <td>Increasing</td> </tr> <tr> <td>LAM</td> <td>19%</td> <td>Stable</td> </tr> <tr> <td>Pills</td> <td>16%</td> <td>Stable</td> </tr> <tr> <td>Female Ster.</td> <td>9%</td> <td></td> </tr> <tr> <td>IUD</td> <td>1%</td> <td>Decreasing</td> </tr> <tr> <td>Implant</td> <td>1%</td> <td>Increasing</td> </tr> </table>	Injectables	30%	Increasing	Condom	23%	Increasing	LAM	19%	Stable	Pills	16%	Stable	Female Ster.	9%		IUD	1%	Decreasing	Implant	1%	Increasing
Injectables	30%	Increasing																				
Condom	23%	Increasing																				
LAM	19%	Stable																				
Pills	16%	Stable																				
Female Ster.	9%																					
IUD	1%	Decreasing																				
Implant	1%	Increasing																				

Presentation and use of CPTs in management decision-making	CPTs were prepared jointly with RH/MOH and presented to all donors; funds committed by USAID and UNFPA to cover 100% of requirements. PipeLine was installed and training conducted at PSI and Family Planning Association of Uganda (FPAU).
Assumptions related to data used in the CPTs (approach used)	Consumption included all consumers of public sector contraceptives: MOH units, NGO units reporting to MOH, and non-reporters like national NGOs, Police and Army. Losses of 5% to 10% built in for OCs and Depo. LTPMs expected to rise through MOH/USAID and NGO efforts.
Sources and accuracy of data used in forecasting (data quality)	MOH consumption data available from monthly SDP reports at 91% reporting rate. Degree of accuracy and completeness unknown but used as best data available. No facility stock data available. Inconsistencies found in NMS inventory reports. National Medical Stores inventory and issues data used for mid-year CPT review.
Role of Technical Assistance	DELIVER coordinates and reports on monthly RHCS group meetings to review NMS stock status and distribution issues. Regular stock updates and district issues disseminated to USAID and partners for follow-up. Logistics issues discussed at major RH/FP meetings.
Procurement	
Existence and role of the Procurement Unit	The MOH Procurement Unit does not handle drugs or contraceptives. NMS procures Depo and other RH commodities using MOH/SWAp funds (dedicated budget line). Contraceptives are bought by USAID and UNFPA, condoms are bought by multiple donors.
Stock Status Analysis over one year period (overstocks, stock outs, and consistency of procurement plans)	All USAID 2005 shipments delayed from Jan to June while manufacturers met NDA registration fees and USAID obtained funds for new NDA levy of 0.08%. This caused central stock outs for several months of Norplant, Lo-femenal and Ovrette. Condoms were stocked out from Nov. 04 to Aug. 05 because of quality issues and new NDA post-shipment testing requirement. Depo is now overstocked because of unpredictable MOH shipments and IUDs overstocked because slow uptake. No data available on stock outs at SDPs. Main causes of stock outs are staff not trained in ordering procedures or NMS stocked out. National training completed in Sept. 2005 should correct

	former problem.
Contraceptive supplier situation (percentage of commodities provided by supplier)	In 2005-2006, USAID to supply 48% of MOH contraceptives, UNFPA 28% and MOH 24%. Public sector condoms supplied by multiple sources, USAID to supply 19% in 2005/06.
Historical, current, and future role of USAID as a contraceptive donor	USAID has provided Depo, Ovrette, Lo-femenal, implants, IUDs and condoms to MOH. No change in role or methods anticipated but percent contribution could decrease with more UNFPA funding available. USAID provided condoms, Duofem and injectables to PSI Social Marketing program. USAID supplies will continue under new contractor.
Financing	
Commodity funding mechanism (i.e., basket funding, cost recovery, local public funds, etc.)	Dedicated MOH/SWAP funds available for FP supplies for last three years and next year but RH supplies now added to line item without budget increase. Public sector contraceptives provided free to SDPs and clients.
Current and future donor contribution in commodity financing plan over the next five years	UNFPA and USAID providing 75% of contraceptive procurement in 2005/06. UNFPA percent contribution could increase as more funding now available and pressure to perform has increased. Multiple donors procuring 100% of new condom supplies in 2005/06. Future MOH contribution not known.
USAID/Mission intervention strategies (strategic objectives and plan for contraceptive security)	The Mission's SO 8 team (Improved Human Capacity) has a strong commitment to supporting the MOH's RH/FP objectives with its activities to improve quality and increase availability and access to RH/FP services. Substantial funds support procurement of supplies for the social marketing program with less but essential support going to the MOH for contraceptive and condom procurement. Substantial funding has also been available for DELIVER to contribute to efforts to improve contraceptive security.
Supply Systems	
Length of the Pipeline	At NMS minimum stock level is 6 months and maximum 12 months, with most shipments scheduled at 6 month intervals. SDPs can order every two months and supplies are distributed on bimonthly schedule to district stores. SDPs order

	through HSDs and HSDs pick up supplies from district store. Emergency orders can be placed if needed.
Local institutions involved in RH/FP activities	PSI and MSI support social marketing. MSU, FPAU, Uganda Private Midwives Association and Army/Police provide RH/FP services with public sector commodities.
LMIS status (level of efficiency)	Efficient HMIS with 91% facility reporting and dispensed-to-user data collected but data quality unreliable. No data on stocks or losses available.
Commodity availability at SDPs	NMS bimonthly reports on HSD contraceptive orders used to identify potential SDP stock outs and alert MOH and partners for follow-up. Annual MOH sample survey showed Depo stock outs decreased from 17% to 5% in last year. MOH reported CYP up 10% due to improved contraceptive availability. UPHOLD Yellow Star data collects data on SDP contraceptive stock outs in their selected districts.

Major Issues

There are no national data on contraceptive availability at SDPs. Trends and issues have to be monitored through indirect means and district partners, making it difficult to assess progress. Facility surveys are the only way to measure contraceptive availability.

The lack of stock data means that a combination of SDP consumption data and NMS inventory and issues data has to be used to estimate program stock status and make adjustments to shipment schedules.

The MOH RH Division does not have the capacity to develop and/or adjust procurement plans or monitor logistics system performance. Shipment pre-clearance takes extraordinarily long due to inefficient systems. UNFPA hopes to second advisor to RHD to assist with these functions.

The RH Division reports that accessing SWAP funds for contraceptives takes one year and full amount of funds (approx. \$78,000) may not be available. RH supplies now added to Family Planning line item but budget amount not increased. Future security of MOH/SWAP budget for contraceptives unknown.

The regular group meetings of RH Division, NMS and DELIVER have been successful in identifying and correcting logistic system problems. UNFPA now a member and the newly named RHCS group is expanding membership to include USAID, Population Secretariat and major NGOs.

References:

- Annual Health Sector Performance Report: Uganda, 2005
- Uganda DHS 2001
- US Bureau of the Census, International Statistics Database, 2004

For more information, please visit www.deliver.jsi.com.

DELIVER

John Snow, Inc.

1616 North Fort Myer Drive, 11th Floor

Arlington, VA 22209 USA

Phone: 703-528-7474

Fax: 703-528-7480

www.deliver.jsi.com