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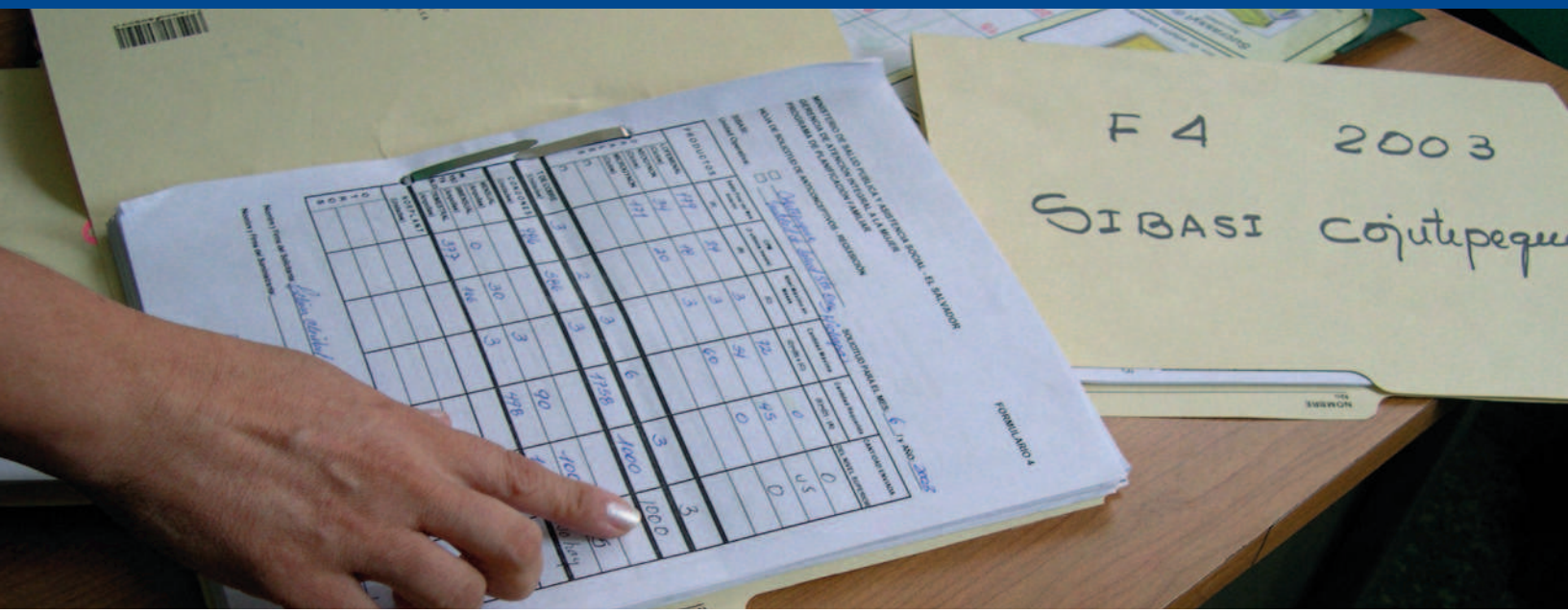
BUILDING BLOCKS FOR INVENTORY MANAGEMENT OF HIV TESTS AND ARV DRUGS

INVENTORY CONTROL SYSTEMS, LOGISTICS MANAGEMENT INFORMATION SYSTEMS, AND STORAGE AND DISTRIBUTION



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DELIVER
No Product? No Program. Logistics for Health

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

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Abstract
Securing a dependable, uninterrupted supply of antiretroviral (ARV) drugs and HIV test kits is critical to the success of HIV testing and treatment programs. Toward this goal, a robust logistics system, supported by sufficient infrastructure, is needed to manage commodities and to strengthen the entire supply chain. ARV drugs and HIV tests, two products that are new to public health logistics systems, have special management needs.

This document focuses on four elements of supply chain and pipeline management: the inventory control system, the logistics management information system, storage, and distribution. These four elements require special consideration in the context of supply chain management of ARV drugs and HIV tests. Luxuries typically built into supply chains, which relieve pressure on those managing the system, may lead to wasted financial and product resources when managing these commodities. Because of these challenges, this paper makes recommendations that follow guiding principles and lessons learned from DELIVER's experience that have proven effective in supply chain management of ARV drugs and HIV tests.

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CONTENTS

ACRONYMS

AIDS	acquired immunodeficiency syndrome
ART	antiretroviral therapy
ARV	antiretroviral drugs
CMS	central medical stores
FEFO	first-to-expire, first-out
HIV	human immunodeficiency virus
HMIS	health management information system
LMIS	logistics management information system
NRL	National Reference Laboratory
PMTCT	prevention of mother-to-child transmission
SDP	service delivery point
STG	standard treatment guidelines
VCT	voluntary counseling and testing
WHO	World Health Organization

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EXECUTIVE SUMMARY

INTRODUCTION

A logistics system that manages any health commodity, antiretrovirals (ARVs), HIV tests, or others, must have the infrastructure to manage and move commodities that support the supply chain as a whole. This document focuses on four elements of supply chain and pipeline management: (1) the inventory control system, (2) the logistics management information system, (3) storage, and (4) distribution. These four elements, in particular, require special consideration in the context of supply chain management of ARV drugs and HIV tests.

While it is highly desirable for all supply chains to be as effective and as efficient as possible, the need for effectiveness and efficiency is even more important when ARV drugs and HIV tests are being managed. Luxuries typically built into supply chains, which relieve pressure on those managing the system, may lead to wasted financial and product resources when managing these commodities. The following discussions and recommendations for managing ARVs and HIV tests assume that the basic elements of a performing supply chain are already in place or can readily be put into place.

When providers do not have consistent supplies of ARVs because of nonfunctioning supply chains, treatment can be severely compromised, given that providers prescribe ARV drugs in combinations that can be toxic, lethal, or ineffective for antiretroviral therapy (ART). In one country, patients were being treated according to the six following combinations of drugs, ***none*** of which were included in the local standard treatment guidelines (STGs) or WHO-recommended STGs:

- ABC/AZT/3TC
- AZT/ddI/NVP
- d4T/3TC/IDV
- d4T/3TC/NLF
- d4T/ddI/NLF
- 3TC/AZT/IND

SPECIAL CHARACTERISTICS OF ARV DRUGS AND HIV TESTS

ARV drugs and HIV tests, two products that are new to public health logistics systems, have particular characteristics that influence how they are managed. Compared to many other essential medicines, ARVs and HIV tests require special handling or adjustments to the supply chain through which they are managed. The special nature of ARVs and HIV tests will influence the design of the inventory control and logistics management information systems and the storage and distribution networks.

SPECIAL CHARACTERISTICS OF ARV DRUGS AND HIV TESTS INCLUDE—

- short shelf life that can range from six to 24 months
- high price, including a significant jump in price when moving from first line antiretroviral therapy (ART) to alternate treatment regimens
- cool storage required for some products
- treatment and testing protocols that require multiple products from multiple sources to be available simultaneously to provide a service
- dynamic technology for products leading to constantly evolving treatment and testing protocols

- higher levels of accountability, including special reporting or other documentation requirements from either donors or manufacturers
- greater potential for redistribution of products from one facility to another
- limited number of sites authorized to use the products
- limited possibility for substitution in the case of stockouts.

SPECIAL CHARACTERISTICS OF ARV DRUGS INCLUDE—

- high value in prolonging survival for AIDS patients
- need for continued, uninterrupted resupply for patients already on ART
- special ordering and information requirements for second line and alternate drug treatment if these drugs are not kept routinely at the service site.

SPECIAL CHARACTERISTICS OF HIV TEST KITS INCLUDE—

- other commodities needed for administration
- kit contents and packaging considerations (e.g., number of tests per kit, inclusion of chase buffer, different expiration dates for tests and buffer).

RECOMMENDATIONS

The following recommendations are guiding principles and lessons learned from DELIVER's experience that have proven effective in supply chain management of ARVs and HIV tests.

