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UGANDA: MAPPING THE DISTRIBUTION OF COMMERCIAL GOODS TO THE LAST MILE

DISTRIBUTION ALONG THE NORTH SHORE OF LAKE KWANIA



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Abstract

In February 2008, the USAID | DELIVER PROJECT, Task Order 1, conducted a study of distribution for a sample of common household goods in villages along the north shore of Lake Kwanja in the Apac district of Uganda. The study identified goods that were available at the village level and traced them back through their supply chains to manufacturers or distributors. While tracing the goods, the study examined the levels of inventory and the transportation strategies employed by the commercial sector to assure the availability of goods to remote, rural areas.

The purpose of the study is to provide an overview of some of the effective, alternate distribution channels operating in Uganda, their lessons for the future distribution of reproductive health products, and the strategic opportunities for ensuring distribution to the community level.

Cover photo: Uganda. Simon Ochaka (left) discusses supply distribution issues with local wholesaler, Mr. Erin James (center), seated in the open air market at Ayabi Trading Center (February 21, 2008). Picture taken by John Durgavich.

USAID | DELIVER PROJECT

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

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ACRONYMS

3PL	third-party logistics
AIDS	acquired immunodeficiency syndrome
ARVs	antiretrovirals
CBD	community-based distribution
CPT	cotrimoxazole preventive therapy
DHO	district health office
HAI	Health Action International
HC	health center
HIV	human immunodeficiency virus
HSD	health subdistrict
IV	intravenous
JSI	John Snow, Inc.
KPI	Kampala Pharmaceutical Industries
MOH	Ministry of Health
NMS	National Medical Stores
PHC	primary health care
PSI	Population Services International
SDP	service delivery point
SKUs	stock-keeping unit
STI	sexually transmitted infection
TCs	trade centers
UNFPA	United Nations Population Fund
USAID	U.S. Agency for International Development
USh	Ugandan shilling
VAT	value-added tax
WHO	World Health Organization

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Finally, the authors would like to acknowledge the late Steve Wilbur for his guidance prior to the assignment. His insight contributed to this report, and the spirit of his commitment to public health continues to influence the USAID | DELIVER PROJECT in Uganda.

EXECUTIVE SUMMARY

The purpose of the study was to map the distribution of a select number of commercial goods available on a regular basis in remote areas of a country and determine how this can be applied to contraceptives or other health products. Specifically, this report describes—

- the physical distribution process from the national capital or district capital to the village/remote area
- motivational factors that ensure product availability, i.e., the importance of the product to the community and profit to be made by the seller
- the applicability of these distribution processes to health goods.

Food, fabric, fertilizer, water pumps, other vital goods, and what some may consider “luxury items” such as soft drinks and cigarettes are routinely available in remote areas via supply chains that make their way to the farthest reaches of a country. Some goods flow within the formal economic sector—soft drinks, for example—while others may reach the village level through informal channels. Whatever the mechanism, some goods can always be found in remote areas, while the availability of other goods is often less reliable.

The report describes mechanisms and incentives that drive the movement of regularly available goods—including beer, cooking oil, matches, paracetamol, salt, soap, and toothpaste—from the producer or supplier to the consumer in a remote location of Uganda. Some of the practices observed may be relevant to family planning and other health goods.

A team consisting of John Durgavich (the consultant), Betty Nabirumbi from USAID/Kampala, and Simon Ochaka (a local consultant with Langi language skills and experience in facilitating focus groups) spent February 18–20, 2008, collecting data along the north shore of Lake Kwana. Focus group discussions and key informant interviews covered availability, cost, and use of a variety of products, including cooking oil, salt, beer, matches, lotions, soap, airtime cards, condoms, water treatment tablets, toothpaste, and paracetamol. Five manufacturers in Kampala were interviewed to further elaborate the distribution chain from the supplier perspective.

Initial key best practices identified from commercial distribution in Uganda include—

- good control of retail and wholesale pricing to the trade center level, using price lists and reinforcement by distributors and manufacturer sales representatives
- sales data monitoring to at least one tier below
- short lead times, typically one day or less
- low inventory levels/high turnover (little or no expiration)
- third-party contracting for transportation, transportation performance metrics, and contract compliance
- bulk fuel purchasing.

STUDY DESIGN

Food, fabric, fertilizer, water pumps, other vital goods, and what some may consider “luxury items” such as soft drinks and cigarettes are routinely available in remote areas via supply chains that make their way to the farthest reaches of a country. Some goods flow within the formal economic sector—soft drinks, for example—while others may reach the village level through informal channels. Whatever the mechanism, some goods can always be found in remote areas, while the availability of other goods is often less reliable.

Mapping the movement of regularly available goods from the producer or supplier to the consumer in a remote location of a developing country may reveal insights about the mechanisms and incentives that drive the process.

The purpose of this study is to map the distribution of a select number of commercial goods available on a regular basis in remote areas of a country and determine how this can be applied to contraceptives. Specifically, the study will look at—

- the distribution process from the national capital or district capital to the village/remote area
- motivational factors that ensure product availability, i.e., the importance of the product to the community and profit to be made by the seller
- the applicability of these distribution processes to health goods.

BACKGROUND

The USAID | DELIVER PROJECT has a core-funded mandate to provide technical assistance to help USAID Family Planning teams (a) review the alternate distribution channels, (b) evaluate potential innovations for reproductive health product distribution, and (c) advise on opportunities for ensuring distribution down to the “last mile.” In discussions between the project and USAID in Washington, D.C., a proposal was developed to assess distribution alternatives in Uganda that could serve as models for improving the distribution of reproductive health products at the community level.

WHAT IS THE “LAST MILE”?

The “last mile” is a term used frequently in the telecommunications industry to describe the periphery of network’s coverage, the ability to get information into the household or into the hands of a client. The term is also used in the home delivery industry where things like groceries may be delivered directly to the customer’s door. For the purpose of this paper, the definition of last mile supply chain is “that portion of the supply chain delivering products directly to the consumer” (Kull et al. 2007).

This simple definition of the last mile will hold whether the topic under discussion is grocery delivery, cell phone network access, sharing information over the Internet, retail through a fixed location, or delivery of health services. Whenever a commercial enterprise or a government makes it

its business to deliver a good (including information) or a service, its success or failure has to be judged on its ability to get that good or service into the hands of the intended consumer.

By way of comparison, the popular online encyclopedia *Wikipedia* offers some examples of last-mile distribution from the physical world: “Some familiar analogies are—

- blood distribution to a large number of cells over a system of veins, arteries, and capillaries
- water distribution by a drip irrigation system to individual plants, including rivers, aqueducts, water mains, etc.
- nourishment to plant leaves through roots, trunk, and branches.

All of these have in common conduits which carry a relatively small amount of a resource a short distance to a very large number of physically separated endpoints. Also common are conduits supporting more voluminous flow which combine and carry the many individual portions over much greater distances” (Wikipedia 2007).

International donors have been involved in trying to solve last-mile problems in developing countries for decades, even if donors do not always use the term. USAID has invested substantially in bridging the last-mile gap in telecommunications (Best 2005) with substantial emphasis on “last mile.” There are some differences, of course, between telecommunications and physical distribution of merchandise. Distribution of retail merchandise is always in discrete and discontinuous packets that are obvious to the observer in a way that information in a telecommunications network is not, because the speed of distribution of retail merchandise is on a slower, human scale. Physical goods move through (and sometimes wait for relatively long periods at) various tiers on a variety of transportation equipment, touched by different persons and requiring different levels of accountability, as they move from the manufacturer to the household. In these ways, distribution of public sector goods strongly resembles the physical distribution of retail merchandise, which is the subject of this study. Many donors have invested in provision of health services and, more recently, in strengthening supply chains to ensure the flow of goods such as essential medicines. These are also last-mile problems.

Manufacturers and central distributors, including distributors like National Medical Stores (NMS), have the capacity to move large volumes over long distances (usually over better roads) and achieve economies of scale, sharing costs over thousands of customers. At the periphery, locally optimized distribution moves small volumes over shorter distances, and these small movements serve a small pool of customers who typically have to bear the costs. In retail, demand and customer satisfaction signals, which may be strong at the local retail level, are more challenging (and expensive) to acquire and interpret at the distributor and manufacturer levels. Generally, resources like information and money tend to flow from the customer to the supplier, while merchandise and information flow from the supplier to the customer; but the paths of these flows can vary greatly between the public and private sectors or between product categories.

The last mile is not strictly a distribution or access problem, and the “mile” to be covered is not limited to physical distance. In the telecommunications industry, the “mile” might represent convincing a new cell phone client to get a handset so he or she can access a nearby tower. In this sense, access becomes less a problem of distance than of motivating the customer to get the product into the household. Because motivation plays such an important role, the last-mile problem is not strictly an access issue: it is a product of access and motivation.

Motivation is an important factor in how organizations address last-mile problems. In the commercial sector, vendors are strongly motivated by profit to make the last-mile gap as short as possible while maintaining affordability. Profit is essential to the survival of the enterprise and the self-interest of the vendor. Public sector institutions have to find alternate sources of motivation.

Every product that finds its way into a household must jump a last-mile gap of some kind; and as the study observed in Uganda, the gap can vary substantially by product because of differences in profitability, demand, motivation, availability, and other factors related to the product.

Health products jump last-mile gaps. Immunization programs, for example, might be able to get effective vaccines and safe injection equipment to an outreach center like a school or clinic through a mobile unit, but actual coverage depends on parents closing the gap with their children. In reproductive health, community outreach and social marketing programs employ their strategies to close the last-mile gap through improving access and market promotion. Similar approaches are applied to closing the last-mile gap for goods like vitamin A, mosquito nets, and water purification tablets, as well as to the retail goods that were the subject of this study. Health service delivery points (SDPs) face a particular challenge in Uganda in that they have to offer a fairly wide range of services, requiring many different products, and the demand for these services and products can vary because of seasons and disease patterns.

Village retailers offer fewer goods and services than do health centers, and the demand for household goods is far more predictable. The parallel between health services and retail would therefore seem stronger (in the authors' opinion) for routine resupply products like contraceptives and medicines to treat chronic conditions like human immunodeficiency virus (HIV) infection and diabetes rather than campaign products like vaccines.

Village retailers have chosen their profession and are motivated by business imperatives and profit to maintain their shops. Health centers, particularly those in rural areas, are staffed by one or two health professionals, generally a nurse or a medical assistant, or sometimes a doctor. Trained medical professionals go into their careers to serve patients—seldom out of a desire to become supply managers or pharmacy technicians. A study conducted by Inkthe Mathauer and Ingo Imhoff (2006), “Health Worker Motivation in Africa: The Role of Non-Financial Incentives and Human Resource Management Tools,” provides descriptions of a wide variety of nonmonetary motivations for health worker performance.

While professional recognition ranked as the most important nonmonetary motivator for health workers, the study, conducted in Benin and Kenya in 2006, indicated that having the means and materials to do their jobs would increase health worker willingness to perform. “Means and materials” ranked third in Benin¹ and fifth in Kenya when defining health workers' understanding of motivation. However, this study did not provide information on health workers' specific attitudes toward supply management or whether these tasks were clearly defined aspects of health worker performance in job descriptions, training, and supervision.

“Appreciation from clients is seen [by health workers] as an indicator for successful professional conduct and the achievement of the health workers' goal to cure patients” (Mathauer and Imhoff 2006). For health workers, professional satisfaction and recognition from patients can be viewed as analogous to the recognition of the local retailer's status in small rural communities. Recognition by supervisors and positive feedback were also identified as strongly motivating in Benin and Kenya.

¹ This is something of an understatement. In the Benin example, Mathauer explains that “means and materials” was both an explicit motivator as well as an implicit motivator behind “encouragement,” the strongest motivator in the Benin case.

CONTEXT

Uganda is a landlocked country in eastern Africa bordered by Sudan to the north, the Democratic Republic of Congo to the west, Rwanda and Tanzania to the south, and Kenya to the east. In mid-2007, the population was estimated at 28.5 million. The life expectancy at birth for both men and women is 47 years of age. In 2005, the gross national income per capita in purchasing power parity terms was U.S.\$1,490 (Population Reference Bureau 2008a).

Uganda is ethnically diverse: 12 African ethnic groups make up the majority of the population, with the largest being the Baganda at 18 percent. (This posed a challenge for the study as the team had to identify a qualified interpreter for the focus group work before the final approval of the study site.) Uganda's economy is based primarily on agriculture and the processing of agricultural products, fish and fish products, and electricity production from its vast network of lakes and rivers. Uganda has about 45,000 kilometers of roads, of which only 3,000 kilometers are paved (Population Reference Bureau 2008b).

In the southern Apac district along the shore of Lake Kwana, the principal language spoken is Langi, and the principal economic activities are fishing and agriculture. Cash crops include sunflower seeds and cotton, although these were not in evidence at the time of the study owing to the dry season. Subsistence crops include cassava (abundant) and a variety of seasonal vegetables. The main road that parallels the lakeshore is graded dirt, and a number of focus group respondents voiced their concern about the generally poor conditions of the road and the fact that it had not been graded for some time. Normally a wetland, according to local informants, the southern Apac district has been suffering an extended dry period. In Acobanok, the residents pointed out the receding water lines and noted that they now had to dig a channel to reach the lake with their boats.

METHODOLOGY

This study report describes the flow of materials and activities associated with the flow of goods that arrive to a remote, rural area of Uganda. The interviews and focus group data collection were open ended, rather than formal or structured, to facilitate discussion with vendors and distributors who would object to a formal process or the perception of being audited by a third party. While the data collected were largely qualitative, the researchers also collected data on the processes, lead times, costs, and financing strategies associated with distributing a selection of household goods assumed to be ubiquitous in rural villages. The two main outputs are diagrams summarizing those flows and a report of the post-study observations regarding the applicability of observed distribution strategies for moving public health goods.

An initial list of goods to study was developed in Washington, DC. Discussion included identifying products that would meet the following criteria:

- universally available at the village retail level
- potential transportation and storage requirement similar to health sector goods.

The study design team decided to develop a list of 10–12 products with the expectation that not all of the products would actually be found at the village level and would have to be eliminated. Additional discussion concerned whether goods like bicycle parts, lubricant, vehicle repair supplies, fishing supplies, or watch batteries ought to be included, as these are associated with particular types of services or commercial activity in the way that medical supplies are required for the provision of health services. These goods were excluded based on the first criteria. Based on the second criteria,

hazardous products like paraffin (kerosene) were excluded. The team determined that it would focus on finished goods.

The original product list included shampoo. Based on a recommendation from the Uganda field office, hand lotion was substituted for shampoo. This turned out to be a good choice. Shampoo was not available at the village retail level while several brands of hand lotion were in evidence.

To trace the flow of goods, the study team began in the periphery, identifying brands of the target products available in small, rural villages and tracing the chain of suppliers for these goods back through intermediate suppliers, stockists, distributors, and finally back to manufacturers in Kampala.

A team consisting of USAID | DELIVER PROJECT consultant John Durgavich, Betty Nabirumbi from USAID/Kampala, and Simon Ochaka (a local consultant with Langi language skills and experience in facilitating focus groups) spent February 18–20, 2008, conducting focus group discussions and vendor interviews along the north shore of Lake Kwana (Cawente, Akokoro, and Ayabi Counties). The team spent February 19–20, 2008, interviewing suppliers in Lira. Focus group discussions covered the availability, cost, and use of a variety of products, including cooking oil, salt, beer, matches, lotions, soap, airtime cards, condoms, water treatment tablets, toothpaste, and paracetamol. Over this period, the team conducted 3 focus groups and 26 key informant interviews. From the information collected, the team began constructing distribution maps to describe the manner in which merchandise arrives in low-population-density rural villages.

The USAID | DELIVER PROJECT consultant then interviewed five manufacturers in Kampala to further elaborate the distribution chain from the supplier perspective.

DATA COLLECTION STRATEGIES

The team used three principal data collection strategies: key informant interviews, focus group discussions, and a literature review.

Key Informant Interviews

Key informant interviews and discussions with stakeholders were used in the study planning as well as during the main data collection phase. At the end of the data collection phase, John Durgavich, the principal researcher, discussed the initial findings with Ministry of Health (MOH) personnel.

The principal researcher also had discussions with USAID/Washington and Kampala, John Snow, Inc. (JSI) staff, AFFORD (social marketing) project staff, and MOH officers in Kampala. These discussions helped determine which products would be studied and where to conduct the main data collection.

Focus Group Discussions

To obtain consumer information regarding brand selection and preferences, perceptions of affordability, and cost of supply, the team conducted focus group discussions in three villages: Te-ilwa, Oparomo Cell, and Acobanok. To facilitate the discussion, flip charts were prepared with images of the products to be studied, and a focus group script (appendix A) was drafted and translated into Langi. Focus groups were led by the team interpreter, Simon Ochaka, assisted principally by Betty Nabirumbi. John Durgavich served as an observer and made sure that the team's observations and notes were written up in English at the end of every day.

Literature Review

The principal researcher searched the Internet and queried key informants for pertinent references. Of particular interest to the final analysis of applicability to public sector health is the NMS Task Force report, *Matrix of Recommendations from NMS Reviews* (Ofosu-Barko 2008), which was being prepared at the time of the study. This study validates some of the recommendations made in the past by various logistics consultants to improve the management of public health goods—practices that are already being applied in the private sector in Uganda, such as outsourcing transportation.