INVENTORY CONTROL SYSTEM

- Reduce the length of the supply pipeline.
- Use the forced ordering version of the maximum-minimum (max-min) inventory control system.
- Implement a monthly reporting period and order cycle.
- In a new program, phase in the inventory control system for second line drugs at facilities.
- Implement a mechanism for returning products for rapid redistribution before expiry.

LOGISTICS MANAGEMENT INFORMATION SYSTEM

- Link routine reporting to commodity ordering.
- Avoid overburdening the logistics management information system (LMIS) by collecting excessive service statistics or other data that do not have direct benefit to the management of commodities.
- Always collect and report dispensed-to-user data for ARVs and usage data for HIV tests; do not use issues data as a proxy.
- Refrain from altering the content and formatting of the LMIS to accommodate the funding mechanism.
- Convert quantities to issue of ARVs and HIV tests from units to packs at the issuing level, not the ordering level.

LMIS FOR ARVS

- In addition to the three essential logistics data items, limit the amount of patient data that are collected and reported to the number of new and existing patients by treatment regimen. Use these data for decision making.
- If program reporting captures estimates of new patients, provide worksheets to translate patient numbers into product numbers.
- Select and consistently use one unit for recording drugs.
- Separate clinical/program information used for program monitoring, data collected from logistics, and patient data collected for logistics decisions.

LMIS FOR HIV TESTS

- In addition to the three essential logistics data items, limit other data collected and reported through the LMIS. Do track usage of HIV tests by purpose of use, brand, and use of test.
- Use the individual test as the unit for recording.
- Manage test-related supplies through the existing system for laboratory supplies.

STORAGE AND DISTRIBUTION

- When feasible, integrate the storage and distribution of ARV drugs and HIV tests.
- Provide greater security during storage.
- Ensure increased security during transport.
- Pay special attention to first-to-expire, first-out.
- Ensure product integrity if reissuing returned drugs.
- Deliver ARV drugs and HIV tests to accredited sites only.
- Consider using private or other courier/express mail facilities.
- Ensure that products used together are distributed together.

INTRODUCTION

A logistics system that manages any health commodity, ARVs, HIV tests, or otherwise, must have established infrastructure to manage and move commodities, all of which supports the supply chain as a whole. This infrastructure includes:

- A commodity resupply pipeline
- An information system for gathering and using commodity data
- Storage facilities
- Cool storage facilities
- A distribution system (pickup or delivery), based on the availability of reliable transportation
- Staff/human resources to implement the system.

Inventory management is a vitally important part of the logistics system for ARV drugs and HIV tests, as it determines how stock is managed during ordering, stockkeeping, distribution, and resupply. Inventory management comprises the procedures that govern how these commodities are ordered, received, stored, handled, and distributed to other facilities or dispensed to users at service delivery points (SDPs). The purpose of inventory management is to ensure a continuous supply of quality products to users whenever and wherever they are needed.

This paper focuses on four elements of supply chain and pipeline management: the inventory control system, the logistics management information system, storage, and distribution. These elements require careful management in the context of ARV drugs and HIV tests.

Securing a dependable, regular supply of ARV drugs or HIV tests at service delivery points is critical to the success of antiretroviral therapy (ART) programs and laboratory diagnosis. Any interruption in the supply chain will prevent diagnosis of new patients or endanger the lives of those patients already on therapy due to risk of discontinuation of treatment or development of drug resistance. Frequent interruptions could lead to failure of the program.

The following discussions about and recommendations for managing ARVs and HIV tests assume that the basic elements of a performing supply chain are already in place or can be put into place. Additional requirements or particular application of the basic elements will be needed based on the special nature of ARV drugs and HIV tests.

📖 Refer to ***The Logistics Handbook*** for basic guidance on supply chain design and implementation.

INVENTORY CONTROL SYSTEMS

PURPOSE OF AN INVENTORY CONTROL SYSTEM

An inventory control system informs the storekeeper:

- when to order or issue,
- how much to order or issue, and
- how to maintain an appropriate stock level of all products to avoid shortages and oversupply.

The continuous supply of quality ARV drugs and HIV tests can only be guaranteed through the selection, design, and proper implementation of an appropriate inventory control system. A number of strategies or inventory control systems can be adopted to manage commodities of any kind. Some of these, such as a rationing system, are more appropriate in situations where the product supply being managed, or the financial resources available to purchase the products being managed, is unsure. In a traditional rationing system, supplies are allocated based on some set of chosen criteria, for instance, to serve a certain proportion of the poorest clients, to treat a certain proportion of the priority disease burden in the region, or so that a certain product accounts for no more than a certain proportion of the available budget. However, ARV drugs and HIV tests are expected to be in full supply for a desired target number of patients, at least in the short term. To manage full-supply products effectively, a maximum-minimum inventory control system (also known as a max-min system) is recommended.

MAXIMUM-MINIMUM INVENTORY CONTROL SYSTEMS

FULL SUPPLY SITUATION

Implementation of a maximum-minimum (max-min) inventory control system is most effective in a full-supply situation, where sufficient quantities of all commodities are available to meet all needs, as should be the case for an ART program and some programs that use HIV tests (e.g., voluntary counseling and testing [VCT], preventing mother-to-child transmission [PMTCT]).

A max-min system allows objective resupply decisions based on need and takes into account established levels of safety stock, with the ultimate goal of having product available each and every time it is needed. Given the life-saving nature of ART and the public health risks associated with the emergence of ARV drug resistance, uninterrupted product availability must be the primary concern.

When developing a logistics system, one of the first decisions that will have to be made is the type of max-min inventory control system to use. There are several types of max-min inventory control systems, each of which has slightly different transportation, personnel training, and storage requirements and the other elements that comprise a supply pipeline. Among the available options are:

Forced ordering: Orders are placed at regular intervals; all products are ordered/resupplied to the maximum stock level.

Delivery truck variation of forced ordering: Rather than submitting orders to the supplying facility, service delivery points are visited regularly (the length of the reporting period) by a resupply truck. At the time of the visit, data are collected and resupply quantities are determined and delivered.

Continuous review: Orders are placed each time a product reaches its minimum stock level; products reaching the minimum stock level are ordered/re-supplied to the maximum stock level.

Two-bin variation of continuous review: Bin sizes are determined by the system designers so that one bin equals the estimated consumption for one reporting period. When the contents of one bin has been distributed, i.e., at the end of the reporting period, a new bin is re-supplied to the dispensing facility.

Standard: Orders are placed at regular intervals, but a product is ordered only if it has reached its minimum stock level; products reaching the minimum stock level are ordered/re-supplied to the maximum stock level.

📖 Refer to ***The Logistics Handbook*** for more a complete description and additional discussion of the various max-min systems.

PULL OR PUSH SYSTEM

In any version of the max-min system, the designer must also decide where the decision-making power lies for determining reorder quantities: "pull" if personnel receiving the supplies make the decision, "push" if personnel issuing the supplies make the decision.

Note: Do not confuse "push system" with "rationing." Although push systems have historically been used when commodities are rationed, not all push systems are rationing systems. A true push system can be equally as if not more effective than a pull system if data are accurate and routinely available.

The choice of implementing a push or a pull system will depend largely on in-country capacity at each level of the supply chain as well as the availability of technology. Countries/programs that have well-trained staff at the lower levels (or the potential to train staff adequately at the lower levels) could easily choose a pull system. Countries/programs that rely on more trained staff or the availability of computerized systems at the upper levels, or those wishing to reduce the commodity management workload of lower-level staff, would choose a push system. In either case, adequate information and data have to be available; see Logistics Management Information Systems section for further discussion of this topic.

LENGTH OF IN-COUNTRY COMMODITY PIPELINE

The length of the commodity pipeline (determined by adding the maximum stock levels at all levels of the system) is a key consideration in commodity management. This is especially true for ARVs and HIV tests, where a commodity's shelf life is often less than 24 months and can be as short as six months.

The table below illustrates the inventory control system components of a typical multitiered supply pipeline using a forced ordering max-min system. The numbers represent *months of stock*.

	Lead Time Stock Level	Safety Stock Level	Review Period/ Order Interval	Min	Max	Emergency Order Point
Level						
Central	3	3	6	6	12	3
Regional	3	2	3	5	8	2
District	2	1	3	3	6	1
SDP	1	1	1	2	3	0.5
Total				16	29	

[Min. = lead time stock level + safety stock level]
[Max. = minimum + review period]
[Emergency Order Point = shortest lead time in case of emergency, independent of "normal" lead time]

The type of max-min system (forced ordering, continuous, standard) chosen will affect the length of the pipeline, as will such other factors as lead time and review period/order interval. The longer the pipeline, the longer it takes for commodities to move from the central-level supplier to the client, the more safety stock will be required in the system, and, if linked to resupply, the longer it will take data to move from the lower levels to the upper levels.

The more effective and efficient the elements of the supply chain (transportation system, order turnaround time, etc.), the more effective and efficient the supply chain, and therefore, the shorter the pipeline can be. In a system for managing ARVs and HIV tests, supply chain effectiveness and efficiency must remain a top priority.

SPECIAL CHARACTERISTICS OF ARV DRUGS AND HIV TESTS THAT AFFECT THE SELECTION/DESIGN OF AN INVENTORY CONTROL SYSTEM

ARV drugs and HIV tests both have unique characteristics that often require that they be managed differently (with greater control, with greater care, using a different system) than other commodities. Managing them may require establishment of a vertical supply chain or, at a minimum, special handling within an integrated or other combined supply chain. Special characteristics of ARV drugs and HIV tests include—

- short shelf life, which can range from six to 24 months
- high price, including a significant jump in price when moving from first line to second line treatment regimens
- high value in prolonging survival for AIDS patients
- treatment and testing protocols that require multiple products from multiple sources to be available simultaneously to provide a service
- limited possibility of substitution in the case of stockouts
- high risk of drug resistance in the case of stockouts.

Due to these unique characteristics, it may not be possible to integrate them fully into existing inventory control systems. For instance, holding large quantities of stock in inventory at the various levels requires more money and storage space and increases the risk of pilferage, damage, and expiration. In any case, the characteristics of ARV drugs and HIV tests require additional system resources over and above those required for a typical supply chain as noted above.

Inventory control system requirements for ARV drugs and HIV tests include—

- shortest possible pipeline
- lower buffer stocks than other health commodities
- more frequent reporting period and order interval.

Removing one or more levels from the distribution system for commodities does not necessarily mean removing that level for other program-related purposes such as supervision. In fact, lower-level personnel can play a critical role in overseeing program activities, monitoring product availability, and providing feedback on reporting or other issues, often more quickly and more effectively than can central-level personnel.

In view of the logistics system design elements and the key considerations already discussed, DELIVER has developed some basic recommendations for designing and implementing an inventory control system to manage ARV drugs and HIV tests.

RECOMMENDATIONS FOR ARV DRUG AND HIV TEST INVENTORY CONTROL SYSTEM DESIGN AND IMPLEMENTATION

The following recommendations for ARV drug and HIV test inventory control system design and implementation will achieve pipeline efficiency while addressing the special commodity management requirements of ARV drugs and HIV tests.

1. REDUCE THE LENGTH OF THE SUPPLY PIPELINE.

If ARVs or HIV tests must be managed within an existing supply chain/pipeline, reduce the length of the supply pipeline. If ARVs or HIV tests are to be managed through their own vertical pipeline(s), design the pipeline(s) to be as short as possible.

From the illustrative pipeline seen in the table above, it is clear that a pipeline of 29 months is too long to manage ARVs and HIV tests, many of which are delivered in-country with about 75 percent of their shelf life remaining. Each level in the pipeline necessarily implies safety stock kept at each level, with the potential of tying up valuable financial resources in stock quantities.

In addition, in countries where the number of ART and HIV testing sites is limited, if ARVs or HIV tests are moved through an existing pipeline, regions and/or districts would be required to stock products that are distributed to only a few sites in that region or district.

Strategies for reducing the overall length of the supply pipeline are listed below. It must be noted that strategies to reduce the pipeline must be selected based on the in-country situation and resources. Adopting a strategy that affects one element of the supply chain will have an impact on other system elements, and the operation of the supply chain will be adversely affected if an one element is not strong enough to perform under the new requirement.

- **Eliminate an entire level or levels from the supply chain.** This is the single most effective and most common strategy for reducing pipeline length. Intermediate levels such as regional and/or district levels are usually eliminated, and commodities move directly from the central level to the service delivery points. From the example in the table above, eliminating the district level alone would reduce the overall pipeline to 23 months; removing the regional level alone would reduce the overall pipeline to 21 months; and removing both the regional and district levels would reduce the overall pipeline to only 15 months. While this results in storage and distribution savings at these levels, it does require more resources for transportation at the central level. However, as the number of ART or HIV testing sites is generally limited, the additional central-level resources required for distribution are usually fewer than those required to maintain secure storage and distribution for ARVs or HIV tests at all intermediate storage facilities.
- **Shorten the order interval at one or more levels.** While this will reduce the pipeline length by reducing the maximum stock level, it will require more frequent reporting and ordering, which may place a burden on service providers and require more frequent transportation, for example, monthly pickup/delivery instead of quarterly. Further, care must be taken that **the lead time does not exceed the reporting period** for placing and receiving an order.
- **Reduce the lead time.** Overall pipeline length can be reduced by reducing the amount of time it takes to fill and process orders and deliver product to the receiving facility. Of course, this increases pressure on personnel and transportation resources. Automation of data collection, reporting, analysis, and order processing can also help to reduce lead times.

- **Maintain lower levels of safety stock.** Safety stock is kept primarily because of uncertainty about the system's ability to provide routine service. If uncertainty can be reduced, for instance, if suppliers consistently provide timely delivery, if customs clearance formalities are reduced or eliminated, or if communications and transportation within the country are very reliable, the safety stock level can be reduced and both minimum and maximum stock levels can be reduced.

2. USE THE FORCED ORDERING VERSION OF THE MAX-MIN INVENTORY CONTROL SYSTEM.

In light of the special requirements for ARV drugs and HIV tests, and to take advantage of some of the common characteristics of ART and HIV testing programs, the forced ordering version of max-min inventory control system has several key benefits, including—

- The range/number of commodities is relatively limited/low, so all commodities can be ordered at each reporting period.
- If ordering is linked to reporting, forced ordering will require that all facilities submit a report/order at each order interval, so facilities that are not reporting and/or not ordering can be identified easily.
- Reorders are standardized and limited to a regular cycle, reducing some of the burden on transportation. (This system entails less frequent orders and deliveries than does a continuous review system.)
- This version requires less safety stock than the standard version.
- The simple ordering decision rule makes it easier to implement.

Depending on the number of ART and HIV testing sites being served, the reliability of transportation, the size of the country, and other factors, the delivery truck variation of forced ordering max-min is the best inventory control system for ARV and HIV test distribution. While the delivery truck variation of forced ordering max-min does put pressure on distribution planning and transport management, it has benefits in addition to those of the forced ordering system noted above. These include—

- Higher level of security: supplier vehicles can be upgraded to ensure secure cargo areas rather than retrofitting service facility vehicles for the task.
- Immediate data collection: data are collected at the moment the vehicle arrives at site; there is no delay due to data transmission so resupply decisions are based on very timely data; and there is less risk of the data/information being lost in transmission.
- Lead time is negligible, thus shortening the pipeline.
- Relieves service providers of logistics duties: data collection, resupply, etc., are done by the delivery team.
- Centralizes transport needs: dedicated vehicles assure supply deliveries so individual sites do not need to arrange for transportation of commodities.
- Excess product close to expiry can be collected for immediate redistribution to other sites; expired product can be collected for disposal.
- If a supervisor accompanies the delivery, on-the-job training and some supervisory activities can take place at the time of the delivery.