SITE SELECTION

The study describes a particular kind of distribution environment and is not intended to be generalized to the whole of Uganda. Because of the limited time and financial resources, only one district could be selected for focus group and village-level data collection. The team adopted an “inconvenience sample” approach in which they tried to identify a location where clients are generally underserved and where the following factors pose difficult logistical challenges:

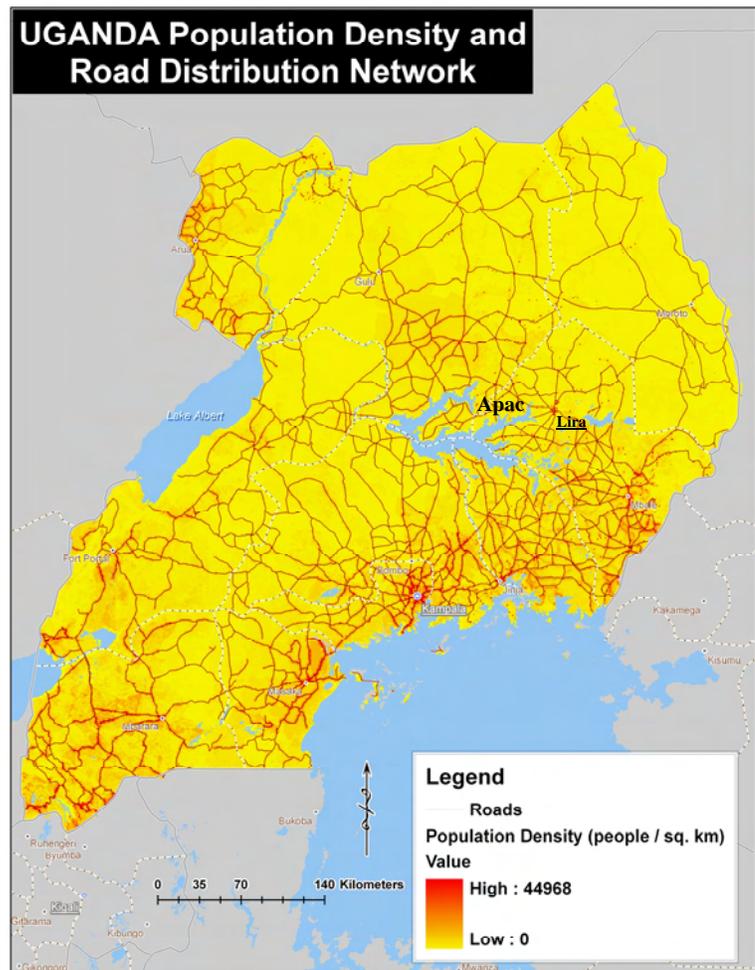
- low population density
- location on tertiary roads or at the terminal ends of tertiary roads
- distance from Kampala.

Through discussions with stakeholders in Kampala, two districts were identified as fitting these criteria: Mbarara and Apac. Of these two, Apac was selected because it was a district where USAID projects were providing some support. Moreover, the team felt that supply chains in Apac were most likely to trace back to Kampala, while sourcing in Mbarara might lead back to Rwanda or Tanzania, which would have created logistical problems for the study.

Ultimately, the team determined to visit three small villages along the shore of Lake Kwana in the Apac district: Acobanok, Oparomo Cell, and Te-ilwa. They also visited—

- trade centers (Ayei, Kwibale, and Wigweng)

Figure 1. Uganda Population Density and Road Distribution Network



- mid-size towns in the Apac district (Aduku and Apac)
- major urban centers (Lira and Kampala).

ETHICAL CONSIDERATIONS

Letters were obtained from the MOH to introduce the study objective and the data collecting team. Both briefing and debriefing meetings were held with the district speaker, chief administrative officer, and district MOH representatives in Apac, and any district-sensitive issues that were raised during the focus groups or by informants were dutifully communicated to the district managers.² Consent was sought from all interviewees with clear indication that responding to questions was optional. Interviewees were informed about the purpose of the data collection and were also told with which stakeholders their responses would be shared. These points were covered prior to focus group work and key informant interviews. No coercion was used during the course of this study, and the study team allowed time to field questions and record concerns raised by the interviewees.

SAMPLE AND LIMITATIONS

Data was collected from three focus group discussions; interviews with 18 retailers located in villages and towns of southern Apac; five intermediate suppliers or stockists, principally located in trade centers and Lira; and six regional distributors. The distributors visited were all based in Lira. The principal investigator also interviewed representatives of six Kampala-based manufacturers and two social marketing programs.

Table 1. Types of Informants Visited, by District

	APAC	LIRA	KAMPALA
Village-level Retailers	6		
Trade Center Retail/Intermediate Suppliers	12		
Stockists		5	
Distributors		6	
Manufacturers/Social Marketing Managers			8

The first limitation of the study is that the sample size is small. Because of the distances and road conditions, it was not possible to visit more than one district. Although the purpose of this study is descriptive, it would have been useful if the study could compare findings from at least one other district. The study assumes that the costs for supplying, transporting, and storing the goods (as well as the vendors' unit sale profit) are captured in the margin. This highlights the second limitation, which is that all numbers are self-reported. There was no possibility of auditing records; indeed, at the village level, written records were limited. Except for beer at the distributor level, we saw no posted price lists. Reported purchase and sale prices for the goods studied varied between supply chain partners (see table 2). In addition, wholesale prices for consumer goods were reportedly going up over the past few months because of supply problems caused by the conflict in Kenya. It was clear that village retail market prices did not always reflect the wholesale reality, even for locally

² Informants did request that the team share specific feedback related to road conditions, school management, and rural electrification programs—issues that were outside the objectives of this study—and these were communicated during a debriefing with district managers at the end of the field data collection.

manufactured goods. Reported wholesale and stockist prices for cooking oil, for example, did not appear to be reflected in the retail price.

The third limitation of the study is that some informants did not know or would not tell the study team certain information considered proprietary, such as their sales and/or purchase prices. Inconsistency in the cost of resupply could be due to informants reporting inflated purchase prices or lower sales prices to reduce the appearance of their margins, to actual price fluctuations, or to poor memory. Not surprisingly, there is high correspondence between the retail prices cited by the village retailers and the focus groups. There is more variability in reported resupply cost at the village retail level. This is likely because the village-level retailer can source goods from trade centers or from stockists, depending on the retailer's motivation and access to cash and transport, but all of the limitations associated with self-reported data apply. Few of the stockists would share any supply price information, considering it proprietary. This led to a number of D/Ks ("Don't Know"), particularly in the stockist columns of table 2 for cooking oil, laundry soap, baby jelly, and salt.

Table 2. Purchase and Sales Prices in US\$ as Reported by Different Informants

Product	Focus Group Buy	Village Retail Sell	Village Retail Buy	Trade Center Sell	Trade Center Buy	Stockist Sell	Stockist Buy	Distributor Sell
Condom, Protector, 3 pieces ¹	300	300	100	300	100	115	D/K	100
Paracetamol, loose tablet	25	17	5.5	7	5.5	N/A	N/A	4.3
Beer, Eagle, bottle	1,300	1,300	1,200	1,200	1,000	N/A	N/A	1,000
Cooking Oil, Mukwano 3-Star, 8.5 kg jerry can ²	30,000 (US\$ 300 /100 ml)	30,000 (US\$ 300 /100 ml)	29,000	N/A	N/A	31,000	D/K	30,900
Laundry Soap, Nomi, 50 g sachet	250	250	183	183	167	D/K	D/K	168
Lotion, Movit Baby Jelly, 60 g jar	700	700	583	N/A	N/A	500	D/K	N/A
Airtime Card, Celtel, 1,000 units	1,100	1,000	D/K	1000	960	N/A	N/A	950
Airtime Card, MTN, 2,000 units	2,200	2,000	1980	N/A	N/A	N/A	N/A	D/K
Salt, Kay Salt, 200 g bags	300	300	183	183	150	150	D/K	N/A

Notes:

N/A stands for "not applicable." Where "N/A is used, it means that a tier was not relevant to the distribution of the product in the study area.

D/K stands for "don't know." Where D/K is used, the team could not find an informant who would provide the information during the course of the study.

1. The "stockist" in this case is a large pharmacy that supplies from the distributor and retails a sleeve of 60 pieces for US\$ 2,300 to smaller retail pharmacies. Village and trade centers are both acting as retailers in the condom market and supply either from the distributor or an AFFORD representative.

2. Cooking oil prices varied between locations as did the distribution chain, so the prices in the table represent a single chain where sales prices were clearly reported by the merchants.

Distributors, on the other hand, were willing to share current sale price information, but reported both variability and a recent upward trend in the prices of consumer goods when asked about supply price. In the case of airtime cards, one distributor felt strongly that both the sale and supply prices were proprietary while another felt that this information could be shared.

One final limitation is that this study focused on locally available goods at the last mile of the distribution chain in rural Apac. A study starting in a different location would likely have a different list of brands.

Future studies may wish to examine imported goods, tracking the products from the port of entry as the starting point because many challenges and opportunities in the supply chain begin at port of entry. Salt, for example, is imported from Kenya, crosses the border at Malaba, and is picked up by stockists who procure it and transport it directly to Lira. Salt does not pass through Kampala to reach Lira and Apac at all. The team could not visit Mbale and so could not speak to an importer or distributor to get a supply price for salt. Soap and aspirin are manufactured in Kampala, but some of the raw materials are imported. However, the study was focused on distribution of finished retail goods, so this line of questioning related to importation issues was not pursued.

Table 2 shows that village retailers in Apac charge a wide range of margins: 8 percent for beer, 20 percent for hand lotion, 36.6 percent for laundry soap, and 39 percent for salt. These margins allow the village retailer to cover costs plus profit and to provide the goods at prices acceptable to the customers.

The table also demonstrates that the supply chains are different for the different products reaching the village retail level. Not all goods pass through the same distribution tiers to reach the end user. This accounts for the N/As (not applicable) in the stockist columns for beer, paracetamol, and airtime cards, and in the trade center columns for hand lotion and airtime cards. In Apac, that level was bypassed by the retailers who were interviewed for the study. Most of the goods pass through three tiers; but products like laundry soap pass through up to four intermediate tiers, and products like airtime cards pass through only two. Distribution requirements are very different for the large cube, heavy, laundry soap and the small cube, low-weight airtime cards. Although the former requires the distributors to plan for significant, dedicated transportation and storage, the latter can piggyback on public transport like bus lines and requires only modest storage space.

GOALS AND OBJECTIVES

The purpose of the study was to provide an overview of the alternate distribution channels, their lessons for the future distribution of public health goods, and the strategic opportunities for ensuring distribution at the community level.

To that end, the study was designed to—

- assess alternative distribution strategies employed for commercial goods
- suggest how lessons from commercial distribution might be applied to public health goods in Uganda.

OBJECTIVES

This report details the study team’s findings on—

- existing distribution operations, including funding and related sustainability mechanisms and policy circumstances
- commercial operations in six supply chains supporting a selection of commercial products available at the village level
- applicability of the distribution strategies employed in alternate supply chains to public health goods
- insights on how reproductive health products could be distributed to meet public health objectives
- innovative distribution strategies that could be integrated into the overall strategic supply chain plan for delivery of pharmaceutical products in Uganda.

IN-COUNTRY SUPPLY CHAIN

The different supply chains that support the availability of commercial goods at village retailers tend to follow a basic pattern. A distributor requisitions products from a manufacturer. The distributor supplies stockists, and stockists supply retailers located in trade centers (TCs) and villages. Retailers, in turn, supply customers. However, the actual physical distribution strategy can vary by product.

DISTRIBUTION TIERS

Goods generally travel through three to four tiers to reach rural communities. Village retailers and TC retailers/wholesalers are the principal source of goods to rural customers (see distribution map).

Most manufacturers use some sort of regional distributor model, and for the most part regions are defined by the road network and geographic access issues. The exception observed is beer distribution, for which the regions are defined by sales volume.

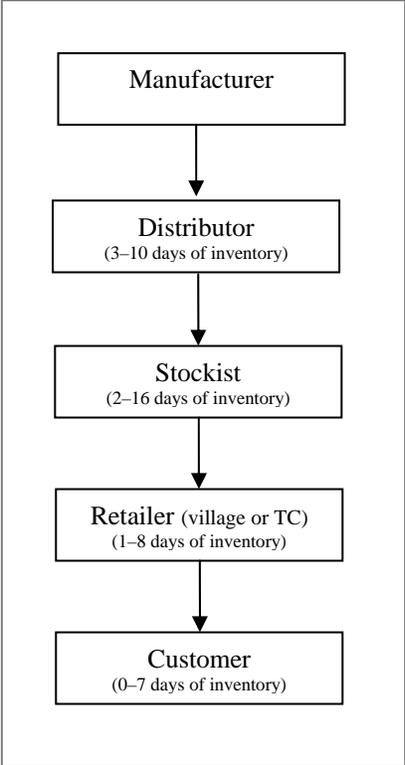
CUSTOMER LEVEL

If the last mile is getting the goods to the consumer, it is important to understand some of the characteristics of the household and how that relates to its purchasing and consuming the merchandise.

According to the focus group participants, the typical household size in southern Apac is six to eight persons. The households in the village are not more than one or two kilometers from the village shop, and at least one member of the household will visit the shop at least once per day. Travel is almost always by foot, although a small number of participants mentioned bicycles. Customers typically buy three items during a shopping trip, but the range is as few as one product to as many as six per trip. Participants suggested that multiple items purchased at one time may be associated, like cooking oil associated with onions and curry, or matches associated with paraffin or cigarettes.

Participants explained that certain products are always kept on hand in the home in small quantities. These include matches, salt, soap, and toothpaste. Customers tend to procure in very small quantities, usually no more than a few days' supply—a point that was made in 2007 in *The NEXT 4 Billion* (World Resources Institute 2007). At the extreme of this behavior in Apac is cooking oil, which is purchased in extremely small quantities (100–140 ml) on a meal-by-meal basis.

Figure 2. Basic Flow of Commercial Goods to Central Uganda



Other products in the study—beer, condoms, paracetamol, and lotion, for example—are purchased on an as-needed basis for immediate consumption.

Focus group participants indicated that all transactions were for cash, while village retailers mentioned occasionally providing credit to certain customers.

Cost/quantity or value for money was the main criterion for customer preference, particularly for items like soap and toothpaste. Smell was also specifically mentioned as important in customer preference for hand soap, laundry soap, and condoms. Participants in two of the focus groups mentioned that Ngabu condoms had a “bad smell.” This issue of smell was documented in the white paper *Ugandan Condom Crisis* (Center for Health and Gender Equity 2005). However, no cause was ever identified at that time, and all Ngabu condoms sampled passed quality control tests in 2004.

Table 3 illustrates the unit retail prices offered for goods along one distribution chain.

Table 3. Rural Unit Retail Prices for Four Products, in US\$

Product	Rural Retail Sites			Stockist Bulk Price/Unit in Lira (pack)
	Oparomo Cell (0 km)	Kwibale Trade Center (2 km)	Ayei Trade Center (14 km)	
Movit Baby Jelly	700	700	700	500 (144)
Nomi Laundry Detergent	250	250	200	167 (120)
Kay Salt	500	400	400	150 (30)
Krishna Matches	100	100	100	32 (1,000)

For these products, there was little price difference between what individuals would pay for a single unit of product in the village versus what they would pay for an identical product at the nearest trade centers. However, the trade centers offer additional premium brands as well as a wider range of goods and volume discounts to rural retailers.



Measuring out cooking oil in a village shop

VILLAGE RETAIL LEVEL

Two of the three villages visited each had only a single general merchandise retailer. The largest village visited, Te-ilwa, had several small shops, but only one large general merchandise shop. No village retailer in the three small villages visited carried more than 50 items on their shelves. However, the villages visited were also no more than 2–14 kilometers from their nearest trade center, so walking or taking a bicycle to the nearest trade center was an option for most customers. The advantage of the village retail level is convenience. Correspondingly, the village retailer stocks

only those items for which there is a fairly constant demand, such as cooking oil, laundry soap, matches, salt, toilet soap, sugar, sweets, paraffin, and tea. Retailers purchase products like cooking oil and laundry soap in bars in bulk quantities (8.5- and 17.5-kilogram jerry cans of cooking oil, 600-gram bars of laundry soap in 25-bar cases) and then sell them in smaller units (100 or 140 milliliters of cooking oil (see photo), one-quarter bars of laundry soap). Customers generally bring their own packaging for cooking oil and paraffin, but twists of paper or polyethylene bags are available for dry goods like sugar. Salt, powdered laundry detergent, tea, and so forth are sold in small manufacturers' sachets, enabling customers to buy as little as 200 grams of salt, 50 grams of laundry detergent, and 10 grams of tea (see photo).

Beer, lotion, toothpaste, and water purification tablets were stocked in some, but not all, village retail sites visited. Paracetamol was available if there was a village clinic (Te-ilwa) or through a trade center drug seller. Condoms were available in the village only where there was a community-based distribution (CBD) agent (Te-ilwa). Otherwise, men buy condoms in trade centers. Similarly, consumers generally travel to trade centers for airtime cards and to charge their cell phone batteries.

Transport and Distribution

Village general merchandise retailers replenish their own stock by shopping from their suppliers and organizing their own transport, usually space on shared, public transport, provided by third parties. The costs of transport are summarized in table 4.

Table 4. Cost of Transporting General Merchandise from Supplier to Village

Mode of Transport	Route, Sourcing from...	No. Items	Cost of Goods (USh)	Transport Cost (USh)	Cost as % of Goods
Third-Party Truck	Acobanok from Lira (70 km)	8	215,000	12,000 ¹	6%
	Te-ilwa from Lira (52 km)	26	700,000	50,000 ²	7%
Bicycle	Oparomo Cell from Ayei Trade Center (14 km)	5	66,000	6,000	9%

1. Example is for traveling to Lira and transporting eight cartons on public transport.

2. Example is for hiring and filling a pickup truck.

Generally, depending on the product(s), the retailer travels weekly to either Lira or a trade center to resupply their stores. The resupply trip generally takes one day. Transport to and from the resupply point for all retailers was typically by “public” third-party truck, but sometimes by bicycle.

Anecdotally, one village retailer reported picking up as few as 8 or as many as 26 items during a typical resupply visit (from as little as USh 100,000 to as much as USh 700,000 in merchandise). Transport of that merchandise by third-party truck involved making a roundtrip to a trade center or to Lira, with reported transport costs varying widely. Focus groups joked about their local retail “monopolists,” but the local retailer may be paying 12 percent or more of the cost of the goods procured for transport for a single resupply trip. Moreover, a village retailer has to spend time on resupply. For example, if a village retailer in Te-ilwa wants to travel to Lira, he or she can bicycle to the nearest town, Konaboko, which takes about two hours. Lira is a one-hour drive by car from

Konaboko, but the traveler might wait an hour or two before finding a vehicle ready to travel, so a one-way trip might take up to five hours. After shopping in Lira, he or she then has to arrange return transport. A single resupply trip is a full-day affair.

Third-party trucks have no set schedule in this part of Apac and may not be available when needed. Bicycle is probably the most flexible transportation option. When the supplier is nearby, bicycle can be cost effective. In the example above, an US\$ 66,000 purchase travels from the Ayei trade center to Oparomo Cell. The supply trip takes less than three hours to complete. However, bicycle becomes less efficient over longer distances for small quantities of goods. Higher rental fees and longer travel time account for the difference. The same value of goods traveling by bicycle from Lira, 67 km away, would cost US\$ 10,000 or 15 percent of the cost of goods, and the trip would take more than 12 hours to complete. It made sense for the village retailers in Acobanok to take advantage of the nearby trade center, even if the unit wholesale price from his supplier in Ayei was 10–25 percent more than the stockist price in Lira.

In the sites visited, estimated village margins for retail goods like matches (11–45 percent) and laundry soap (26–36 percent) must cover all the costs of a retailer's operation, allow for increases in the cost of resupply and transportation, and provide a profit. Retailers prefer one-stop shopping for resupply and try to source from either a single trade center vendor or a single stockist in Lira with whom they have a relationship. Financing is strictly cash-and-carry.

Last Mile Implications

Village retail fills the role of a neighborhood convenience store, with some advantages and disadvantages.

Advantages:

- proximity to the end customers/convenient access
- intimate knowledge of consumer demand.

Disadvantages:

- little or no product choices for consumers
- higher unit prices.

There is no pooling of distribution resources at this level, and there are relatively few stock-keeping units (SKUs). Consequently, there is an opportunity for distributors or stockists to step into that role with a delivery truck/topping-up model to close the gap between village retail in southern Apac and Lira. Some additional research would be required to determine if such a model would (1) benefit the retailers and consumers, and (2) be profitable given the low total volumes and poor road conditions.

Another gap (or opportunity) for the village retailer is access to credit. Village retailers do not generally have capital to grow their inventory to avoid stockouts. Lack of capital also makes it difficult for them to experiment by adding or promoting new products—and village retailers are rarely included directly in national promotional campaigns.

One important lesson for the public sector is that important costs are associated with transport to the village level (6–9 percent of the supply cost for general merchandise). In public health, where the service levels are expected to be high, some review of transportation costs could reveal important

budgeting shortfalls. In addition, the opportunities presented by third-party transporters, so important in the commercial sector, have yet to be exploited in the public sector.

TRADE CENTER LEVEL

Trade centers are established in the subdistricts to provide access to goods and services to smaller villages and scattered households. Trade centers also provide a location for these villages and households to bring their fish, produce, or other goods for sale on market day and sometimes serve as pickup points for middlemen or manufacturers sourcing raw materials like sunflower seeds and cotton. (However, some trade centers lack facilities for collecting local produce.) Access to local trade centers is good for the villages visited; the villages were from 2 to 14 kilometers away from the nearest trade center, manageable by foot or bicycle for retailers and consumers.

An individual trade center vendor may carry more than 500 SKUs and offer both retail and volume-discount or “wholesale” pricing. Typically, a vendor offers one or two units “free” for the purchase of an entire carton or full strip of merchandise. Trade center vendors may be willing to subdivide products like cooking oil and laundry soap for individual consumers. Of the 12 vendors interviewed at the trade center level, only one said he would not subdivide into smaller retail units.

Pharmaceutical items (paracetamol, condoms, etc.) are not sold by the same vendors as general merchandise; however, because trade centers have clusters of shops, including specialty shops, these items would be available in the trade center.

Transport and Distribution

None of the trade center retailers interviewed provided any kind of delivery services to the village-retailers. Like the village retailers, trade center vendors pick up most of their goods from suppliers, stockists in Lira and Masindi, by third-party truck—although we did hear more about vendor-owned and supplier-owned transport at this level. Financing, again, is strictly cash-and-carry.

Reported transport costs for resupplying general merchandise to the trade center varied from as little as 1 percent to as much as 6 percent of the cost of goods (see table 5).

Table 5. Cost of Transporting General Merchandise from Supplier to Trade Center

Mode of Transport	Route, Sourcing from	No. Items	Cost of Goods (USh)	Transport Cost (USh)	Cost as % of goods
Own Car	Ayei from Lira (27 km)	15	1,850,000	20,000	1%
	Ayei from Masindi (195 km)	50	2,000,000	38,000	2%
Supplier's Truck	Aduku from Lira (38 km)	10	500,000	30,000	6%

One type of merchandise in this study is very actively distributed to all trade centers: beer. Beer is delivered by the distributor from Lira to this region for USh 25,500 per crate of 25 bottles (USh 25,000 plus USh 500 delivery fee per crate). The trade center vendors, in turn, sell beer for USh 1,200 per bottle, collecting a margin of USh 4,500 for each crate of 25 sold. The smallest beer vendor we visited (in Wigweng) sold no less than 30 crates of beer between resupply visits. For beer,

however, there is a catch. The vendor is required to return empty bottles to the distributor, and with a deposit of US\$ 100 per bottle, lost or broken glass can cut into a vendor's revenue.

To a lesser degree, socially marketed condoms, lotion, and cell phone airtime cards may also be actively distributed to the trade center level, but only to the larger trade centers like Ayabi and Ayei or towns like Aduku. Smaller village trade centers in southern Apac are not yet targeted for active distribution by these industries.

Last-Mile Implications

Trade centers offer a wide range of goods within a reasonable travel distance for most village retailers and consumers. In our study, the trade centers were between 2 and 14 kilometers from the village centers.

Our focus group participants in the three villages lived closer to one of the four trade centers in the study than to the nearest government health center, which was from 13 to 30 kilometers away. This suggests that the trade center could be an accessible location for public health interventions like mobile clinic outreach, health education, immunization-day campaigns, or even routine supply of medications for chronic illnesses like diabetes or acquired immunodeficiency syndrome (AIDS). Targeting public health "events" to coincide with market day in the trade centers would take advantage of the rural population's proximity and further increase attendance. As with village retail, trade centers present both advantages and disadvantages.

Advantages:

- wide variety of goods and services
- strategic location for other business (selling and buying).

Disadvantages:

- distance for some customers.

STOCKIST LEVEL

Of the five stockists interviewed in Lira, three dealt with pharmaceutical products (paracetamol, condoms, and water treatment tablets) and two with general merchandise. None sold beer. Stockists serve as a one-stop shopping point for village and trade center retailers. The inverse of the village-level retailer, stockists are located near their source of supply (the distributors) and pay little for transport for the stock they requisition. Stockists deal in very high volume, offering wholesale prices to retailers. Some stockists also have access to two weeks' free credit from their suppliers.

Stockists receive goods, often delivered weekly or semi-weekly, from the distributor in multicase loads, but will break the bulk shipment down into individual cases or smaller. They may also do some small retailing to walk-in customers. In general, the stockists interviewed in Lira do not make transportation to their customers a focus of their business. They do manage their own transportation for products like salt and toothpaste, for which there are no distributors based in Lira. The main costs to the stockist are associated with (1) storage, because they are located in an urban area, and (2) inventory management, because of the large number of SKUs.

Transport and Distribution

Stockists own their own vehicles and, for a fee, offer transportation services to their larger urban and trade center customers who require it. None of the stockists would discuss what they charge for transportation, but trade center vendors in southern Apac indicated they may pay a flat fee like US\$ 30,000 or a fee of US\$ 8,000 plus US\$ 500 per carton. Transport costs include the costs of loading the vehicle, but not always offloading the vehicle. Inexpensive casual labor is usually available for offloading. Distribution is always on a requisition basis. Orders are typically placed by walk-ins, but can also be placed over the phone for known and trusted customers.

Stockists, particularly the large stockists within Lira, receive deliveries from distributors that provide transportation in town. Stockists mainly use their own vehicles to pick up goods from suppliers that do not offer delivery services, including suppliers of items like toothpaste and pharmacy items from Kampala and salt from Malaba.

By providing one-stop shopping, the stockist occupies a role similar to a national, regional, or district medical store, but it is important to note that the stockist catchment area is not restricted by political boundaries. Most vendors in southern Apac source from Lira because it is easy to get there, and stockists flourish in Lira, with business coming from as far away as Gulu (112 kilometers by road).

Two of the large pharmacies visited also serve as distributors for two different socially marketed condoms plus water treatment tablets. The stockist level, whether a large pharmacy or a general merchandise stockist, does not deal with airtime cards or beer. These goods have different distribution strategies, which are detailed in appendix B.

Last-Mile Implications

The stockists occupy an important middle ground in the distribution chain for most goods; they procure goods in bulk and provide one-stop shopping for retailers. Most rural retailers cannot buy in bulk and need the stockists' break-bulk service. Stockists also provide some transportation service, at least to larger customers. Although the team visited only five stockists, dozens of such ventures were operating in Lira. Stockists of general merchandise in Lira are located very close to commercial distributors.

Stockists occupy a central role consolidating and wholesaling goods to retailers at the trade center and village retail level. In terms of last-mile availability, the stockist level presents both advantages and disadvantages.

Advantages:

- wide variety of goods
- bulk prices.

Disadvantages:

- distance to last mile, located in city
- limited service, what you see is what you get.

The three large pharmacies visited, on the other hand, source their goods from manufacturers and distributors based in Kampala. Social marketing programs are already leveraging the capacity of these large urban pharmacies to distribute condoms, oral contraceptives, and water treatment tablets.

It might be possible for the public sector to leverage large urban pharmacies' capacity to source as well as to distribute a selection of the most commonly prescribed medicines in some parts of Uganda. However, to provide effective third-party procurement and distribution services to the public sector at a reasonable cost through these pharmacies, there are at least four conditions:

- The MOH would have to be able to identify a segment of essential health products for which such a strategy would be appropriate.
- The MOH at the national and district levels would have to be willing to rationalize and redraw the distribution map for the selected segment of commodities so that it reflects transportation realities on the ground.
- Financial management controls would need to exist at the levels where such services were procured (e.g., the district).
- The MOH at the national and district levels would have to have the capacity to contract these services and to monitor and manage service contracts.

Whether or not the third-party option is explored, the public sector could model its own geographic distribution network strategy after the demand and distance-driven network of the private sector pharmaceutical industry. The main difference to remember is that the public sector is driven to provide services to the poorest and most peripheral patients, while the private sector distribution is driven by sales.

DISTRIBUTOR LEVEL

Distributors are local agents with exclusive sourcing agreements with a manufacturer in exchange for a territory. For instance, Celtel distributor will agree not to distribute UTL airtime cards, and a Mukwano distributor will not distribute Rafiki laundry soap. As the name implies, distributors make transportation part of their core business.

Because a distributor represents a manufacturer, the distributor's product lines mirror the manufacturers'. In Lira, one distributor carries 280 SKUs, from cooking oil to soap and plastic household goods, while another distributor carries three kinds of soap. Typically, a distributor can get credit from the manufacturer by purchasing through a supplier account. But in one case, the distributor has a "channel partner" arrangement with the manufacturer, keeping sufficient capital in an account to allow the manufacturer to be paid on shipment. Distributors and manufacturers try to work as seamlessly as possible, sharing sales, inventory, and production data and using scheduling and routine order quantities to ensure continuous supply. For cooking oil and beer, both fast-moving products, full truckloads arrive at their distributorships several times per week. Information and orders are largely communicated by fax or telephone. In the case of beer, the distributor and the brewery use a collaborative planning model.

The communications industry is a special case. An airtime card has a very small physical volume or "cube." Their distributors tend to use distribution of airtime as a way of adding on to or diversifying their business. In one case, the distributor owns a bus company and leverages routine commuter travel to transport small-cube, high-value telecom merchandise with no additional transport cost. The lotion studied, Movit Baby Jelly, is the only product in the study that does not use a regional distributor in its model. The reason is that Movit has made transportation a core function at the

central level and has combined transportation with marketing activities to literally drive their products into the market.

Transport and Distribution

Distributors coordinate fleets of vehicles, but the numbers and types of vehicles vary. Distribution regions can be quite large—covering several districts for things like beer, cooking oil, and soap—or relatively small—covering just parts of particular districts for telecommunications equipment and airtime cards. Beer distribution in Lira and Apac districts requires a large Mitsubishi Fuso, while delivery in town may use smaller pickup trucks. Taxis and motorcycles transport airtime cards and cell phones. Cooking oil and soap travel in both full and mixed truckloads to stockists and large retailers as far north as Gulu.

Many factors go into determining the distributor's region. These include resupply frequency, volume, population catchment, and road network. Because airtime cards require very frequent resupply (two times per day in town and every one to two days elsewhere), because it operates on a cash-and-carry system, and because the carriers move small volumes over poor roads to top up their clients, a compact region provides good return while limiting liability. Cooking oil traveling in full truckloads or mixed loads to urban retailers and stockists is a high-cube, high-turnover business that needs a bigger catchment area to be competitive and profitable. Northern Uganda is less densely populated than the south, so the distribution regions are large in the north. Also, regions are not static. One manufacturer mentioned plans to split a region due to increased access and demand in northern markets—a benefit of successful peace talks between the government of Uganda and the Lord's Resistance Army.

Last-Mile Implications

The most important feature of the regional distribution model is how regions are defined. In Lira, the regions can be large, stretching as far as Gulu to the north. This allows a regional distributor to operate in a zone that reflects transportation infrastructure and capacity realities, to deal independently with its clients over a manageable geography, and to pool enough demand to operate profitably. Similar to the recommendation based on observation of the stockist level in the preceding section, the MOH could group districts into rational distribution regions. Another important feature of the distributor level is that it positions inventory closer to the demand and centralizes distribution and payment collection functions within a defined region.

In terms of last-mile availability, the distributor level presents both advantages and disadvantages.

Advantages:

- manufacturer-level prices
- good data management
- strategic location based on demand.

Disadvantages:

- sells only to stockists and large customers
- distance to last mile, located in city
- limited variety of goods.

This level of the commercial model demonstrates that different categories of products may require different distribution plans. In public health, one could compare the costs associated with storing and moving the low-volume, high-value antiretroviral drugs (ARVs) to the costs of storing and moving extremely bulky and heavy intravenous (IV) solutions.

With ARVs, the MOH needs to move small-cube, high-volume products in a very responsive, demand-driven strategy to avoid wastage and prevent mortality in HIV and AIDS program patients. This situation suggests a small package delivery model. On the other hand, IV solutions, like cooking oil, move at a fairly predictable rate to fewer, larger locations. This suggests that a bulk transportation strategy—possibly full truckloads direct from the manufacturer—might be appropriate for large hospitals. The commercial sector demonstrates significant opportunities to apply a segmentation approach to supply chain strategy because of the good availability of third-party transporters with various vehicle capacities and regional expertise in this environment.

MANUFACTURER LEVEL

The principal researcher was able to interview representatives of six Ugandan manufacturers, Population Services International (PSI), and the AFFORD Project in Kampala to discuss central-level strategies. Because each of these organizations deals only with the products it markets, individual products are treated in more detail in appendix B. Three concerns seemed to be common across the eight organizations: sales, product quality (or integrity), and retail price to the consumer. Each industry has its own strategies to promote sales growth and customer satisfaction. Each manufacturer also tries to apply best practices in its industry when it comes to transportation and distribution. Best “first mile” practices in Kampala include the following:

- good control of retail and wholesale pricing to the trade center level through price lists and reinforcement by distributors and manufacturer sales representatives
- strategic decision making on supply chain management based on sales volume and greater profit potential
- sales data monitoring at least to one tier below
- short lead times, typically one day or less
- low inventory levels, high turnover (little or no expiration)
- third-party contracting for transportation
- transportation performance metrics and contract compliance monitoring
- bulk fuel purchasing.