3. IMPLEMENT A MONTHLY REPORTING PERIOD AND ORDER CYCLE.

A monthly order cycle limits the amount of buffer or safety stock that facilities need to hold. If ordering and reporting are linked, a monthly order ensures that program managers receive data frequently, which is especially important when expanding services. Monthly ordering and reporting allows program managers to monitor the quantities and range of products being used more frequently. Because logistics data can indicate changes in treatment regimen, timely availability of this data will allow program managers and national-level commodity managers to respond to changes in product requirements and adjust procurements.

It is important to note that, for a monthly reporting period to operate effectively, the lead time for filling an order must be less than one month.

If a monthly ordering and reporting cycle is not possible, the next shortest cycle should be implemented. If a quarterly or greater reporting period and order cycle must be used, then it should be limited to the upper levels or, in any case, to as few levels as possible.

4. IN A NEW PROGRAM, PHASE IN THE INVENTORY CONTROL SYSTEM FOR SECOND LINE DRUGS AT FACILITIES.

Starting patients on ART is never an emergency, and switching patients from a first line to a second line treatment due to failure is not widely seen as a clinical emergency. Given that second line drugs generally are significantly more expensive than first line drugs, and that in new programs demand for these drugs is slow, managing second line drugs slightly differently from first line drugs can help a program reduce costs and waste. Rather than stocking all facilities with supplies of second line drugs, these products can be stored centrally until a facility requires them and then provided only to those sites with patients on second line drugs. After the drugs become a regularly managed product at the facility, they can be managed alongside first line drugs at the facilities that require them.

5. IMPLEMENT A MECHANISM FOR RETURNING PRODUCTS FOR RAPID REDISTRIBUTION BEFORE EXPIRY.

Despite strict adherence to stock management procedures, a facility may, at some point, find itself overstocked with ARV drugs. Overstocks may be due to any number of reasons, including slower than expected uptake of new patients, higher or lower than anticipated shifts in treatment regimens, or higher than expected rates of treatment abandonment.

In a system with monthly reordering (two-month maximum stock level), if a facility has more than two months of supply, then the overstock should be returned to the supplier so those products can be redistributed and used before they expire. For systems with different maximum stock levels, drugs would have to be returned to the supplier early enough to ensure that they can be reissued and used by the patient before expiry.

A special transaction record should be used to facilitate and track the return of ARV drugs and HIV tests from a lower-level facility to a higher-level facility. This record will identify the products being returned and provide proof of return by the lower-level facility and proof of receipt by the higher-level facility. See the illustrative form *Report for Returning Products* in the annex.

LOGISTICS MANAGEMENT INFORMATION SYSTEMS

PURPOSE OF A LOGISTICS MANAGEMENT INFORMATION SYSTEM

In all programs and for all product categories, logistics managers at all levels need to make routine decisions that affect commodity availability. They need to determine how much of each product to order or resupply, to forecast future demand for a product, and to plan procurements and commodity shipments. They also need to be able to identify potential supply problems at facilities or storage sites or to handle other issues related to commodity management. These decisions must be made using accurate and timely logistics data that is provided by a logistics management information system (LMIS). Over the long term, data provided through the LMIS can also help inform policy and product selection decisions.

An LMIS helps personnel collect and manage the information necessary to support sound and objective decision making in managing the supply chain; the goal of this decision making is to ensure an uninterrupted supply of commodities and to identify any problems in the supply pipeline. The LMIS is composed of all the forms and documentation used to maintain records and produce reports on the logistics system.

Do not confuse HMIS with LMIS. HMISs are intended for the collection and reporting of overall program parameters, such as incidence, client load, and performance, and lack the specificity that LMISs provide for managing commodities within the health program. In addition, the time required to collect and process data through an HMIS would mean that it is not available for timely logistics decision making.

An effective LMIS makes regular and timely information available to decision makers. Information is used to make short-term resupply decisions in the and to make long-term procurement and program management decisions. The need for timely and accurate commodity data increases when there is a rapidly expanding program, as is the case for HIV/AIDS programs, where demand for services and client uptake is highly unpredictable.

LINK BETWEEN THE LOGISTICS MANAGEMENT INFORMATION SYSTEM AND THE INVENTORY CONTROL SYSTEM

An LMIS and the inventory control system have a close relationship: the LMIS provides the data required to maintain the inventory control system.

Data collected through the LMIS enables a product manager to determine how many months of stock are currently kept at the facility; knowing this, the product manager will know if the supply is above, below, or within the established maximum and minimum stock levels, or if he or she needs to make an emergency order. At the end of the order interval, the product manager will compare current stocks to maximum stock level and place an order for the appropriate quantity needed to bring stock levels to maximum.

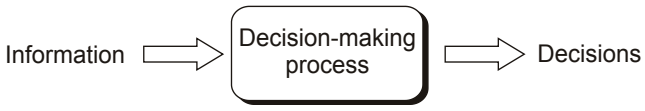
Upper-level commodity managers can use the LMIS to track trends in overall consumption and adjust national level procurements, as needed. They can identify overstocks of ARVs or HIV tests and redistribute the products. Commodity managers can also use the data to determine exceptionally high levels of product expiry, and then initiate action to prevent this situation from happening in the future.

LMIS data can even help program managers identify incorrect prescribing or dispensing practices or detect unusually high rates of treatment failure at a particular site or in a region. This can result in targeted supervision and, thus, improve the overall quality of care for HIV/AIDS clients.

DATA FOR DECISION MAKING

A key underlying principle for all LMISs is that data collected and organized will provide a sound basis for decision making. This requires that relevant data be collected at appropriate locations in the logistics system, be processed, and be transmitted to decision-making points, in a timely and complete manner. Additionally, decisions must be based on reliable data, so care must be taken to ensure data integrity, to avoid duplication, and to collect only the data that are actively used for decision making.

Collect data only if it will be used for making decisions!



Logistics systems for all commodities should include at least three essential data items:

Dispensed to user are the data on the quantities of products given to clients/patients for their use (e.g., ARVs) or the quantities of products used by the service provider (e.g., HIV tests, which are not actually given to the clients). In some systems or for some product categories, issues data are used instead of dispensed-to-user data. Issues data refers to quantities of products that are sent from upper-level facilities to lower-level facilities.

Stock on hand are the data on the usable quantities of stock held at a facility.

Losses and adjustments are the data on any quantity of stock that leaves the pipeline for reasons other than dispensed to user—transfers of stock from one facility to another at the same level, expiry, or damage.

While using issues data as a proxy for dispensed-to-user data may be acceptable in general essential medicines programs, the level of rigor and accountability required of HIV/AIDS programs makes this practice unacceptable for managing ARV drugs and HIV tests. In addition, concerns for the security of ARVs from therapeutic, safety, and financial perspectives impose greater demands for accountability.

Other data may be included in an LMIS; however, an LMIS must not be so extensive that it becomes a burden on the health care personnel who implement the system or who try to collect data that are not immediately relevant for logistics management decision making. An LMIS must collect only data that will be used for decision making. Data collection forms and reports must be used to collect and transmit the data; it must also be easy to use.

The logistics data that are collected and reported will be used to answer a number of questions, including—

- How long will available supplies last; do we need to order more supplies now?
- Where are our supplies in the pipeline; do we need to move supplies from higher to lower levels or between facilities at the same level?
- Where is consumption the highest? Do those facilities need more resources?
- Are we experiencing losses from the system that require us to take action?
- Are supplies flowing regularly through the pipeline? Do we need to adjust the pipeline to account for bottlenecks in the system?

RECORDS AND REPORTS

As mentioned earlier, the purpose of a logistics system is to collect and process data to support decision making. Three kinds of logistics records are typically used to collect data at the points at which the commodities are managed. These records, which correspond to the three essential data items, include—

- *Consumption* records that capture data about the products being used or dispensed (usage logs or dispensing registers).
- *Stockkeeping records* that collect information about products in storage (bin cards, stores ledgers).
- *Transaction records* that collect data on the movement of stocks from one point to the other (requisition and issue vouchers, waybills).