THE LAST MILE: PARALLELS IN COMMERCIAL AND PUBLIC HEALTH DISTRIBUTION

PRODUCT-RELATED ISSUES

In rural village retail, choices of goods are limited, and demand is less influenced by marketing than by availability. In the cities, for example, dozen of options are available for laundry soap. In a rural village, the one or two brands that are available sell. Choice is less important than availability, and

the perception of quantity for money is itself an indicator of quality to the rural consumers in the focus groups. Village retail provides only a small number of needed goods, focusing on everyday items that reflect the basic needs of the local community. Similarly, rural health centers need to focus on their own minimum package of essential services to address the needs of a majority in the local community. Village retail and rural health centers should both, in principle, be about providing convenient access to the most needed goods or services.

In rural village retail, the funds available for resupplying the shop are directly related to sales. In public health, the funds available to supply medicines are budget allocations based on forecasts of what services central planners estimate will be most in demand, and so there is a much greater margin of error. Health budgets are never sufficient to procure the inventory required to cover every possible configuration of demand for every required medical service.

One last-mile strategy to address consumer demand for small-volume purchases is “sachet-izing.” Interestingly, in the case of cooking oil, the half-liter bottle being marketed in Uganda may still be too large (from the consumer perspective) or too small (from the village retailer perspective) for distribution at the village level. A higher unit price for cooking oil may be unacceptable to the consumer, while a higher unit price for laundry detergent poses no barrier. Alternatively, the quantity of cooking oil in the smaller bottles is, for some other reason, still too large for the household—or perhaps the product is too new. Additional research would be required. The problem could also be linked to supply: the packaging could be too bulky and increased transportation costs would cut into the retailers’ margins, so they do not stock the small bottles.

Package-size discussions are becoming more frequent in the health sector. Examples include the use of smaller vaccine vials to reduce wastage and packaging cotrimoxazole for cotrimoxazole preventive therapy (CPT) in 30-tablet bottles to facilitate dispensing. However, smaller sized manufacturer containers are not always embraced as a solution in small villages. Mukwano industries introduced a 500 ml bottle of cooking oil, but these were not found at the village retail level. It is possible that higher unit price per ml and/or the increased bulk of the packaging have been barriers to the village retailers’ selection of this product over the traditional larger jerry cans. The Mukwano experience with cooking oil cautions us that the benefits of reconfiguring the package size need to be weighed against the cost of additional packaging, transport, and storage requirements before rolling out a new package. Cost is not the only consideration for changing packaging. Packaging can affect the stability of the product. In addition, for some products, like condoms and antimalarials, packaging is used to promote client compliance with correct use through inserts or colorful illustrations. Generally, a trial period to test the acceptability of new packaging before a national roll-out is going to be worth the investment.

TRANSPORTATION

In the commercial sector, as in public health, one of the biggest challenges to closing the last-mile gap is access: getting services to people or people to services. In the case of supply chain for public health products, we talk about getting goods to SDPs.

As in the commercial sector, transportation challenges in the public health sector include poor roads and insufficient vehicle capacity, including the cargo-carrying dimensions of available vehicles (small pickup trucks at the district government office) and inability to operate during the rainy season. Nevertheless, bicycles, cars, and trucks are moving in this resource-constrained setting over the same poor road conditions, and a number of commercial goods do get through.

Transportation is often characterized as a barrier to good logistics performance in the public health sector. However, transportation is a requirement, not a barrier. To close the last mile in village retail, the retailers in this study, without exception, managed their own transport in order to pick up merchandise from their supplier. They do this because this is their business. Their livelihood and their social standing in the community depend on their ability to ensure the availability of a small basket of key goods for sale in the villages at a reasonable price. The expectations and motivations in rural health centers are different. Goods and services in the clinics are supposed to be given free of cost to the clients; but routine resupply of goods is not guaranteed, and goods are frequently in short supply in the Apac district. Transportation resources are scarce for all residents for all purposes at the village level, and that scarcity contributes, along with poor road conditions, to the cost of transportation.

Third-party contracting for transportation may be the rule for general merchandise, but the types of vehicles used to transport most commercial goods may not be suitable for the safe and sanitary transportation of many medicines. As with beer manufacturers and distributors, the government has a strong interest in maintaining the quality of fragile products and may need to invest in transportation resources to support this requirement. As Movit demonstrates, it is also possible to use a delivery truck topping-up strategy to efficiently deliver (and promote) up to 45 product lines at a time—even from a central distribution point in Kampala. Some type of regional delivery system might be an efficient solution for a modest basket of essential medicines as part of a segmented strategy to serve rural health centers. Although this might not work for all products, a segmented transportation strategy and a flexible approach can be highly effective. For example, Kampala Pharmaceutical Industries (KPI) uses its own vehicles to deliver goods to large, nearby customers and uses third-party transport contracts or customer pick-up for more distant clients or for smaller clients. Contracting a third-party transporter, difficult at the rural SDP level, should be feasible at the higher levels from which they are supplied and can help ensure distribution at least as far as intermediate points for pick-up by the customers or for local small-package carriers to pick up the goods for delivery to peripheral sites.

DISTRIBUTION

This study observed that commercial goods reach the villages in southern Apac transit through at least three, and more typically four, distribution tiers. The number of SKUs that travel together in the various supply chains varies, depending on both the product and the tier. Some products, like laundry soap, travel in full truckloads from Kampala, while cosmetics travel in mixed truckloads. However, the all-important stockist level in Lira is where all of these products tend to come together for the village and trade center retailers. This setup has two potential implications for distribution of public sector medical supplies. The first major implication is that the two-to-three-tier system currently managed in the public sector is not necessarily inefficient, and that simply reducing tiers is not a de facto solution for pipeline issues in the public sector. The problem is the length of the pipeline and how long (and how much) inventory is held in those public sector tiers. The second implication is that a regional distribution model has been shown to be effective for most of the commercial products. Lira serves as a hub for several parallel industries that use it as a base to cover a wide geographic region encompassing most of the northern districts of Uganda as far as Gulu.

For commercial goods, village and trade center retailers requisition their merchandise and generally travel to their supplier, a stockist, for this purpose. In this sense, the trade center is just a larger version of village retail.

Health centers (HCs), where service is delivered, may depend on the NMS and the district government to organize transport for dozens of items that are allocated to them. Unlike the village and trade center retailers, HCs do not have the resources or the motivation to manage last-mile distribution. Neither is there a profit mechanism for them in health product distribution, unlike the commercial sector. Communications between the HCs and the districts is not frequent enough or complete enough for the district officers to take on this role and respond routinely and effectively, tailoring allocations to the HC requirements. Fortunately, the village and trade center retailers are all close to their resupply points. They have short lead times, typically one day or less. They may lose some efficiency because the retailer himself or herself generally has to make the roundtrip and spend some time shopping at one or more stockists. In the case of southern Apac, there is a missed opportunity to communicate requirements in advance to the stockist-supplier via cell phone.

The only real exception to the pickup model for the last-mile level was beer, actively distributed to the trade centers in a delivery truck topping-up system. However, active beer distribution at this level was for only 1–4 SKUs. This suggests that this model might be more appropriate for a high-volume, high-value product—for example, HIV tests—but not for an essential-medicines program with 100 or more SKUs. As with beer in the commercial sector, different segments of public health commodities may require different strategies to help close the last-mile gap. For certain products, smaller inventories and more frequent resupply intervals may be both possible and practical.

Both the village retailers and the commercial distributors hold almost no inventory, typically less than two weeks of stock, and resupply themselves frequently. Public health facilities, in contrast, have almost no control over their resupply schedule, and the resupply intervals are long, creating higher likelihoods of stock imbalances, stockouts, and expirations in the public health setting.

While village retailers and commercial distributors maintain very low inventory levels, stockists, with no reliable consumption data, must hold substantial inventory if they are to be responsive. The retailers understand local demand, and there is a high turnover rate and subsequently little or no expiration. However, retailers do experience occasional stockouts of basic goods like cooking oil and laundry soap, particularly in the rainy season when transportation is difficult. So it is clear that transportation constraints like road conditions and weather patterns should be considered when establishing inventory levels.

In contrast, stockists do not stock out unless there is a supply failure upstream. In the public sector, HCs try to resolve the uncertain demand issue by holding higher inventories the way stockists do, budget and physical storage space permitting. But it might be more effective to focus on increasing turnover and supply chain visibility.

MOTIVATION AND INCENTIVES

Commercial motivations for logistics often do not apply to the public health sector. In the public health setting at the lower levels, logistics is no one's full time job, and there are no consequences for poor performance or rewards for good performance. In the commercial sector, the consequences are enormous: failure to deliver goods would put a retailer out of business.

It might be tempting to suggest that rural HCs simply be given a vehicle or allocated a transportation budget for resupply of goods so they could conduct their business as the local retailers do. But a retailer is accountable to him or herself for commercial survival, and this driving motivation does not exist in the public health setting. Nonmonetary motivation for the village retailer includes status or reputation in the community. Alternative, nonmonetary motivations for public health workers are needed, but commercial sector retail does not provide examples. However, as was described on

pages 13 and 14, other important incentives can increase service provider ability and willingness to provide quality services.

COMMUNICATIONS

Rural electrification has not reached this part of Uganda, but cell phone technology has. Residents are not on the grid, but they find alternatives using available battery technology at the village and trade center levels. Solar charging might be an opportunity for a more-sustainable, less-polluting solution to charging cell phones. Solar power is also a potential way to deal with the need for electricity in rural HCs and villages: the village retailer (an early adopter of the technology) could offer phone recharging for a fee. The existence of cell phones and a network may create interesting opportunities to improve communication between HCs and district health offices (DHOs) for a variety of purposes, including notifying the DHO of stock problems, submitting epidemiological surveillance reports, and requesting assistance with medical emergencies.

THE FIRST MILE

It is impractical to talk about the peripheral supply chain without a discussion of the upstream partners that supply and drive it. Manufacturers and wholesalers have a keen interest in serving their customers at the distributor and stockist levels. Maintaining consumer satisfaction and brand loyalty through product consistency and reliable supply is a common feature of program management from socially marketed condoms to paracetamol to beer. Manufacturers and wholesalers also need to be able to forecast demand in order to plan production schedules and raw materials procurement.

PROMISING STRATEGIES

In 2003, the World Health Organization (WHO)/Health Action International (HAI) launched an initiative to measure the costs and affordability of medicines (Laing, Forte, and Cameron 2007). Uganda was part of the Africa regional component of the initiative in 2004 and 2005. WHO/HAI made a number of specific recommendations related to price control: (1) regulating mark-ups at the wholesaler and retailer levels through higher mark-ups on lower-priced products; and (2) reducing or removing taxes and tariffs, including value-added tax (VAT), on essential medicines. It comes as no surprise that they also recommended ongoing monitoring of medicine prices to increase price transparency and reduce in-country price variation. While the concerns of commercial manufacturers were related to marketing, not equity, price transparency and consistency are also concerns of the commercial industries that were part of this study.

Commercial manufacturers maintain good control of retail and wholesale pricing to the trade center level through price lists and reinforcement by distributors and manufacturer sales representatives. The NMS could communicate service delivery and essential product information through dated catalogues and circulars. This is a practice already in use in Tanzania and other countries in the region.

Large commercial manufacturers monitor sales data—at least that of their contract distributors and channel partners—to estimate demand. In principle, the public sector health system monitors both client and dispensed-to-client data, but neither type of data is particularly complete or accurate. One of the big differences between the private and public sectors is the frequency and nature of communication. Manufacturers' representatives are in touch with their major clients at least weekly by phone. Supervision in the public sector, when it takes place, could provide an opportunity to look at stock imbalances; and periodic customer focus group research could provide needed feedback on the clients' perception of quality for family planning and other public health services.

Low inventory levels and high turnover are key issues for manufacturing in Kampala. Some, like the pharmaceutical industry, make continuous supplies of products like paracetamol, but make other products to order. Others, like the cosmetics industry, have fairly routine production runs but can use their marketing detailers to push product out to the field to a certain degree.

By far the most consistent practice was third-party contracting for transportation. All the commercial manufacturers but one contracted out at least part of their central distribution operations. The cooking oil, soap, beer, and pharmaceutical manufacturers all mentioned the importance of transportation performance metrics and the use of these metrics in developing

contract requirements and measuring transportation contract compliance. Contracting third-party transport is under discussion at the NMS. A measured approach would be to set up a pilot to compare the costs and performance of an NMS-managed fleet to third-party contracting. Performance metrics should be applied to both the third-party transporter and the contracting agency. Since compensation of the transport contractor is always tied to volume transported per kilometer, idling vehicles is a major problem for transporters. Therefore, proactive shipment planning and efficient loading and unloading to reduce idling time should be as much a part of the NMS strategy as effective, responsive, and efficient fleet management by a third-party contractor.

In one example of leveraging the potential of private sector models, the Ministry of Health of Mozambique, with support from the Gates Foundation, began a program called Village Reach (Global Giving Matters 2004). Under Village Reach, the MOH/Mozambique has contracted its distribution to rural HCs through a private third-party agency. The MOH in Uganda could examine the experience in Mozambique to see if there are applicable lessons. It should also be noted that in 2002, Hany Abdallah, Mike Healy, and Tim O’Hearn analyzed the costs of distribution from the NMS to the district and subdistrict levels in Uganda, and so there is already a model for assessing the strategic outsourcing model. The 2002 study analyzed the possibility of distribution from the NMS and concluded that a third-party option would be beneficial only if “the transport contractor can bring benefits that NMS cannot achieve for themselves, for example, compatible products for delivery [to share costs] on the outbound run or back loads for the return journey that reduce the overall unit costs of transport” (Abdallah, Healy, and O’Hearn 2002).

One of the innovative practices of Nile Breweries is bulk fuel purchasing through a contract with Shell Uganda Ltd. This allows Nile Breweries to save 4 percent on diesel fuel, which it passes on to its third-party transportation contractors. Use of corporate credit cards provides flexible refueling options for the drivers and also helps the brewery monitor fuel usage by driver to identify and correct any abuse. Whether the NMS moves to outsource transportation or chooses to manage its own fleet, bulk fuel purchasing would be a very good practice to emulate, particularly as fuel prices continue to rise.

Table 6 summarizes some of the best practices observed during the course of the study in Uganda.

Table 6. Best Practices in Commercial Distribution

Product	Characteristics	Public Health Parallels	Best Practices
Beer	<ul style="list-style-type: none"> • heavy • high volume • small number of SKUs • large, constant demand • short shelf life • standard load sizes and distribution frequencies • requires special equipment • return policy on glass bottles 	Health sector products with similar shelf-life characteristics include vaccines, ARVs, HIV rapid test kits, and lab reagents.	<ul style="list-style-type: none"> • Regional distribution network based on sales volume offers an alternative, more responsive approach than basing distribution on geopolitical units or trying to manage all central distribution from a central hub. • Transportation outsourcing. • Nile Breweries has developed interesting innovations in transportation contracting, including bulk fuel purchasing, and transportation monitoring (including monitoring in-transit

			<p>loss, the time it takes to run specific routes, and safety procedures by individual drivers).</p> <ul style="list-style-type: none"> • Strong emphasis on data management, sales monitoring.
Soap and Laundry Detergent	<ul style="list-style-type: none"> • heavy, dense • high turnover • small number of SKUs • large, constant demand • substitutable • stable, long shelf life • can travel in mixed loads or full truck loads • needs to be kept dry 	<p>Soap is similar to more stable essential medicines like paracetamol and to non-drug consumables like latex gloves that are used in primary health care (PHC) centers.</p>	<ul style="list-style-type: none"> • Less than two weeks of inventory is held at retail level. Stockists (intermediate distributor) may hold significant quantities to meet retail demand. Distributors hold almost no soap buffer stock, basically passing inventory through to the stockists and large retail customers as quickly as they receive it. Soap demonstrates that high-demand products can still be made available to customers in rural Uganda while maintaining low overall inventory levels. • Transportation outsourcing.
Cooking Oil	<ul style="list-style-type: none"> • large cube • high turnover • variable package sizes 	<p>Cooking oil is similar to liquid reagents, cleaning supplies, and IV fluids in the sense that it is a liquid that comes in large, heavy containers.</p>	<ul style="list-style-type: none"> • Storage space is one of the critical issues when dealing with large-cube, high-volume products, and the industry mitigates the problem by reducing the resupply period and the corresponding inventory levels. • Transportation outsourcing.
Airtime Cards	<ul style="list-style-type: none"> • high value, small cube • high turnover in urban settings • low volume in rural settings • cell phone and access to network required • ability to recharge cell phone required 	<p>Rapid tests for HIV, malaria, and sexually transmitted infections (STIs)</p>	<ul style="list-style-type: none"> • The highly active transportation supported by distributors and subdealers supports high-volume use in urban centers with minimal inventory. • Third-party transportation for peripheral distribution to vendors. • Short cash-to-cash cycle.
Hand Lotion	<ul style="list-style-type: none"> • heavy, dense • high turnover 	<p>Cleaning supplies, condoms</p>	<ul style="list-style-type: none"> • Pack sizes tailored to consumer demand. • Centralized, segmented distribution strategy. • Regional specialization. • Mixed loads, delivery truck topping-up model that works for 45 items. • Inventory and transportation

			<p>resources controlled from Kampala.</p> <ul style="list-style-type: none"> • Diverse vehicle fleet reflects the diversity of customers and transportation challenges.
Paracetamol	<ul style="list-style-type: none"> • high turnover, low value • travels in both bulk and mixed loads 	Paracetamol, many generic antibiotics, condoms, many non-drug consumables	<ul style="list-style-type: none"> • Segmenting transportation strategy between high-volume urban customers and small-package customers. • Transportation outsourcing, using a small-package delivery service for small-cube, high-value medicines. • Collecting requisitions and/or inventory information by cell phone or fax.

In March 2008, the JSI Chief of Party Kenneth Ofosu-Barko prepared a matrix of recommendations from five prior assessments conducted between 2003 and 2008 for the NMS Task Force highlighting the fact that the government of Uganda has received a fair amount of technical assistance to identify various opportunities for logistics performance improvement.

Recommendations related to distribution and delivery between the available assessment reports for the most part did not overlap. The follow-up discussions with the MOH at the end of this study highlighted many of the same examples from the commercial sector discussed above. Often they were complementary. However, in one key area, the development of regional distribution points, Euro Health Group Consultants' recommendations (2004) and Medical Care Development International & Serefaco Consultants, Ltd.'s recommendations (2006) were opposite. The former advocated expansion of the central warehouse, and the latter suggested the creation of zonal or regional warehouses (Ofosu-Barko 2008).

As the commercial sector demonstrates, either approach can work—depending on the business model and the number of products involved. Most of the industries favored a regional approach. Importantly, the criteria for establishing regional distribution centers are logistical concerns like road conditions and throughput, not geopolitical divisions. Should the MOH determine to develop a regional distribution strategy, a network design exercise should be used to inform the location and size of the new stores. Network modeling could also be used to model different transportation strategies, including outsourcing options.

CONCLUSIONS

In resource-poor settings, goods flow when there is a demand and an economic interest to supply, but even the most basic goods can still become stocked out. At the village level, retailers have a semi-captive market and there is little local competition or motivation to improve services or to cut prices, but there are also social pressures on local merchants to provide reasonable product availability without price gouging. In the PHC setting in Uganda, economic motivations for assuring services are not the main driver in the health care system, but professional and social motivations still exist as discussed earlier. What we have learned from the commercial sector is that retailers, stockists, distributors, and manufacturers make logistics work so that products reach the customer, sales are made, and profits realized. The health system needs to find a way to make logistics work so that it can meet the ever-growing demand for health services.

While this study did not conduct any new research on public sector distribution, the principal investigator did review a selection of the available literature on public sector logistics to make some comparisons between public and commercial distribution practices. A 2006 logistics system assessment describes the public sector resupply period policy: “MOH health facilities can order essential drugs and contraceptives through the NMS credit line every two months.” The assessment also notes, “A third of the facilities said they placed orders for essential drugs (and/or contraceptives) every two months” (Copeland, Sewagudde, and Bieze 2006). Nonadherence of public sector facilities to the routine ordering policy was described in 2008 in a study by the United Nations Population Fund (UNFPA): “Health facilities on average made only two orders out of the six orders expected in the calendar year 2007” (Kimera and Mohammed 2008).

Copeland et al. also describe the public sector lead time: “The average length of time it takes for facilities to receive ordered supplies varies by the level of facility: the majority of higher level facilities such as 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” (Copeland, Sewagudde, and Bieze 2006). According to the 2007 UNFPA study of six districts, the lead times are actually longer: “On average [in 2007] an order spent 113 days from time of initiation to the time it [was] filled to the time goods are received at the facility. The major delay was at NMS where on average the order spends 76 days before the items are delivered to the district. Order processing at district, which involves endorsement by district officers, also led to an average delay of 14 days. Five days was the average time it took before medicines received at district finally reach the facility.” (Kimera and Mohammed 2008)

The UNFPA report goes on to discuss some of the contributors to the long lead time, including poor communications, lack of reorder forms, late ordering or non-ordering by the health facilities, and inadequate credit for processing an order.

This contrasts with the typical 1-day turnaround for village retailers to fill their requirements from a stockist during a weekly resupply visit or the 4 to 14 days between replenishments for stockists in Lira reported in this study.

Copeland et al. describe the ad hoc transportation strategies used to supply MOH facilities in 2006: “NMS delivers directly to [MOH Hospitals] whereas 73 percent of MOH HC IV facilities stated that

they collect their supplies from the district. . . Only 25 percent of HC III and HC II facilities collect their own supplies; 50 percent rely on the HSD [health subdistrict] to deliver and another 20 percent rely on the district to deliver their resupplies” (Copeland, Sewagudde, and Bieze 2006). While transportation availability through third parties in rural Apac appears weak, it is relatively consistent in the dry season, enabling village retailers to maintain some inventory. Random or inconsistent transport in the public sector may be hurting its ability to plan transportation and deliver goods—which, if so, would likely reduce customer service and increase costs. This could be a promising topic for further study.

Ordering, fulfillment, financing, and transportation are all issues that village retailers and their suppliers must address in order to stay in business. This report made a number of observations about reorder intervals, lead times, distribution, transportation, and even financing of commercial goods.

As stated by the National Federation of Independent Business (2002), “The last mile problem affects virtually every type of industry. Whenever people find solutions to problems that affect their own businesses, they have the opportunity for rapid advancement. There is no monopoly on good ideas or creative thinking.” In Uganda, customers as well as people working at every distribution node are capable of coming up with creative solutions to problems that affect their business. Here are some possible approaches:

Focus on increasing turnover

Village retailers and distributors try to minimize inventory because they are space and capital constrained. The public sector could conduct its own cost-benefit analysis of whether investing in transportation and increasing the frequency of deliveries of smaller quantities to the periphery would improve its operations and supply chain performance.

Third-party transportation

Use of third-party transport is the most typical approach to meet the transport requirement. Village retailers are often very flexible when it comes to mode of transport, using bicycles as well as trucks and taxis. Given contracting and contracts management capacity and tools to ensure accountability at the district level, the public sector could make more use of third-party transport in Apac for distribution to rural health centers. There would be some physical security challenges related to the typical types of vehicles available (open lorries), but these potentially could be overcome by use of locked canteens, tarpaulins, and strict control of issue vouchers and delivery notes at all levels.

No cost data are available to determine whether this would be an economic solution for the public sector in Apac, and these observations cannot be generalized to the whole of Uganda. In addition, there are other options. For example, small-package delivery service from Kampala is not an option used for any of the products in this study, but it is an option that exists. A third-party transport strategy clearly works (in different permutations) for the commercial merchandise in this study. Third-party transport strategies can work in Uganda for delivery of public sector medicines if transport is a senior management priority and if products, customers, and service levels can be clearly defined.

Identify opportunities to pool transportation requirements

There are real costs associated with storage and distribution to the last mile, and village retailers address these independently rather than collectively. The same may be said for rural SDPs operating

in the same transport-constrained setting. One approach to dealing with the health sector's requirements might be to look more holistically at the rural transportation requirement. In "Living in a Walking World: Rural Mobility and Social Equity Issues in Sub-Saharan Africa," Gina Porter (2002) suggests that "community ownership of . . . lorries and smaller vehicles in settlements with basic road access" might be a feasible approach to making transport available in "off-road" settlements. Only a tiny fraction of the capacity of such a vehicle would be needed to support a rural health center. Another strategy she proposes is to "explore the potential for subsidized off-road transport." If these options were available in the rural environment of southern Apac, perhaps a customer pickup distribution strategy could be made to work. Additional research would be required before adopting either of these strategies for wide application.

Use cell phones to improve business communication

Cell phones, which have penetrated this market, are an underused resource for retailers to communicate with suppliers (and vice versa) and organizing and pooling transport. Change may be only a matter of time. The fact that villages have even developed an approach to use dry cells to charge cell phone batteries—an expensive way to recharge—demonstrates the demand for better communication exists. Inexpensive solar rechargers could provide a more efficient solution as well as a source of income for their owners.

Rationalize the number of distribution tiers

There are at least as many distribution tiers in the commercial sector for general merchandise (three to five) as there are in the public health sector. This level of complexity reflects real distribution constraints in the country related to poor transportation and poor information about demand for any organization concerned with responsiveness. The problem in the health sector is that the pipeline is long, which leads to holding a lot of inventory to address uncertain demand.

Shifting the bulk of the inventory and distribution capacity for essential medicines from a central, national store to regional distribution centers would put the inventory closer to the demand. But because data availability is still weak, allocating goods effectively to these regional centers would be extremely difficult. Shifting centralized control to regional distribution centers presents its own challenges, but Mukwano Industries and Nile Breweries have demonstrated the advantages of this approach. However, these manufacturers and their distribution partners have also demonstrated the importance of monitoring consumption (daily and weekly sales), midterm and short-term inventory planning, and responsiveness to consumer demand in keeping inventory levels manageable. Establishing regional stores without adopting corresponding good practices would lead to unmanageable confusion in the public sector. If the MOH decides to rationalize tiers, it would benefit from a network optimization study to make all of its criteria explicit rather than simply trying to emulate a model or perceived best practice.

Conduct outreach in the trade centers

Public health interventions employing mobile outreach like family planning and HIV and AIDS prevention should take advantage of major market days in the trade centers to promote and offer specific services. If the trade center lacks an SDP, leasing space in the trade center pharmacy or other appropriate venue to provide Depo Provera injections, vaccinations, or essential services would benefit the larger community that accesses the trade center. Providing a pickup point for resupplying medications to registered clients for conditions like HIV infection or diabetes could be another application.

Closing the last-mile gap always requires some action on the part of the customer, and it is the local retailer's job to facilitate the closing of the gap by ensuring customer access to both goods and information. Most of the commercial goods available in rural village retail shops are staples required by all households for day-to-day life. Health care is generally less accessible. In the case of condoms, we met two persons in Te-ilwa who ensured their supply weekly: a nursing aide who ran the local commercial clinic and an HIV and AIDS outreach volunteer who distributed free condoms through a support group. Condoms were not available to people living in Accobanok or Oparomo Cell, however, without a trip to the trade center. Retailer and health service provider motivation cannot be taken for granted in assuring availability and customer service, but in the case of southern Apac, social interests also have an impact. Like health workers, the village retailers have a prominent role in village life, and those interviewed expressed the importance of their reputations to their business and community standing. In this way, different motivations drive the supply chain, taking different forms at every level. Although this study did not target health workers, similar forces related to social status are at work—as well as the service provider's personal desire to provide care to the sick. This is, perhaps, an area for additional study. What is clear is that, while very different in scope and motivation, village retail faces many of the same challenges the health sector faces in supplying goods and services to rural communities, and yet manages to provide essential products, most of the time, at a reasonable cost.

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APPENDIX A:

DATA COLLECTION TOOLS

FOCUS GROUP DISCUSSIONS

Materials:

- prepared flipcharts with product tables and pictures of products (at least three per focus group)
- blank flipchart and stand
- markers
- mats for sitting
- samples and examples of products
- tea and cookies
- other gifts (bags of salt).

Meet with parish/village leader, explain purpose of the visit. Organize some drinks and cookies. With permission of local authority, set up focus group outside in some public place like outside a health post waiting area or near a public water pump. Ask passers-by to participate in discussion.

Script for focus group discussion:

Thank you all for agreeing to meet with us today. The U.S. Agency for International Development has organized this study so that we can learn from you about how you get the products commonly used in your homes. We hope that by studying how these products move around the country, that we will learn something that will help us improve the availability of medicines and other products for our health programs, particularly in parts of the country that are challenging to reach. My name is John Durgavich and I live in Washington, D.C. My colleagues are AA and BB who work for XX and YY in Kampala. Before we start, does anyone have any questions for our team? [Brief Q&A]

First of all, I would like to ask you what kinds of products you always try to keep a supply of in your homes. [Note list on blank chart.]

Do you use any of the products on this list? [Show prepared chart with list and labels/pictures of popular products.]

Prepared List of Products Table

Product Category	Products
Personal Hygiene Products	Soap, shampoo, toothpaste
OTC Medication	Paracetamol/acetaminophen/Tylenol
Food	Cooking oil, salt, beer
General Merchandise	Safety matches, laundry soap
Non-drug Public Health Products	Mosquito nets, water treatment tablets, condoms
Other	Cell phone top-up cards

Do you use the products on this list? [Note the name of the parish/village at the top of the chart.] Let's go through the list. Do you use any of these popular products? [List, note numbers of people who use the products.]

Tell me what brands you use. [Write brands next to product name on flipchart, especially if different from identified brands.]

Why do you like these products? Is there something about them that makes them better than similar products? What do you generally pay for these products? [Note responses on flipchart with product list.] Do you think it's a good price?

Can you tell me where you buy these products? Where do you go to buy products? Do you buy the products in the parish, or do you have to travel outside the parish to buy a particular product? Where do you go? [Create a table and list where the products are obtained in the heading and tick whether these sources are used by product.]

If you can buy the product in the parish, who do you buy it from? How far do you have to travel? How long does it take you to get to where you buy this product? How do you get there? If you have to pay some costs for transport, what does it cost? [Note answers on flipchart.]

When you shop for this product, do you also shop for other things at the same location or shop? How many things do you usually buy when you make a shopping trip? [Note responses on flipchart.] How often do you make a shopping trip within the parish?

If you have to travel outside of the parish to buy this product, where do you go? Who do you buy it from? How far do you have to travel? How long does it take you to get to where you buy this product? How do you get there? If you have to pay some costs for transport, what does it cost? [Note answers on flipchart.] Do you feel the travel costs are reasonable? How often do you make a shopping trip outside the parish?

When you shop for this product outside the parish, do you also shop for other things at the same location or shop? How many things do you usually buy when you make a shopping trip outside the parish? [Note responses on flipchart.] What kinds of things?

When you go to buy these products, are they always available? If not, which ones? Why not? Is the merchant ever out of stock? Are merchants out of stock frequently or rarely? What do you do if the product you want is not available? Are there other choices of product you can substitute for the product you like? Do you go home empty-handed?

Can you give us other ideas or suggestions that you think would help us understand the best way to make sure that important products are available to you in the parish? What would help us do a better job?

Do you have any questions for the team?

Thank you very much for your participation today. Please enjoy the tea.

SUPPLIER QUESTIONS

General Merchandise Vendor:

Part I: General

- contact information
- How many products do you carry?

Part II: Distribution

- How many customers do you serve?
- How widely do you distribute? What is your coverage zone? How far away is your farthest customer? Where is that?
- Do you distribute actively? (If so, how many routes?) Or do your customers come and pick up? If both, is one more typical than the other?
- How often do you deliver to your customers? Or how often does a typical customer come to pick up?
- Do customers send an order in advance? If so how? Or do they just come in and pick up?
- How many products do you distribute at the same time on one route? Or How many products does a customer generally pick up at the same time?
- What is the cost of transport for distribution?
- Is transport a separate charge or rolled into the margin?

Supplier-Product Table

Product/Brand	Supplier(s)	Supply Qty	Supply Price	Wholesale Qty	Wholesale Price
Mukwano 3-star 17 kg. jerry can					
Mukwano 3-star 8.5 kg. jerry can					
Mukwano 3 liter jerry can					
Nomi 50 g Sachet					
Mukwano Blue Star 600 g bar, 25 bars/case					
Geisha 45 g bar					
Geisha 125 g bar					
Lifebuoy 125 g bar					
Omo 50 g sachet					
Chapa Blue (Rafiki) 600 g bar, 25 bars/case					
Samona Jelly 60 g jar					
Movit Baby Jelly 60 g jar					
Krishna Matches, pack of 1,000 boxes					
Kay Salt 250 g bag					
Kay Salt 500 g bag					

Suppliers' Data Table

Supplier	Frequency	Requ. / Alloc.	Information Required	Transport mode (Self, Supplier, 3rd Party)	Vehicle Type	Transport Cost	Number of Products in Typical Shipment

APPENDIX B: PRODUCT-SPECIFIC DISTRIBUTION STRATEGIES

This appendix describes the flow of specific goods to the village-level retailer. In the time available, the principal investigator was able to interview Kampala-based suppliers for the following products: beer, laundry soap and soap, cooking oil, airtime cards, lotion, paracetamol, and condoms. In the case of condoms, the social marketing brands and the government promotional brand were the brands identified at the village retail level. Distribution of socially marketed condoms is described separately in appendix C.

BEER

The bottled beer of choice along the north shore of Lake Kwanja is Eagle Extra, manufactured by Nile Breweries. Sometimes it is the only choice and sometimes it competes with other brands, including Nile Special and Club. But Eagle Extra is the brand produced specifically for this target market. Bottled beer is consumed on special occasions such as when a worker receives a cash payment or if there is a celebration of some kind, and price is as important as availability in determining consumer choice. Only one of the three village retailers interviewed stocked beer (none had refrigeration). Beer is more generally sourced by customers at the trade center. A luxury item, bottled beer also competes in the villages with the ubiquitous locally brewed beer (see photo).