In addition to the data collection records, an LMIS must include reports. Reports represent the mechanism through which logistics information is communicated from one level of the system to another. While records are used mainly to collect primary data, reports typically include processed or aggregated data. The format of the report, and the data required, is driven by the types and frequency of the decisions to be made, based on the report. Generally speaking, reports will include consolidated or aggregated consumption, stock on hand, and losses and adjustments. These data will be transmitted from the lower levels to the upper levels of the supply chain.

Because of the link between inventory management and LMIS, many systems use a combined LMIS report and order or request form. The advantage of combining the reporting and ordering functions using the same form is that the data for calculating the order are readily available on the form. If the inventory system is a pull system, the person completing the report calculates the order; if it is a push system, the order quantity can be calculated and completed by the supplying facility, using the information in the report. Experience from other programs has shown that linking reporting and ordering encourages timely submission of reports.

In addition to the reports that move up the system, feedback reports are often used to provide information from the higher to the lower levels of the system. In this way, lower-level facilities can gain an appreciation of how the work they do fits within the overall system and see how lower-level operations can be improved.

Assuming that ARV drug or HIV test pipelines are shorter than the pipelines used for moving other kinds of commodities, as was recommended in the earlier Inventory Control System, the amount of data aggregation will be reduced. This will also reduce the risk of introducing errors into the reporting system and will help to ensure that data continue to move regularly and rapidly through the system.

AVAILABILITY OF DISAGGREGATED DATA

As data move from the lower levels to the upper levels, some data elements may be aggregated. For instance, a team of service providers at a facility may submit a total figure at the end of the month that shows the number of drugs dispensed. In this case, the facility would report only the total number, not the number of drugs dispensed by each individual service provider.

As the data move higher through the system, however, care must be taken to ensure that upper-level decision makers have access to disaggregated data, because this data are needed for their decision making. For instance, it might be useful for ART or VCT/PMTCT program managers to know the total of all products and/or regimens dispensed in all sites/facilities, or the total quantity of products held at all sites/facilities. But for purposes of supervising the logistics system and overseeing distribution of products among the districts, the program managers would need to have the data disaggregated by service delivery point (SDP).

📖 Refer to ***The Logistics Handbook*** for more a complete description and additional discussion of logistics management information systems.

SPECIAL CHARACTERISTICS OF ARV DRUGS AND HIV TESTS THAT AFFECT THE DESIGN AND IMPLEMENTATION OF A LOGISTICS MANAGEMENT INFORMATION SYSTEM

While an uninterrupted supply of commodities is desirable for all health programs, ARV drugs and HIV tests present unique challenges. Unlike some other medicines, one ARV cannot easily be substituted for another. In addition, the requirement that different ARVs be used in specific combinations necessitates that these products be monitored both separately and in combination. Furthermore, ART cannot be interrupted and continued later due to the unavailability of drugs. Any failure in the supply chain to make ARVs and related supplies available at all times could lead to catastrophic outcomes, including death, treatment failure, and development of drug resistance. Like ARV drugs, there are no substitutes for HIV tests after specific testing protocols have been established for each test purpose; chase buffer from one test kit cannot be used with a different kit. An HIV test protocol may require the use of up to three different tests, all of which must be available to provide clients with reliable test results.

ISSUES OF PARTICULAR CONCERN IN ARV DRUG AND HIV TEST MANAGEMENT, ALL REQUIRING ACCURATE AND TIMELY INFORMATION

- need for simultaneous and uninterrupted availability at service delivery points of multiple products with different shelf lives from different suppliers to provide quality ART and HIV testing services
- higher levels of accountability, including special reporting or other documentation requirements from either donors or manufacturers
- greater potential for redistribution of products from one facility to another.

ISSUES OF PARTICULAR CONCERN IN ARV DRUG MANAGEMENT, ALL REQUIRING ACCURATE AND TIMELY INFORMATION

- continued uninterrupted resupply for patients already on antiretroviral therapy (ART)
- special ordering and information requirements for second line and alternate drug treatments, if these drugs are not kept routinely at the service site.

ISSUES OF PARTICULAR CONCERN IN HIV TEST MANAGEMENT, ALL REQUIRING ACCURATE AND TIMELY INFORMATION:

- ensured supply of all tests and test-related consumable supplies for testing protocols
- kit contents and packaging considerations (e.g., number of tests per kit, inclusion of chase buffer, different expiration dates for tests and buffer)
- testing protocols (serial and parallel testing).

As with the inventory control system, it may not be possible to fully integrate the LMIS used to manage ARV drugs and HIV tests with the LMIS used to manage other health commodities. Certainly, a vertical system for managing ARVs, or a vertical system for managing HIV tests, would require its own vertical LMIS.

At the program management level, for program planning, quantification, and procurement planning, often additional, nonessential logistics information may be needed for effective decision making. This additional information cannot be compiled from logistics data, but must come, instead, from patient and program data that should be collected routinely through the health management information system (HMIS) established for the HIV/AIDS program. Ideally, logistics managers should have access to information available through the HMIS to facilitate program planning and routine supervision. However, in the absence of a well-functioning HMIS, some (but not all) of these data elements should be collected through the LMIS.

Following is a sample list of the types of additional information useful to logistics managers for program planning. Some of the information comes from primary data and some is calculated from primary data.

ADDITIONAL INFORMATION USEFUL FOR ART PROGRAM MANAGEMENT:

- number of patients who access ART services and receive drugs
- ARV combinations and regimens
- changes in overall use of regimens over time (calculated data)
- rates of patients substituting single drugs due to toxicity or weight gain (calculated data)
- rates of patients switching regimens (calculated data)
- changes in pediatric regimen due to weight gain, intolerance, toxicity, or treatment failure
- number of sites that dispense ARVs
- number of patients on each regimen at each facility
- correlation between the number of patients and the quantities of drugs being consumed.

ADDITIONAL INFORMATION USEFUL FOR HIV TESTING PROGRAM MANAGEMENT:

- number of clients/patients who access VCT or PMTCT services and are tested
- number of tests used, by purposes of use, brand, and use of test
- accounting for test-related supplies.

RECOMMENDATIONS FOR ARV DRUG AND HIV TEST LOGISTICS MANAGEMENT INFORMATION SYSTEM DESIGN AND IMPLEMENTATION

1. LINK ROUTINE REPORTING TO COMMODITY ORDERING

There are many benefits to linking routine reports to commodity orders. For example, a system with monthly reporting and monthly ordering has inherent advantages over a system with monthly reporting and quarterly ordering. Often, commodity managers may ignore reporting that does not produce a tangible benefit or result, which is in this case, receiving commodities that result from an order linked to a report. Other advantages to linking reporting and ordering are—

- Supervisors can verify more easily that order quantities are realistic, using the data that are reported (consumption, stock on hand, number of patients by treatment regimen).
- Commodity managers will not focus on orders to the exclusion of reports.
- The relationship between the data in the reports and the commodity orders is reinforced; reported data are used for decision making.

While some might argue that "no report, no commodities" would penalize nonreporting facilities, it is crucial to remember that the data contained in the reports drive the entire system and ensure adequate commodity orders and procurement for the entire country. Facilities that do not submit their reports regularly and on time jeopardize commodity availability and the system as a whole and, therefore, quality of care. Given the public health risks associated with treatment interruption of ART, linking ordering and reporting has proven to be an acceptable solution. However, policymakers or relevant authorities should always be involved in approving this decision.

See the illustrative forms, *LMIS Report and Request for Antiretroviral Drugs* and *LMIS Report and Request for HIV Tests,* in the annex.

2. AVOID OVERBURDENING THE LMIS BY COLLECTING SERVICE STATISTICS OR OTHER DATA THAT DO NOT HAVE A DIRECT BENEFIT TO MANAGING COMMODITIES.