Enjoying locally brewed beer
in Apyelemot Trade Center

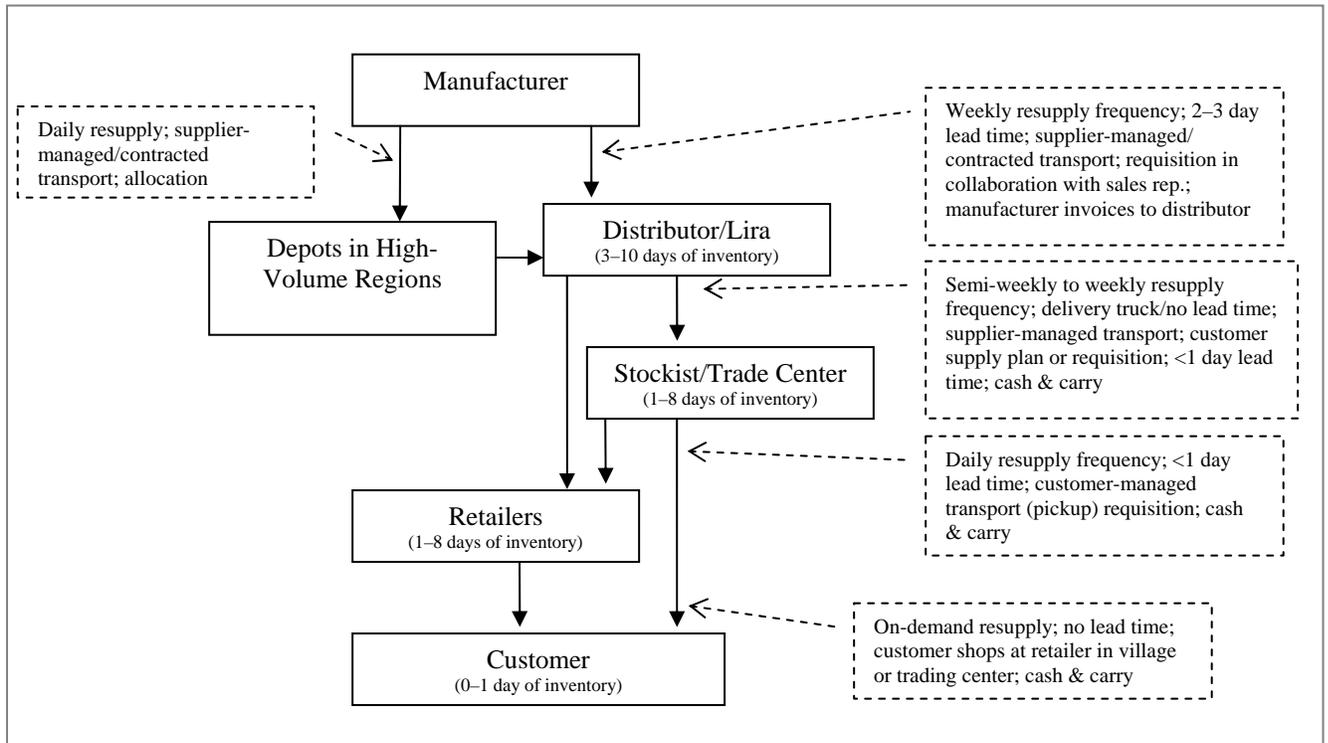
DISTRIBUTION

The flow of beer begins at the manufacturing plant. For Nile Breweries, the plant is in Jinja, a manufacturing town adjacent to Kampala. From the manufacturing plant, beer may go straight to distributors or work its way through depots owned and managed by the brewery. Nile Breweries maintains three brewery-operated depots, serving high-volume regions (Mbalala, Mbale, and Kampala). Beer then travels in full truckloads to independent regional distributors contracted by the brewery. The regional distributors ensure physical distribution to outlets, including bottled beverage stockists in the trade centers and cities and retailers in the cities. Depots and distributors practice “first in, first out” when distributing beer.

Nile Breweries extends credit for up to 10 days to its contract distributors. But the remission calculation is complicated because the brewery, in addition to debiting sales to the contract distributor, must also credit the value of the glass bottles returned. Failure to return bottles can

affect a distributor’s credit limit. Also, if a distributor’s account falls more than 10 days behind, resupply shipments are held until the account is up to date.

Figure 3. Beer in Southern Apac



At the trade center level, none of the retailers interviewed distribute. Customers picked up beer by the crate for resale or by the bottle for immediate consumption. Beer was purchased on a cash-and-carry basis. In the villages visited, most consumers buy bottled beer, by the bottle, in the trade centers. One of the village retailers bicycles to the nearest trade center weekly for a crate of 25 bottles in a trip that combines shopping for other retail goods, buying the beer at the retail price of USh 1,200 and reselling it for USh 1,300 per bottle.

Beer is a highly perishable product with a shelf life of six to eight months when unrefrigerated, and Nile Breweries takes a number of steps to ensure quality. Distributor and depot stocks are monitored daily. Crate limits, based on consumption models, limit distributors to a maximum of 10 days of inventory and stockists, in principle, to a maximum of 4 days of inventory. Contract distributors submit sales data daily, and crate limits are revised quarterly based on sales patterns from these data. Lead time to respond to a requisition is two to three days, which includes picking, loading, transit, and offloading. In addition, “secret shoppers” shop the stockists to test quality, confirm adherence to pricing guidelines, and ensure that expired beer is not being sold.

Beer comes with a bottling date stamped on the bottles, and bottles are collected, recycled, sanitized, and refilled. The target “tube time”—the time between manufacture and return of the glass bottle to the issuer—is 28 days. However, this is a target or average, and in rural areas like southern Apac with its longer resupply periods, the beer may take closer to 16–24 days to reach the consumer. The tube time may be closer to 32–48 days, but still well within the shelf life. In urban Kampala, the tube time is likely to be considerably shorter.

TRANSPORTATION

Beer is generally transported to contract distributors in full truckloads. The 10-ton Mitsubishi Fuso is the workhorse of Nile Breweries' contractors, hauling 800 crates (24 tons) per outbound shipment and up to 800 crates of empty bottles on the return trip. Larger 56-ton trucks are used for inter-depot transportation and to highest-volume areas. Transport is managed by third-party transportation contractors that are paid on the basis of US\$ 2.1 per case per kilometer. Loads are generally single shipments to an individual distributor, but in the rare event that shipments for more than one distributor are consolidated into a single truckload, the transporter is paid for the load as if it was all shipped to the farthest point on the route.

Nile Breweries' local investment policy requires it to use small business contractors, and currently it contracts with 30 different transportation service providers. The small business contractors also tend to be nonunion, so beer distribution has not been known to be disrupted by transportation strikes. There is no regional specialization, and a contracted vehicle may be required to run any route anywhere in Uganda. Nile Breweries considers this an advantage that allows it to spread work equitably across its transportation contractors.

One area where Nile Breweries does consolidate costs and economize is through a bulk fuel purchasing agreement with Shell Uganda Ltd. Nile Breweries maintains a credit account with Shell that allows its transport contractors to draw fuel against the account, and Shell gives Nile Breweries a US\$ 100/liter (about 4 percent) discount against the market price of diesel. Nile Breweries then invoices its distributors for their drawdowns against the account. This is an important service to the transporters because fuel represents roughly 40 percent of their operating costs.

Driver performance tracking is an important feature of beer distribution. Glass is fragile, and drivers get a 0.04 percent transit breakage allowance. The time it takes to run a route and safety issues are also monitored.

All the deliveries to the trade centers visited are made using the distributor's vehicles, operating a delivery truck route, but the Lira distributor also deals with a certain amount of walk-in business. Delivery trucks route to the trade centers in Apac once or twice per week; and a typical small truck, like a Toyota Dyna, can take 200 crates per load over the bad roads in this part of the country.

SOAPS AND LAUNDRY DETERGENTS

There is ferocious competition in the Ugandan market for soap, particularly for laundry detergent but also for hand soap. Hand soap brands observed in the market in southern Apac included Geisha, LifeBuoy, and Imperial Leather. Laundry detergent included the 600-gram bar form of Rafiki Chapa Blue, Mukwano Blue Star, and White Star. Laundry powders included 50-gram sachets of Omo (Unilever) and Nomi (Mukwano). The latter was also available in larger tubs in Te-ilwa, but not in Oparomo Cell or Acobanok. Hand soap is considered a luxury item by some consumers, and consumers in the villages in southern Apac may substitute blue bar laundry soap for hand soap. Soap is retailed by the sachet or by the quarter-bar. Stockouts are infrequent for hand soap, but a recent disruption in raw material supplies from Kenya is considered the culprit behind recent retail-level stockouts of both Geisha soap and Rafiki Chapa Blue.

Laundry soap, in particular, is a volume business. As one would expect, the margins increase as one goes farther down the supply chain, as illustrated in table 7.

Table 7. A Case of Rafiki Chapa Blue

Seller	Buys from	Sells to	Difference
Stockist in Lira	Distributor in Lira for USh 25,200	Vendor in Ayei for USh 25,300	USh 100 (0.8%)
Trade Center Vendor in Ayei	Stockist in Lira for USh 25,300	Retailer in Oparomo Cell for USh 27,000	USh 1,700 (6.7%)
Retailer in Oparomo Cell	Trade Center Vendor in Ayei for USh 27,000	Customer for USh 300/quarter-bar (USh 30,000)	USh 3,000 (11.1%)

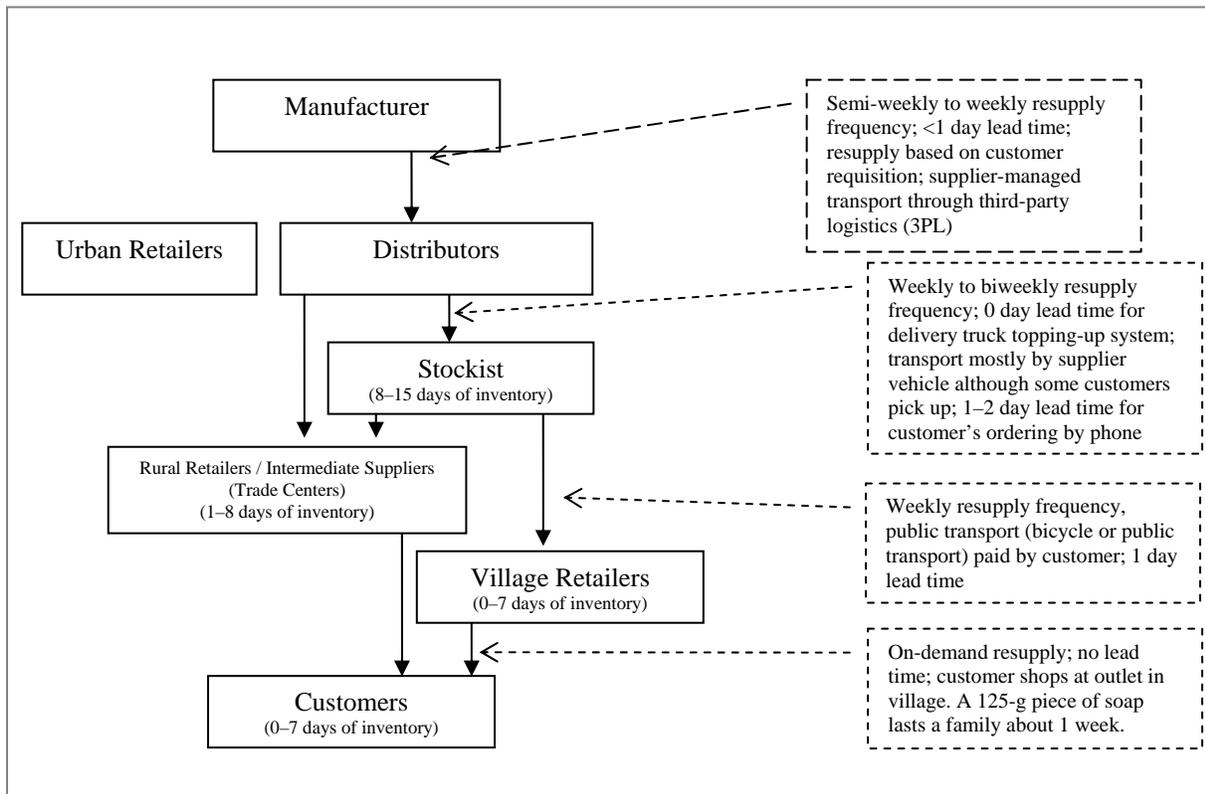
The margin has to cover all of the seller's procurement, transportation, and storage costs as well as his or her profit, so we can use this as a test of reasonableness for the selling price. Hypothetically, if our vendor in Oparomo Cell sells one case of Rafiki Chapa Blue soap per week, he will gross USh 3,000 on the sale. If he rents a bicycle to travel to Ayei for USh 2,000 and picks up eight items, including one case of soap, one can attribute roughly one-eighth of the bicycle rental cost (USh 250) to the soap. He may lose some of his day's sales if some of his customers walk to the nearby trade center at Wigweng, but overall, he will still generate some profit on the transaction. If the vendor pays USh 27,000 for a case of soap, sells that same case for USh 30,000, and incurs roughly USh 300 in costs, his net earnings will be USh 2,700 per case sold. Importantly, he will be able to serve his customers and ensure their loyalty.

Similarly, our trade center vendor might buy 10 cases of laundry soap and pay USh 16,000 for a roundtrip to Lira plus USh 500 per case on the return trip. If our vendor picks up 28 items and we allocate USh 572 to soap, the transport cost for one case is $500 + (572/10) = \text{USh } 557.2$. Rounding this cost up to USh 600, the trade center vendor would still net USh 1,100 on 1 case. Multiply this by the 10 cases he will sell in the week, in addition to the other goods he sells, and the trade center vendor can realize a reasonable profit. Stockists selling hundreds of cases on a cash-and-carry basis and having much lower costs would also expect to profit, even though their margin is smaller.

DISTRIBUTION

The three manufacturers that have penetrated this difficult market are Mukwano Industries, Rafiki Soap Works, and Unilever Uganda Limited. Two of these are based in Kampala. Unilever Uganda distributes 50 product lines through 20 regional distribution partners within Uganda. Mukwano Industries distributes hundreds of product lines (280 through Lira) through 50 channel partners. The principal investigator was unable to visit Rafiki Soap Works in Mbale. The Lira-based distributor stocks only three Rafiki products.

Figure 4. Soap in Southern Apac



Requirements for distributors include covering a specified geographic market, encompassing some or all of four to six political districts, depending on the road network. Distributors must sell at the recommended price and refrain from distributing competing products. Regional distribution partners operate autonomously and make money by collecting a sales commission. Channel partners are regional distributors that have provided a bank guarantee to ensure timely payment against invoices. Manufacturers may also distribute directly to larger service stores, including pharmacies, schools, and supermarkets.

Inventory planning strategies vary. Regional distributors may submit and monitor weekly distribution and/or submit requisitions by either phone or fax. Lead times depend largely on distance, but response times for the two Kampala-based manufacturers are less than one day.

TRANSPORTATION

Manufacturers may combine several products, 50 or so, into one truckload, or they may send full truckloads of a single product. Laundry detergent is high volume and tends to travel in full truckload quantities from the manufacturer to the distributor. Hand soap may travel in mixed loads to the distributors. Both manufacturers interviewed outsource transportation. Unilever Uganda Limited outsources transportation to two or three transport partners; Mukwano Industries owns some of its own vehicles but also outsources to third-party transportation partners.



Preparing a mixed load outside a distributor's

Transport costs are based on distance and tonnage. Manufacturer representatives believe that physical distance and road conditions are the principal challenges in distributing its products in Uganda. The poor road network outside of Kampala increases vehicle wear and tear. For manufacturer-owned and contract vehicles, goods go one way. Typically, the vehicles return empty because there is no good way to control planning and loading of a return shipment of some other good like salt or charcoal, produce like sunflower seeds or cassava, or even passengers. Allowing the driver to plan a return load at his own discretion is considered extremely risky for the vehicle.

Compensation is based on fixed rate for tonnage to a specific distributor (e.g., USh 480,000 to transport 10 tons from Kampala to Lira), but in some cases drivers may have to idle in the yard.

Fuel cost fluctuations also make it difficult for contract transportation agents to budget.

Regional distributors deliver soap, usually as part of mixed loads (see photo), to customers such as stockists using their own vehicles. Some customers also pick up. Stockists, in turn, serve retailers at the trade center and village level. Customers tend to pick up from stockists in southern Apac, but one of the stockists interviewed does offer delivery service for a fee to his larger customers. The village retailers interviewed generally organize third-party transport on an as-needed basis.

COOKING OIL

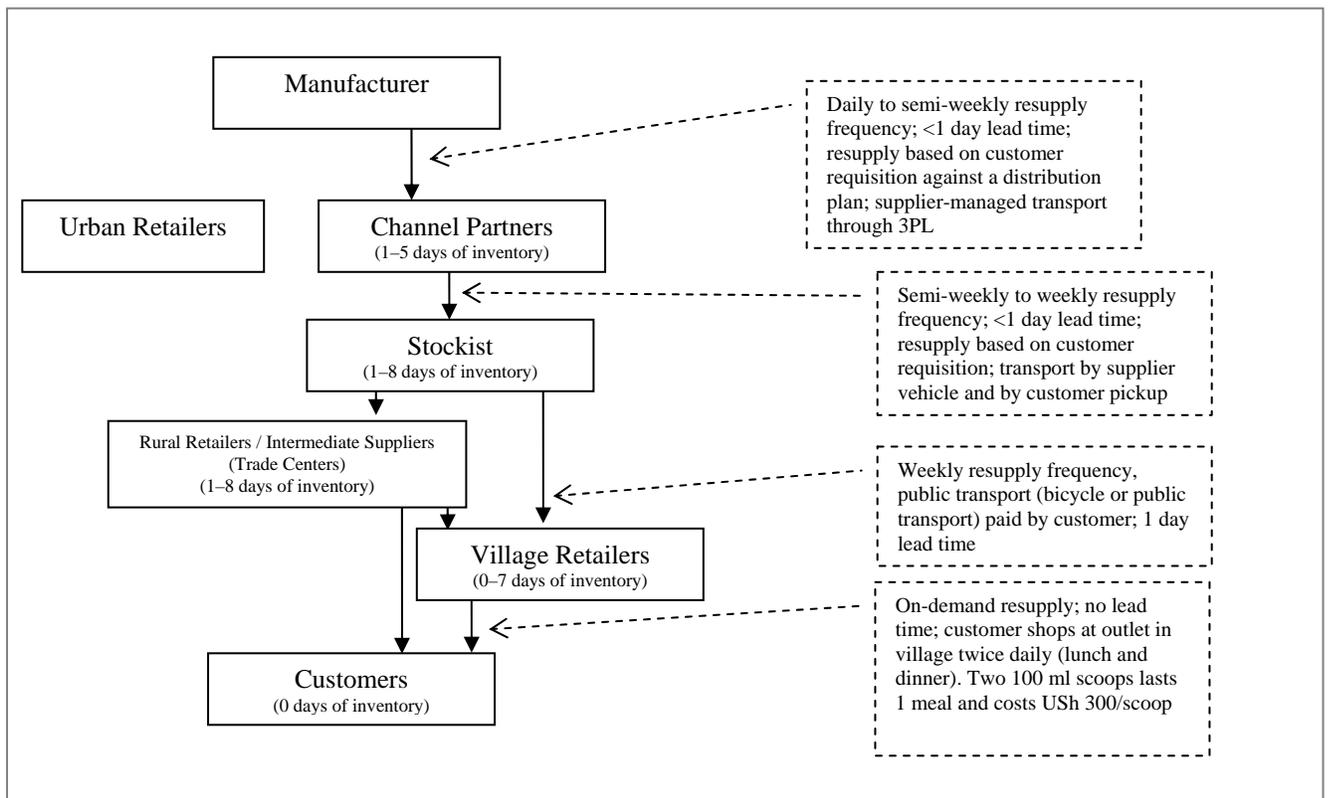
Among the products identified in Apac in the villages along the northern shore of Lake Kwania was Mukwano 3-Star Cooking Oil (typically in 8.5 and 17 kg jerry cans). It was the only cooking oil observed at the village level. The Mukwano Group of Companies manufactures and distributes hundreds of products, including plastic products, edible oils, soaps, and laundry detergents such as the Mukwano Blue Star and Nomi. The Mukwano Group also supports the Mukwano Agro Project, which provides seeds and agricultural extension services, particularly for sunflower seed production (which is the raw material for its edible oil products). In southern Apac, the word "Mukwano" is synonymous with sunflowers and sunflower production. Cooking oil is sold in small units (100 or 140 ml) measured by the retailer into a container provided by the customer. In one case, the team observed a used Mukwano half-liter cooking oil bottle as the customer-provided container, but the team did not observe that unit packaging for sale in the villages. Generally customers bought only what they required for the meal they were preparing (200–280 ml). A staple product, cooking oil will

still become stocked out at the village retail level at times, and there is no substitution. Stockouts were blamed by the focus groups on the failure of the retailer to resupply. The retailer, in turn, blamed lack of reliable transport, especially during the rainy season.

DISTRIBUTION

Cooking oil is considered a Mukwano “core product.” Core products travel in full truckload quantities to channel partners. Mukwano supports about 50 channel partners, that is, third-party regional distributors that have provided a bank guarantee to ensure timely payment against invoices, effectively decentralizing financing for inventory. Channel partners operate independently, requisitioning goods by phone or fax. Mukwano evolved its channel partner model over 21 years of operation in Uganda. Initially, it operated a three-tiered requisition system that went from manufacturer to wholesaler to retailer. From this was developed a system of regional depots. The third iteration involved the establishment of third-party distributors to which Mukwano extended credit, but which in return achieved only a small margin on distribution. The fourth or current iteration engages channel partners that have established bank guarantees to Mukwano, effectively decentralizing financing of the channel partner’s inventory to the partner. Channel partners assume the inventory holding costs and associated risks and in return achieve a higher margin than the third-party distributors did under the earlier distribution strategy.

Figure 5. Cooking Oil in Southern Apac



Channel partners target stockists and large retailers as their customers, principally urban stockists and large urban retailers. The distributor transports cooking oil, generally in mixed truckloads of 10–

15 items, to their customers, although some customers may pick up. The distributor also gives the largest customers up to 15 days of credit. Retailers generally pick up from stockists and transactions are cash-and-carry. Cooking oil is extremely bulky, but also high volume. Because cooking oil is bulky, there is pressure on the supply chain to keep inventories as low as possible. Resupply periods are short—daily to distributors and semi-weekly to stockists.

TRANSPORTATION

Mukwano owns some vehicles, but also outsources a portion of its distribution to third-party transportation service providers. Vehicle sizes range from half-ton pickup trucks to 40-ton trucks. Transportation of cooking oil to Lira is typically done with 40-ton trucks. In Lira, the channel partner uses its own vehicles to transport to its main customers, principally stockists. Retailers make their own arrangements, typically with third parties, for transportation.

AIRTIME CARDS

The airtime business is high volume and managed by requisition and cash-and-carry at all levels. At the central level, the industry is capable of monitoring customer airtime usage by base station as well as sales by distributor, so very good consumption data for forecasting demand and planning purposes are available. Along the north shore of Lake Kwania, two companies dominate: MTN and Celtel. In larger towns in Apac, UTL is also available. Airtime cards are available for sale in one of the three villages visited and all of the trade centers. Cell phone ownership is low. Only 2 out of the typical 40 focus group participants had a cell phone in each village, so demand for airtime cards for individual use is low. Telecommunications companies sell inexpensive phones at cost or at a loss to get customers and close the last-mile gap.

Since none of the villages visited has electricity, cell phones are generally brought to the trade centers to be charged (using car batteries) for a fee of US\$ 500. Cell phone usage is light in rural villages, and a typical charge will last more than one week. In one village, cell phone users use “dry cell technology,” 10 D cells in series, to charge the cell phone battery, although this is a more costly solution. Ten D cells cost US\$ 4,000 and are good for about four charges over a two-month period, so the cost per charge is about US\$ 1,000. On the other hand, this technology is available on-hand and on-demand.



Dry cell technology

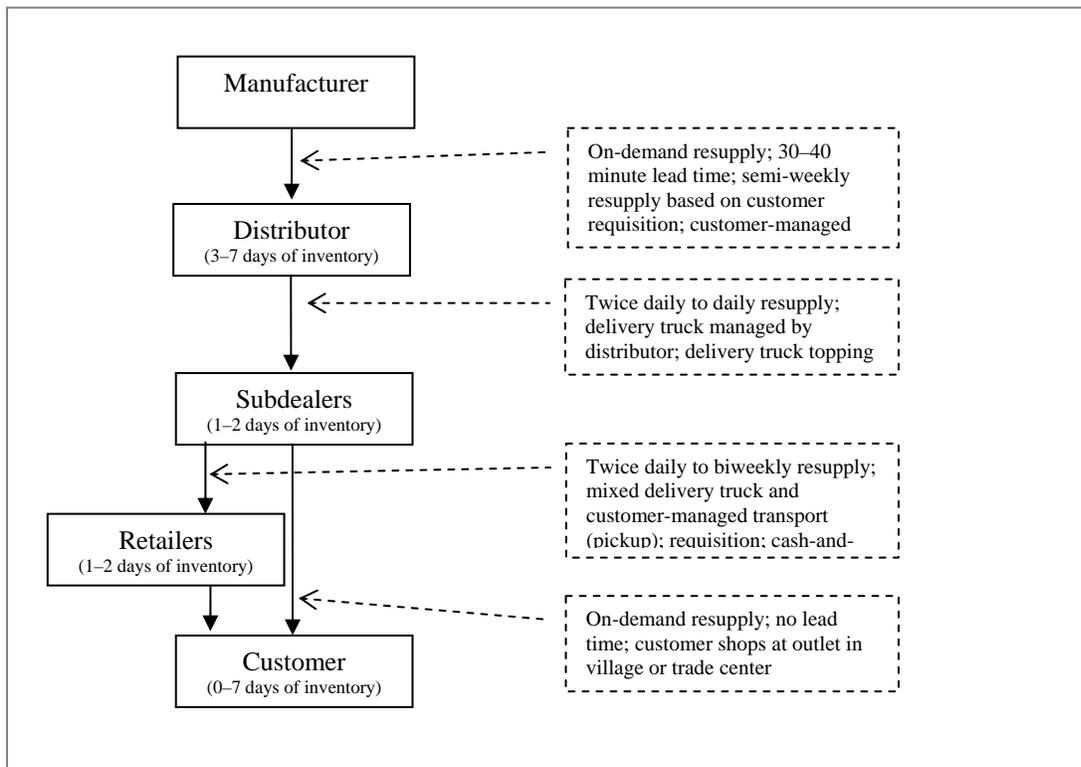
DISTRIBUTION

Distributors or their representatives pick up merchandise from the MTN warehouse in Kampala (processing a requisition takes 30–40 minutes), and distributors manage their own distribution to the subdealers, who in turn manage the distribution to the retailers. Distributors generally carry three to seven days of inventory and resupply themselves daily or semi-weekly. When stockouts do occur, it is always at the level of the rural village retailer because village retailers will not make a 10–15 kilometer trip by foot or bicycle just to pick up airtime cards (small margin and relatively low sales volume in rural areas, compared to very high urban volume). Subdealers generally distribute daily by

motorcycle (delivery truck topping-up model), but as subdealers manage independently, delivery frequency may vary considerably. One retailer in Aduku pays a small fee to a taxi driver to pick up airtime cards from the distributor on a weekly or semi-weekly basis, depending on sales.

According to the distributors, the longest resupply interval is supposed to be one week, but may be every two weeks depending on whether the area is hard to reach. Within a city with high volumes, deliveries or pickups may be once or twice a day for some retailers.

Figure 6. Airtime Cards in Southern Apac



TRANSPORTATION

Airtime cards are the only products in the study where transportation is not supported in any way by the manufacturer. Contract distributors all find their own solutions to move products from Kampala to Lira. None of the three distributors interviewed in Lira use dedicated transport. Because of the small physical size of the cards, distributors can all use some form of public transport like busses or commercial trucks transporting other goods, which are available any day of the week to Lira. One distributor owned and ran a bus company, and so transport costs between Kampala and Lira were effectively zero.

Distributors use their own vehicles or their subdealers' vehicles (generally motorbikes or cars) to deliver airtime cards to subdealers and retailers. In Aduku, one retailer organized his own transport by taxi from Lira for a fee of US\$ 1,000.

LOTION

The lotion brand most frequently identified in Apac in the villages along the northern shore of Lake Kwana was Movit Baby Jelly (60 g jar). This is a brand of petroleum jelly used not just for babies, as the name implies, but also to soothe the dry, cracked hands of people who work in the fields or fish the lake. A popular product, it was available in all three villages as well as at trade centers, towns, and stockists. Focus group participants reported that a 60 g jar would last about four days. Typically one jar is purchased every two weeks or as needed. At the manufacturer level, Movit Products Limited considers its customers to be large retailers and stockists, and all its customers are served from a single hub located in Kampala.

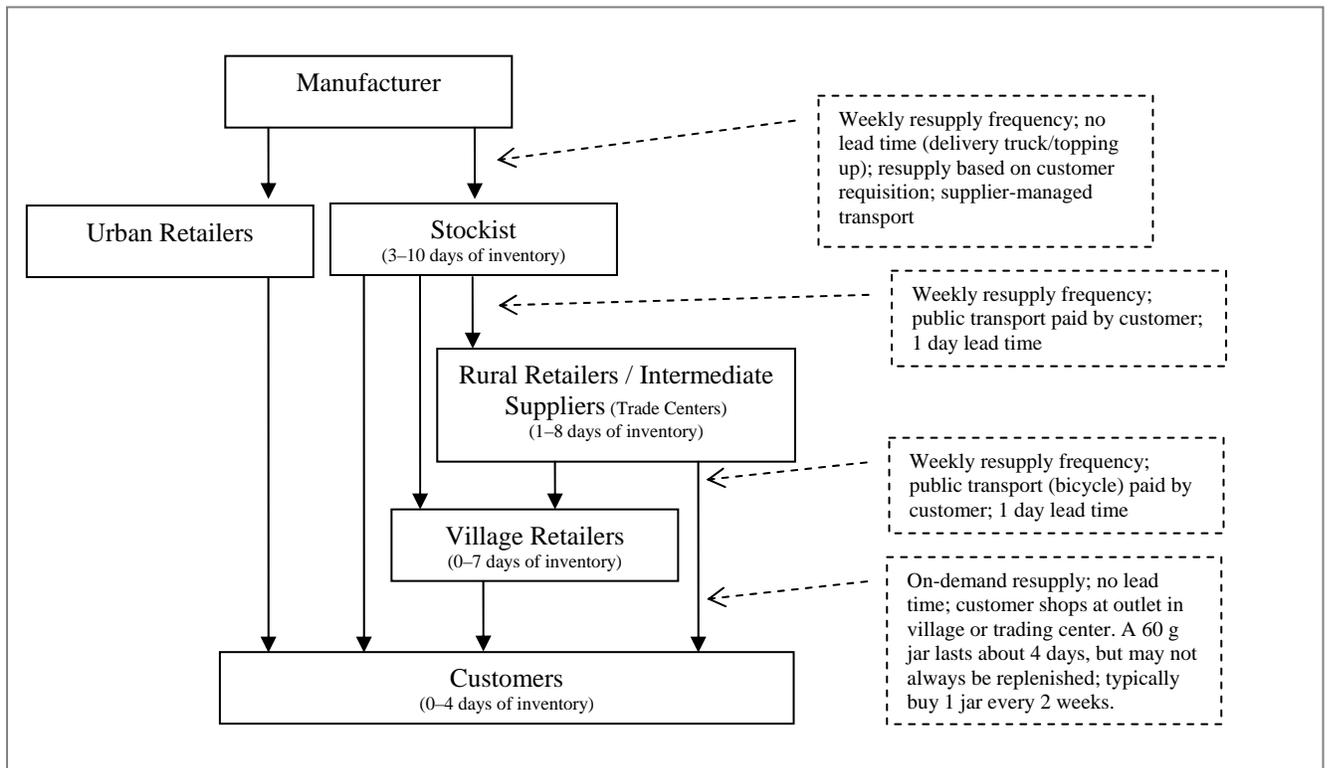
DISTRIBUTION

Movit Products has centralized inventory planning in Kampala. Planning is based on regional sales, and the principal data collection instrument is the Goods Received Note.

Movit Products divides Uganda into five distribution regions for its management and planning purposes. For the purpose of this study, the team was working in Movit's Northern Region, which includes our study district, Apac, as well as Lira and other adjacent districts. Each region has sales and transportation resources based in Kampala. Unlike other manufacturers in the study, Movit Products does not operate regional hubs. All distribution is conducted directly out of Kampala. The principal distribution strategy is delivery truck/topping up, so the general lead time is zero. Vehicles loaded with the 45 product lines visit customers along predetermined routes to deliver products according to customer requirements without advance orders.

Movit Products' cars and trucks travel daily out of Kampala; a customer is typically visited either weekly or fortnightly. The drivers/customer service representatives discuss sales and promote new product lines with customers during these visits.

Figure 7. Hand Lotion/Petroleum Jelly



The manufacturer will take orders by telephone or email, but this is atypical. For such orders, the lead time is one day. There is no such thing as an emergency order in their strategy.

Movit Products has demonstrated that (1) a centralized distribution strategy out of Kampala can be used effectively to service urban centers in Uganda, and (2) a delivery truck topping-up model works for 45 items. The manufacturer also divides its distribution strategy across five geographic regions, even though it maintains its inventory and transportation resources in Kampala.

TRANSPORTATION

Movit Products has made transportation part of its core business and maintains 80 vehicles of various sizes, including five dedicated 15-ton Mitsubishi Fusos (“10 legs”). The director did not provide transportation cost specifics, but said simply that fuel consumption costs were related to the vehicle and the distance traveled for the route. The diversity of Movit’s vehicle fleet reflects the diversity of its customers and the transportation challenges it has in reaching them.

PARACETAMOL

For the purpose of this study, we focused on paracetamol packaged in 1,000-tablet tins, the most common package size of the many different brands. Customers purchase paracetamol by the tablet on an as-needed basis. The village clinic in Te-ilwa reported selling at least one tin of paracetamol, six tablets at a time, in a typical week. A pharmacy in Apac served as the medical supplier.