Other data that are not required for logistics purposes may be included in the LMIS for HIV tests or ARVs, depending on the needs of the particular program's existing information systems and logistics system design. The LMIS may be required to capture additional types of data, such as service statistics and epidemiological data, which are often needed by different HIV/AIDS program managers. These types of data can ultimately help in making logistics-related decisions, such as forecasting. Reporting formats should not collect any data that do not benefit commodities management.

3. ALWAYS COLLECT AND REPORT DISPENSED-TO-USER DATA FOR ARVS AND USAGE DATA FOR HIV TESTS; ISSUES DATA SHOULD NOT BE USED AS A PROXY.

While the use of issues data as a proxy for dispensed-to-user or usage data may be acceptable in general essential medicines programs, the level of rigor and accountability required in ART programs makes this practice unacceptable for ARV drug and HIV test management. In addition, concerns for the security of ARVs and HIV tests from a therapeutic, safety, and financial perspective impose greater demands for accountability.

4. REFRAIN FROM ALTERING THE CONTENT AND FORMATTING OF THE LMIS TO ACCOMMODATE THE FUNDING MECHANISM.

The landscape of supply chain management for ARVs and HIV tests is marked by the presence of multiple donors operating with different agendas, program objectives and goals, and reporting requirements. These often competing agendas may put pressure on the respective LMIS used to manage the products, with the contents or data items included on the LMIS determined by the funding mechanism. However, aside from the few exceptions noted above, the logistics data needed to run a system does not change significantly over time: logistics data are logistics data. However, funding mechanisms constantly change. If an LMIS is designed to respond to the needs of one donor, it will need to change if that donor withdraws support and is replaced by another. Data collected on the LMIS forms should suit the particular program needs and be used for decision making; they should not, however, be dictated by individual donor requirements. If funding mechanism reporting requirements are so specific as to require additional data or information, then those data or that information should be collected and reported separately, not within the LMIS used for commodity management.

5. QUANTITIES TO ISSUE OF ARV DRUGS AND HIV TESTS SHOULD BE CONVERTED FROM UNITS TO PACKS AT THE ISSUING LEVEL, NOT AT THE ORDERING LEVEL.

Programs frequently procure drugs from multiple suppliers. Thus, pack sizes of drugs and HIV tests frequently change. Depending on the number of funding and procurement sources that exist in a program, a central warehouse can have multiple brands of the same ARV drug in stock at the same time, some of which may be packaged in different pack sizes. In a pull system, where facilities calculate order quantities and send these to the issuing facilities, it is strongly recommended that the ordering quantities be recorded and submitted as basic units (e.g., tablets, capsules, individual number of tests). This will allow the issuing facilities to convert the units into pack sizes based on what they have in stock and following sound warehouse practices (such as first-to-expire [FEFO]). Also, this is likely to reduce errors that might occur if the issuing facility received orders in inappropriate pack sizes, had to convert them back into units, and then reconvert them into packs based on their existing stocks.

RECOMMENDATIONS FOR ARV DRUG LOGISTICS MANAGEMENT INFORMATION SYSTEM DESIGN AND IMPLEMENTATION

1. IN ADDITION TO THE THREE ESSENTIAL LOGISTICS DATA ITEMS, LIMIT THE AMOUNT OF PATIENT DATA THAT ARE COLLECTED AND REPORTED; AND TRACK THE NUMBER OF NEW AND EXISTING PATIENTS BY TREATMENT REGIMEN. USE THESE DATA FOR DECISION MAKING.

To make informed program-wide decisions related to commodity use—forecasting, scale-up of programs, or other medium- or long-term planning—commodity managers, program managers, and others at the higher levels require information on the number of patients/clients by regimen, in addition to the logistics data. These data may be collected through LMIS reports or other routine HMIS reports. Unlike other public health programs that strive to meet the needs of most if not all potential clients, ART programs usually can treat only a specified number of patients, so these data help managers monitor the numbers of patients under treatment and changes in regimen over time and forecast quantities required for future procurements.

Patient data may be best collected by ART service providers, rather than by commodity managers. In this case, the service provider and the commodity manager have to work together to complete a single report that contains data from each.

Therefore, it is necessary for the LMIS, which generally focuses exclusively on logistics data, to also collect limited elements of patient data. To correctly determine product resupply quantities, particularly when buffer stocks are not maintained, LMIS reports should include the total number of products needed to treat patients, in addition to dispensed-to-user,

stock on hand, and losses and adjustments data. (See description below and sample forms in the annex.)

For many health commodities, consumption is relatively stable over the short term and may increase or decrease gradually over the long term. In such a situation, the three essential data items noted earlier are sufficient for making commodity management decisions. This would also be the case for an established ART program using a forced ordering max-min system with frequent resupply and sufficient levels of safety stock for all drugs required. For example, with monthly ordering, a two-month maximum stock level should provide enough stock to serve existing and new patients.

Using logistics data alone within the max/min system, and assuming monthly reorders and a three-month maximum stock level (one month of dispensing stock, one month of lead time stock, and one month of buffer stock against uncertainty), order quantities would be determined using the standard formula, as follows:

*It is vital to use ***average monthly consumption*** when determining order quantities once such data are available. This is particularly true in cases where the dispensing protocol may call for giving patients more than a review period of supply. In such cases, month-to-month consumption will vary greatly, and the average consumption must be captured.

Conversely, if you are only using the previous review period dispensed to user, and not an average, then you cannot give more than a review period worth of stock to patients, as doing so would lead to stockouts.

Quantity to Order =

(Average Monthly Consumption* x 3) – Stock on Hand

In a rapidly expanding program, however, the addition of new patients may exceed the system's capacity to maintain adequate stock levels. For example, if a program is more than tripling the number of patients on ART each month, then a three-month max calculated using average monthly consumption over the past three to six months would not be enough to maintain product quantities for new patients. One strategy is simply to increase the maximum and minimum stock levels (add an additional two or three months of additional buffer against *uncertainty*). This may be a difficult solution in some countries because of the high additional cost this would entail. Another strategy—considering the patient data—combines logistics data with patient data to determine reorder requirements. In this case, patient-related data, specifically the estimated number of new patients by treatment regimen for the next month, is required. After the estimated number of new patients is known, then the drug requirements for those new patients can be determined and added to existing dispensed-to-user logistics data for calculating order quantities.

Using patient data combined with logistics data, and assuming monthly reordering with a three-month maximum stock level (one month dispensing stock, one month lead time stock and one month safety stock), order quantities would be determined using the following formula:

Quantity to Order =

(Consumption* x 3) + (Quantity required for new patients x 3) – Stock on Hand

In a situation when a program cannot fund normal levels of safety stock, then the minimum (and maximum) stock levels must be reduced. For example, a program may decide to use a two-month maximum instead of three months. This would provide enough stock for one month of consumption, three weeks of lead time stock, and a one-week safety stock. Using patient data combined with logistics data, order quantities would be determined using the following formula:

Quantity to Order =

(Consumption* x 2) + (Quantity required for new patients x 2) – Stock on Hand

Note: In this example, with a two-month maximum (one month of dispensing stock + one month of lead time and safety stock); *lead time must be three weeks or less.* This example is referenced in the sample LMIS forms in the annex.

It should be noted that the combined use of logistics data and patient data results in a much more complicated set of calculations to determine resupply quantities. If patient data is being used to project reorder quantities, then it is strongly recommended that a computerized system be used to make those calculations. Further, if a computerized system is being used, then it is likely to be used more effectively in a pull system situation.

2. IF PROGRAM REPORTING CAPTURES ESTIMATES OF NEW PATIENTS, PROVIDE WORKSHEETS TO TRANSLATE PATIENT NUMBERS INTO PRODUCT NUMBERS.

In addition to the three types of logistics records mentioned earlier, an LMIS for ARVs might include a register or other record specifically designed to collect patient information, such as number of patients per treatment regimen, that will provide the additional patient information required to manage ARV drugs.