Paracetamol is one product in the fragmented supply chain that is supplied to both the public and private sectors in Uganda. “Distribution [of medicine] is largely controlled by 8–12 companies; [and because Uganda is landlocked] . . . imported products [including raw materials] often come through neighboring countries first.” (International Finance Corp., 2007),

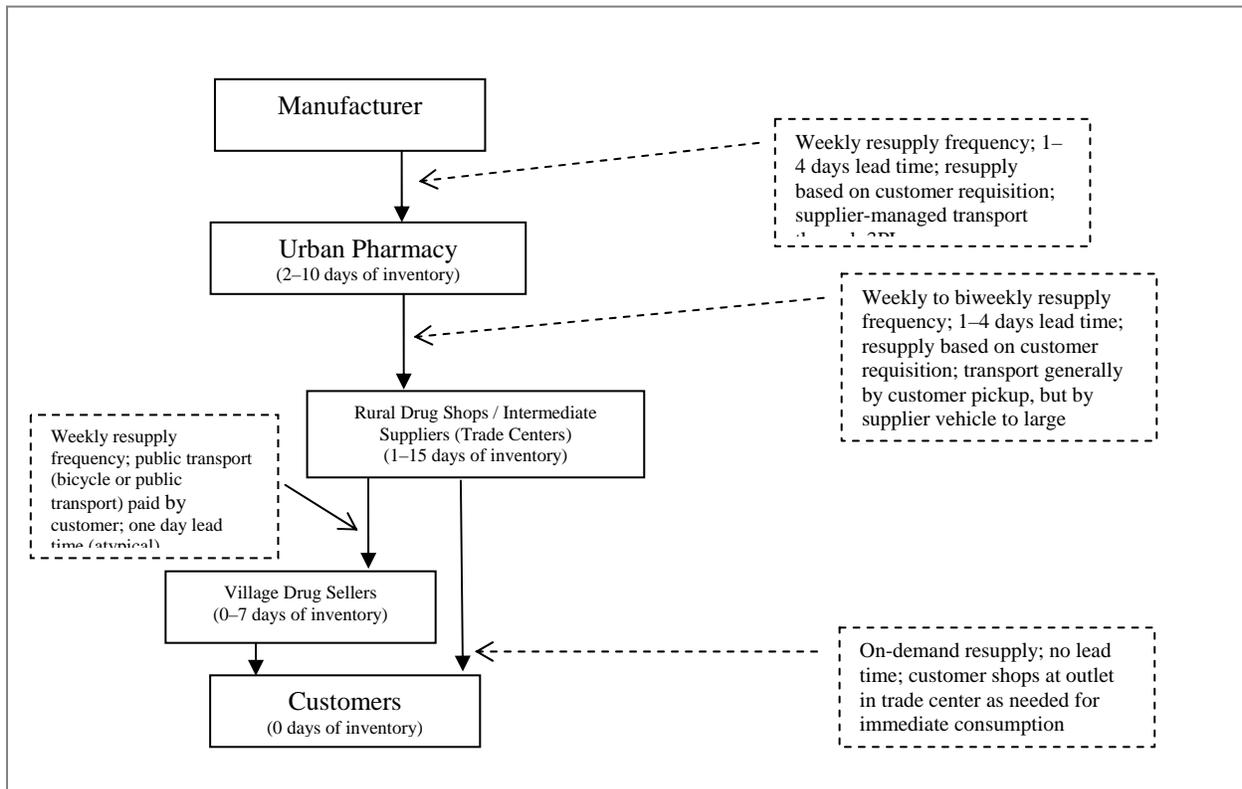
In Kampala, the principal researcher visited Kampala Pharmaceutical Industries (KPI). KPI is a manufacturer of medicine for human consumption, producing 60 million tablets of paracetamol per month, which are sold to wholesalers at about US\$ 3,800/tin. KPI also does repackaging for two socially marketed contraceptives (PilPlan and InjectorPlan) for the AFFORD project.

KPI’s direct customers are primarily 60 large wholesalers but also some hospitals. The bulk of KPI’s business is “make to order.” For example, KPI will plan specific production runs based on large orders from the National Medical Stores, manufacturing and delivering drugs based on customer contract specifications. Typical contracts with direct customers are for two or three products and run six months to one year. KPI generally avoids holding inventory of finished goods.

DISTRIBUTION

Sales of paracetamol are based on customer requisitions. Physical distribution varies greatly. Some pharmacies depend on intermediate medical suppliers in Kampala and send their own vehicles to pick up their requisitions, while some source directly from the manufacturer and receive deliveries, which the supplier outsources to a third-party transportation provider. None of the pharmacies visited had supplier accounts, and so transactions were cash-and-carry or pay on delivery. Large urban pharmacies serve as distributor and stockist for paracetamol and other pharmacy goods.

Figure 8. Paracetamol



The nursing aide that runs the village clinic in Te-ilwa makes a roundtrip to Apac by bicycle once per week to resupply the pharmacy, a 60 km roundtrip that takes a full day. She resupplies nine products on a typical trip. Paracetamol is also the only commercial product in the study sourced in Apac by any vendor. The village retailers in Oparomo Cell and Acobanok do not stock paracetamol.

This product is available at the trade center level, and trade center retailers get their stock from either Lira or the town of Aduku. Consequently, there is no consistency of the geographic flow of these goods and the other products at the village and trade center levels. However, there is some consistency in the sense that shops selling medicines tend to resupply weekly to biweekly, and they all pick up the goods from their suppliers. The urban pharmacies visited in Apac, Aduku, and Lira all source their products from Kampala. At this level, the team found that some suppliers, like KPI, will deliver some products from Kampala to these cities, while other products required a roundtrip to Kampala by the intermediate-level retailer. Vendors at the village, trade center, and even the urban pharmacy reported occasional stockouts of paracetamol, which were associated with spikes in demand or delayed resupply.

At KPI, ordering is done by requisition through a regional sales representative. Customers never pick up. Big customers generally order 15 items at a time, and this was generally corroborated in discussion with the pharmacies in Apac, Aduku, and Lira. One pharmacy showed the team an invoice for an order of 76 different products from one supplier, but this may have been atypical. According to the manufacturer, deliveries are made weekly, but “up country” deliveries may be made every two weeks.

The pharmacies visited in Lira reported ordering monthly. Paracetamol is ordered routinely and is not out of stock in Kampala, and emergency orders for this product are unknown at the manufacturer level.

TRANSPORTATION

Last-mile transportation of paracetamol, as with other products, depends on the village and trade center retailers making a roundtrip to their supplier. What is interesting about paracetamol is that the intermediate suppliers, all sourcing from Kampala, are located in Apac and Aduku as well as in Lira, and can offer the similar bulk purchase prices.

In Kampala, KPI’s transport model is still evolving. It used to manage its own trucks for transportation, but now delivers with its own vehicles only along the most heavily populated route. KPI is slowly upgrading its equipment to support this strategy by replacing one of its two seven-ton vehicles with two box vans for deliveries within Kampala itself.

Outside of Kampala, KPI has contracted with a small-package delivery service provider that carries about 100 shipments (of 15 cartons per shipment) per month. For distant locations, like Gulu, the cost is roughly US\$ 4,000/carton, with rates negotiable for shipments in excess of 150 cartons.

Contractually required metrics for the third-party logistics partner include—

- on-time delivery
- correct products delivered to correct customer
- no products other than human medicine on vehicles used for KPI shipments

This last metric is an important quality control requirement from the pharmaceutical manufacturer’s perspective.

Its small-package strategy should allow KPI to deliver within one week to any urban pharmacy in Uganda with an address and access to a telephone.

OTHER PRODUCTS

The study also looked at matches, salt, toothpaste, and water purification tablets, but these products have not been mapped. Matches and salt are available in the villages, but they are sourced from Kenya, so it was not possible to speak with manufacturers or distributors in Kampala for these products. Toothpaste is available in the villages, trade centers, and at the stockists, but the principal investigator was unable to arrange a meeting with the general distributor in Kampala. The last-mile distribution for these products, as described by the village retailers, strongly resembles the distribution of the other merchandise mapped in the preceding sections. The last-mile distribution depends on the village retailer visiting a supplier at a trade center or in Lira to pick up whatever he or she requires to stay in business.

APPENDIX C:

DISTRIBUTION OF CONDOMS

Unlike the other merchandise in this study, condoms are subsidized by a number of agencies, including USAID and the government of Uganda, as part of the global fight against HIV and AIDS. The team found four brands in the field: Protector, Trust, LifeGuard Pink, and LifeGuard Blue. Many other commercial brands may be available in Uganda, but these four subsidized brands are the only ones found in the rural villages in Apac. Protector is the most well known in the study area and is available in Te-ilwa, Ayabi Trade Center, and urban centers. LifeGuard Pink is available through the community-based distribution (CBD) agent in Te-ilwa. Protector is distributed by the USAID-funded AFFORD project. Trust is distributed by Population Services International (PSI), and LifeGuard Pink is found in public sector service delivery points.

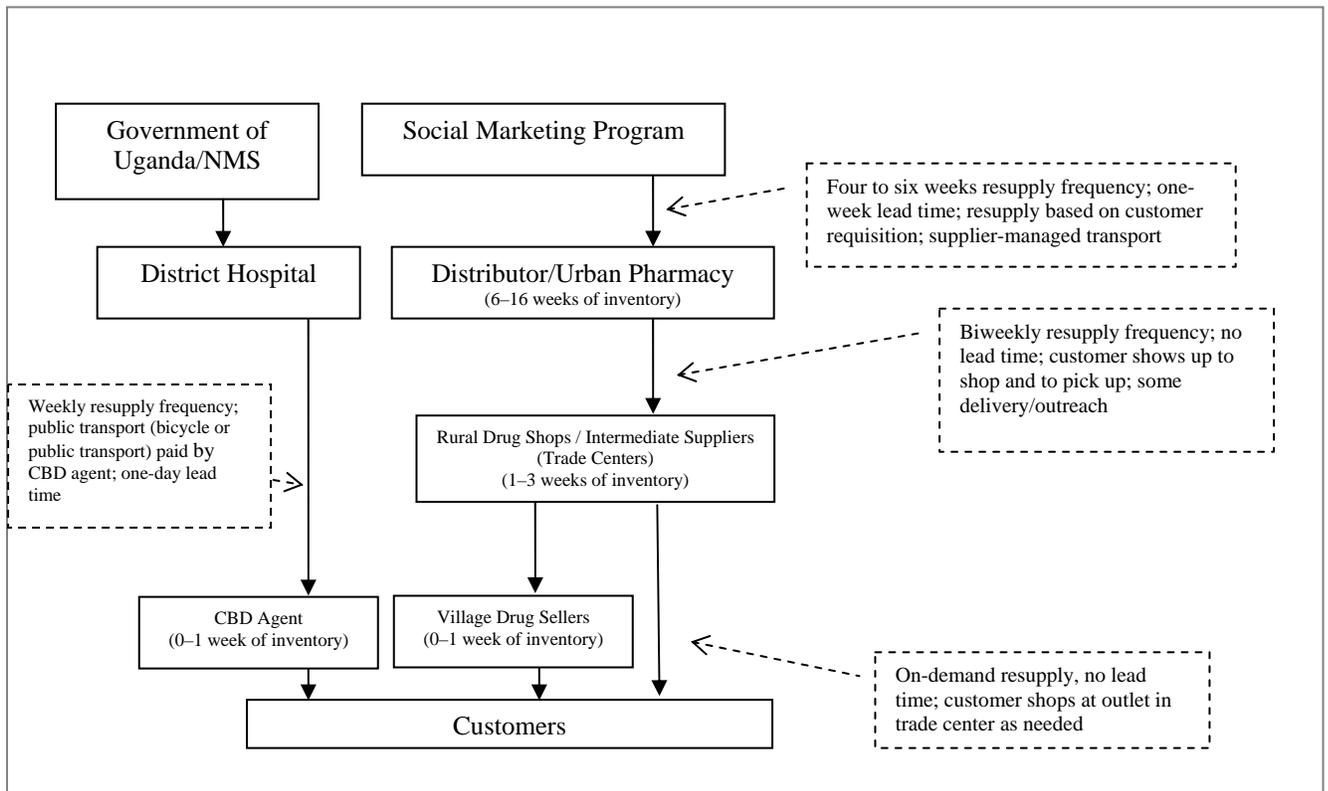
Condoms are available only where there is a drug seller or CBD agent. Te-ilwa has both, but the other two village retailers do not stock condoms. In Te-ilwa, the vendor at the village clinic keeps her Protector condoms in a crate on the floor and does not have them on display due to customer sensitivities. The CBD agent is affiliated with an HIV and AIDS support group and stocks LifeGuard Pink. The typical unit of sale is a packet of 3 at the retailer level or a sleeve of 60 in the urban pharmacies.

Customers and retailers in southern Apac have mixed feelings about condoms. When asked if they buy them in association with any other merchandise, the focus groups told the team that when buying condoms from a retailer, a customer goes in for condoms alone and gets in and out of the shop as quickly as possible. This makes condoms different from other products, which are often just part of a typical shopping list of three to six items. In addition to price, smell is an important quality of condoms; the focus group participants mentioned having problems with a fifth brand, Ngabu, because of the smell. LifeGuard is perceived as “strong,” that is, that it would not break during use.

DISTRIBUTION

As with the other products in the study, pickup and cash-and-carry of condoms are typical at the village and trade center levels. The vendor’s pick-up location depends on the program. The CBD agent travels to Apac to pick up LifeGuard Pink from the district hospital as part of an HIV and AIDS support program. He ensures distribution to other members of his support group and nearby lodges. The nurse’s aide in the village clinic also travels to Apac to buy Protector Condoms from a pharmacy there. Trade center drug vendors source from Lira, but urban pharmacies source from social marketing program detailers who arrange delivery. In Lira, each of the social marketing programs, PSI and AFFORD, has its own local distributor, and they are quite close to each other. Both of these pharmacies retail all the available brands of condoms and serve as each other’s source for the social marketing brands.

Figure 9. Condoms in Southern Apac



In Kampala, PSI/Uganda supports what it calls “indirect” customers for Trust condoms: 12 national distributors. The indirect distribution system follows a continuous-review, minimum-maximum inventory control strategy, whereby distributors place an order when they reach a set minimum quantity forecasted from sales trends. Lead time is about one week and varies according to the availability of trucks. The distributor’s maximum is based on four months of forecasted sales such that orders are required roughly quarterly and require a full truckload. Condoms are heavily marketed.

Distributors buy in bulk at USh 800/30-condom dispenser and, in turn, distribute to wholesalers and trading centers at USh 900/30-condom dispenser. Uganda has hundreds of wholesalers and trading centers; Lira alone has 15 Trust wholesalers. PSI considers distribution and vehicle maintenance one of the major challenges for the distributors. Wholesalers, in theory, sell dispensers for USh 1,000 each, but at this level the vendors are operating independently, and PSI can monitor but not control the price. The actual price per sleeve was twice that at one pharmacy visited. The intention is to make Trust available at USh 200 USh for a pack of three at the retail level, but in practice they sell for USh 300 for a pack of three, comparable to Protector (USAID/AFFORD Project) and LifeGuard (Ministry of Health).

The social marketing programs allow their sales representatives to fax in local purchase orders as needed for direct sales or outreach activities. A number of AFFORD’s vehicles were noted working along the study route between Lira and Kampala.

Each sales representative must have some kind of personal transportation—a car or small pickup truck—capable of transporting several cartons of condoms as well as other socially marketed goods such as bed nets and water purification tablets.

Distributions from Kampala may be monthly or quarterly, depending on the program.

TRANSPORTATION

As with the commercial products, the last mile for condoms is being covered by bicycles and public transport. For bulk transport from Kampala to Lira and other urban centers, PSI maintains two four-ton Toyota Dynas. Cost of transportation to Lira is estimated at US\$ 346,000, which includes US\$ 176,000 for fuel (2,200 liters for a 400 km trip); a one-night driver's allowance of US\$ 70,000; and wear and tear on the vehicle, estimated at US\$ 100,000 per trip.

LAST-MILE IMPLICATIONS

The general awareness of the availability of Protector and Trust brands and the availability of condoms in this difficult market support the idea that social marketing has been effective in reaching at least to the trade center level. High inventory levels, at least in the intermediate distribution tier, seem to be a general problem in socially marketed condom distribution programs. The goods are donated to the programs, and so there may be less control over the supplier than an actual commercial customer would have, particularly in scheduling shipments. Although condoms are heavily subsidized to the customers, programs struggle with transportation funding. The social marketing margins cannot generally support the shorter resupply frequencies that are more typical in the commercial sector, and so the programs are forced to make larger, less-frequent deliveries and hold more stock. In addition, these programs were often designed with high inventory levels when market demand and donor commitment was less sure, and they carry that legacy in their current inventory control strategy. Since the condom market in Uganda is mature and demand is more stable, it may be time to revisit these distribution strategies to identify potential efficiencies.

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

USAID | DELIVER PROJECT

John Snow, Inc.

1616 Fort Myer Drive, 11th Floor

Arlington, VA 22209 USA

Phone: 703-528-7474

Fax: 703-528-7480

Email: askdeliver@jsi.com

Internet: deliver.jsi.com