Logistics data collected through an LMIS for ARV drugs come from basic logistics records, such as stockcards and dispensing logs. The information from those sources reflects only past consumption/product use. To estimate future quantities of products needed, during the next order cycle, for instance, facility staff will need to translate the number of patients who will be served into the quantities of products that will be needed to serve those patients. For this purpose, it is suggested that a worksheet be developed and implemented that guides service personnel in calculating those product quantities. The worksheet would include the number of new patients by treatment regimen and a mechanism for determining the number of drugs required for each regimen and for calculating the total quantity of each drug needed for all expected new patients. This information would then be transferred to the report and order form. (See the annex for a sample worksheet, *Worksheet for Calculating Monthly ARV Drug Orders for Estimated New ART Patients.*)

In addition to being a useful tool for ordering, the worksheet can be used for monitoring and supervision. Periodically, program managers can use the worksheet to monitor ARV drug use by cross-checking and comparing the number of patients being served and the quantities of products being requested. Because some drugs are used in multiple regimens, the worksheet could also aid program managers in monitoring prescribing and dispensing protocols.

3. SELECT AND CONSISTENTLY USE ONE UNIT FOR RECORDING DRUGS.

As with all drugs and other medical supplies, data collected on LMIS records (dispensing registers, stockcards, etc.) should be recorded in the smallest unit distributed to clients. For most drugs the recorded numbers represent numbers of tablets or capsules. Because of the large volumes of drugs dispensed to treat HIV, if an ART program is consistently dispensing drugs to patients as full bottle amounts (i.e., one bottle of syrup or one bottle of tablets is equivalent to a one-month supply), and the package quantities will not be changing, then the bottle can be chosen as the unit for recording.

However, standard logistics practice uses the smallest possible unit (tablet, capsule, ml, etc.), and the program should seriously consider following that practice, given that bottle quantities vary by supplier and can change over time. This is particularly important when tracking of paediatric solu-

> Zerit is packaged in bottles of 56 tablets, while generic versions of stavudine are packaged in bottles of 60 tablets. All other drugs used in combination with stavudine to make a full regimen (such as efavirenz, lamivudine, and nevirapine) are also packaged in bottles of 60 tablets. A program that only tracks number of bottles would run the risk of patients receiving four fewer tablets per month in a regimen. Similarly, when new patients are started on a nevirapine-based regimen, they only receive half the standard dose to test for toxicity and thus receive 14 or 15 tablets for their first two weeks instead of the full bottle of 30 tablets. Tracking by bottle would make it difficult to account for this dispensing practice.

tions. For example, nevirapine oral suspension is available in 20 ml, 100 ml, and 200 ml bottle sizes. If all bottle sizes are stocked at the central warehouse and supplied based on what is in stock, and if LMIS reports only capture logistics data by bottle, tracking usage and calculating resupply quantities will be difficult, if not impossible. Tracking liquids using ml as the basic unit will allow resupply calculations to be made accurately, while considering bottle sizes in stock. The important point is that the recording unit is consistent, and that it is known and used by all program personnel.

4. SEPARATE CLINICAL/PROGRAM INFORMATION USED FOR PROGRAM MONITORING FROM LOGISTICS AND PATIENT DATA COLLECTED FOR LOGISTICS DECISIONS.

As discussed earlier, when managing ARV drugs, some patient data are needed to inform resupply and other commodity management decisions. Such data, however, are often not readily available through an HMIS or other information/data-gathering system. Thus, the tendency might be for the burden to fall to the LMIS to collect and report such data regularly and frequently.

It is tempting to use the LMIS to collect other patient or program data; it is simple to add additional data collection columns to the LMIS forms and reports. However, doing so can easily create situations where the logistics data are *lost*, either by having reports pass through program managers before going to commodity managers or by making the data collection process so cumbersome that the logistics information is no longer collected and reported in a timely way. In any case, there is the risk that collected data are not available or used for resupply, which is the main purpose of the LMIS.

Certainly, it is important to collect and use information on aspects of the ARV program aside from commodity management, such as monitoring patient adherence to their treatment regimens, toxicity rates, rates of first line drug resistance, and so forth. However, a separate system should be used for collecting and using this information. In fact, medical or program personnel should be monitoring these aspects of the program through their own reporting mechanisms not logistics/commodity managers through the LMIS.

RECOMMENDATIONS FOR HIV TEST LOGISTICS MANAGEMENT INFORMATION SYSTEM DESIGN AND IMPLEMENTATION

1. IN ADDITION TO THE THREE ESSENTIAL LOGISTICS DATA ITEMS, LIMIT OTHER DATA COLLECTED AND REPORTED THROUGH THE LMIS; AND TRACK USAGE OF HIV TESTS BY PURPOSE, BRAND, AND USE OF THE TEST.

HIV tests can have multiple purposes of use: for PMTCT, clinical diagnosis, VCT, and blood safety, among others. In some countries, health workers manage separate registers for different purposes of testing and then aggregate each of these registers to report on a total number of HIV tests dispensed, according to purpose. The LMIS for HIV tests may be used to track quantities of HIV tests used by purpose, brand, and use of the test. Capturing these data has significant benefits for program management, especially for monitoring program expansion and forecasting future needs.

The information is also useful from a supply chain management point of view. The donation or procurement mechanisms for each of the testing purposes may vary, and maintaining purpose of use data can help determine individual requirements during forecasting and with separate reporting requirements. Also, experience has shown that the information summarized by *use of test* (i.e., screening, confirmation, etc.) can be very beneficial for resupply, especially in rapidly expanding programs. These programs may experience supply imbalances, which could force facilities to use non-standard tests to obtain HIV test results. For example, if facilities have been stocked out of screening or confirmatory tests and have substituted the tie-breaker for that reporting period, the program manager can use the number of tests used for screening, confirmation, and tie-breaker rather than the number of

In Ghana, there are separate ledgers for each purpose (VCT, PMTCT, quality control, etc.) for HIV testing. The information from the ledgers is used to complete summary reporting.

tests by brand to ensure correct supplies of each brand are issued after the supply situation is corrected.

Logistics data can also be supplemented by a limited amount of patient data. The availability of such data can tend to increase the accountability of the number of HIV tests used. Additionally, such data can contribute to long-term forecasting by showing trends in proportions by purpose, such as VCT, PMTCT, or clinical diagnosis. However, capturing data other than logistics data—for example, the numbers of clients served—is a decision that program managers should make; but the program managers must recognize that limited data should be collected to avoid making the system cumbersome or unwieldy. Data should never be collected if it will not be used for decision making.

See the forms in the annex, *Daily Log for Usage of HIV Tests* and *LMIS Report and Request for HIV Tests.*

2. USE THE INDIVIDUAL TEST AS THE UNIT FOR RECORDING.

Logisticians and program managers must agree on the unit of recording used to manage HIV tests based on kit contents and packaging. It is recommended that the HIV tests be recorded by test, rather than by kit. Also when a site is stocked out of its preferred screening test, it may use another brand temporarily to screen clients until the original brand is resupplied. For example, a facility may use a low number of HIV tests but be unable to use an entire HIV test kit (which may include 100 tests) before the tests expire or the facility stocks out of chase buffer but still has several tests left. The facility does not need an entire test kit, just more chase buffer. In either case, the commodity manager needs specific information on the number of tests, not the number of kits, to take the appropriate action. This is only possible when the unit of tracking is the test, not the kit.

3. MANAGE TEST-RELATED SUPPLIES THROUGH THE EXISTING SYSTEM FOR LABORATORY SUPPLIES.

One common challenge regarding test-related supplies is managing reagents and other consumable laboratory supplies, such as lancets, pipettes, blood collection devices, and gloves. Tracking such supplies, which are used in HIV testing separately from those used for other purposes, would demand more time from service providers, create more room for error, and not provide significant program benefits.

The only exception would be if there is no established supply chain for laboratory consumables. In this case, such products could be included in the LMIS for HIV tests to ensure their availability for HIV testing.

📖 Refer to ***The Guidelines for Managing the Laboratory Supply Chain*** for a more complete description.

STORAGE AND DISTRIBUTION OF ARV DRUGS AND HIV TESTS

PURPOSE OF STORAGE AND DISTRIBUTION

The purpose of a storage and distribution system is to ensure the physical integrity and safety of products and their packaging as they move from the central storage facility to service delivery points and into the hands of the clients/patients. A sound storage and distribution system will help ensure that products reach the client in usable condition, with a minimal loss or waste.

Proper storage procedures help ensure that storage facilities issue only quality products and that there is little or no waste due to damaged or expired products. When all levels of the pipeline follow appropriate storage and distribution procedures, clients can be assured that they have received a quality product.

> In Kenya, the National AIDS program began with a distribution system of delivery straight from the central level to the service delivery point. Two years into the program, as more than 90 sites were on board and transportation and resources had trouble coping, the system was redesigned to introduce delivery from the central to the district level, with the service delivery points collecting from the districts.

Acceptable storage facilities (warehouses, storage rooms) are clean and secure, and adequate distribution systems have dependable and secure delivery vehicles. It is desirable for the pipeline to be as short as possible. In the context of storage and distribution, a shorter pipeline can have a positive influence on the security and quality of the products being distributed. Having fewer levels in a system means fewer storage points and fewer instances of transporting products. Limiting the number of times products are transported reduces opportunities for product damage to occur. There are also fewer people handling the products, which can help to increase accountability and minimize loss, damage, and pilferage.

PACKAGING

While the major focus in storage and distribution is on the products being moved, the packaging of the product should also be considered. The packaging provides the primary protection to the product during storage and transportation. The quality of the packaging should be specified during procurement, and sufficient, sturdy packaging materials should be available for repackaging products for distribution to lower-level facilities. For protection, products should remain within their sealed outer cartons and/or inner boxes during distribution. To ensure that happens, products should be ordered and issued to the nearest packing unit quantity. For example, if 48 items are required, and 50 items are in an inner box, then 50 should be ordered and distributed. Packaging should be labeled clearly with complete product information, including the expiration date.

GENERAL GUIDELINES FOR STORAGE OF HEALTH COMMODITIES

ARVs and HIV tests should be stored according to a standard set of guidelines that are applicable to all health commodities. Well-functioning warehouses and storerooms at various levels will have sufficient space, acceptable storage conditions, explicit quality assurance mechanisms, and adequate security for the products, and must follow standard storage procedures.

📖 Refer to ***The Logistics Handbook*** for more a complete description and additional discussion of standard storage guidelines for health commodities.

GENERAL GUIDELINES FOR DISTRIBUTION OF HEALTH COMMODITIES

Health commodities can usually be distributed in one of two ways: a pickup system, where the lower level comes to the supplying facility, or a delivery system, where the upper-level supplying facility brings the products to the lower-level receiving facility.

Regardless of the type of distribution mechanism, transportation must be available whenever it is needed to fill regular or emergency orders. This is particularly important in a situation where vehicles are shared for multiple purposes, such as commodity delivery and supervisory visits. In a shared system, supervisory visit activities could take precedence over commodity delivery, which could delay the movement of commodities and could result in stockouts at the receiving facility. To the extent possible, dedicated vehicles should be available to transport products.

For all products, procedures should be in place to monitor and document the movement of commodities from the upper levels to the lower levels. The following actions should be completed at each distribution/receipt:

- Verify the type and quantity of products shipped and received.
- Conduct visual inspection, including expiration dates, for quality assurance.
- Complete and sign transaction records/vouchers.
- Store the products.
- Update stock-keeping records.

Never distribute products that are soon to expire and that will not be used before the expiration date. Not only do facilities (or even customers) receive unusable products, money and resources are also wasted in shipping, storing, and handling unusable products.

SPECIAL CHARACTERISTICS OF ARV DRUGS AND HIV TEST KITS THAT AFFECT STORAGE AND DISTRIBUTION

As with the design and implementation of the inventory control and logistics management information systems, certain characteristics of ARV drugs and HIV tests, and how they are used, will also affect the methods used for storage and distribution of these commodities. These characteristics include—

- short shelf life, ranging from six to 24 months
- high price
- high value in prolonging survival for AIDS patients
- necessity for cool storage
- limited number of sites authorized to use these products
- other commodities needed for administration
- use in specific combinations with other drugs.

In some cases these special characteristics may require implementation of a unique procedure for handling ARV drugs or HIV tests, but in other cases all that is required is a higher level of attention to or emphasis on existing procedures. This may be particularly true if ARV drugs or HIV tests are managed within an integrated system.

- ARVs are particularly sensitive to moisture. In addition to storing them in a dry, well-lit, well-ventilated storeroom, out of direct sunlight, ARVs should not be opened to repackage them.

- Treat ARVs and HIV tests as you would narcotics and controlled substances: provide a secure storage area with controlled and continuous access.
- Maintain cool storage (2 to 8° Celsius; 36 to 46° Fahrenheit) and cold storage facilities, including cool chain and cold chain, as required.
- Store commodities to facilitate first-to-expire, first-out (FEFO) procedures and stock management.
- Separate damaged, expired, and soon-to-expire commodities from usable commodities, remove them from inventory immediately, and dispose of them using established procedures. Do not issue commodities that could expire before they are distributed to and used by the client.

An additional consideration for ARV drug and HIV test distribution is the increased pressure on the transportation system, due to—

- lower safety stocks
- more frequent resupply cycle
- deliveries to accredited sites only.

RECOMMENDATIONS FOR STORAGE AND DISTRIBUTION OF ARV DRUGS AND HIV TEST KITS

1. WHENEVER POSSIBLE, INTEGRATE STORAGE AND DISTRIBUTION OF ARV DRUGS AND HIV TEST KITS.

Integrating the storage and distribution of ARV drugs and HIV tests can help avoid duplication of activities and result in better use of limited resources. However, it is critical to ensure that integrating these products into an existing system also makes sense from overall program and product management concerns. The feasibility of operating a fully integrated system will depend on a number of factors, including—

Management and reporting structure: If a program is charged with managing its own commodities (inventory control system) and reporting structure (LMIS), then it may make more sense to manage the storage and distribution of these products separately as well. This does not necessarily require establishing a completely separate storage facility; it could be accomplished by delineating a specific section of an existing storage facility for ARV drugs and HIV tests.

Number of facilities involved: If the number of facilities providing ART or HIV testing is relatively small compared to the number of facilities in the country, then moving products through an existing system may be counterproductive. For example, intermediary facilities (such as regional or district warehouses) would have to hold stock that would be distributed to very few facilities, lengthening the overall supply pipeline and adding to safety stock requirements.

Available resources: If a program has obtained its own vehicles, then it may make sense to use those vehicles for product distribution, rather than relying on other shared vehicles. This is especially true if ARVs or HIV tests have different ordering intervals from other items stored at a facility.

2. PROVIDE INCREASED LEVELS OF SECURITY DURING STORAGE.

Due to the high value of ARVs and HIV test kits, higher levels of security are required for these commodities. Storage facilities should have—

Locked storage area(s) within the warehouse or storeroom: Locked storage areas provide an extra level of security; not everyone who enters the storage facility has access to the ARVs or HIV tests. A locked room or vault, secure cage, or other structure, can be installed within the warehouse, or a locked cabinet or armoire can be installed in a smaller storeroom. If cool storage facilities are not already locked and tightly controlled, then a more secure area inside the cooler should be installed as well. The warehouse or storeroom itself should be robust in structure with no openings or weaknesses in the walls or roof that would allow easy entry after hours.

Limited access to HIV/AIDS commodities: The number of people who are allowed to access the secure storage area should also be limited. However, systems must be in place to ensure that someone with access is always available for filling regular or emergency orders, even if the total number of people with access is limited.

Higher level of accountability: Because of their high price and high value, ARV drugs and HIV tests should be treated as controlled substances. In most cases, procedures for controlled substances should include a second signature on the stockkeeping and transaction records for each stock movement. Requiring the signature of someone, in addition to the storekeeper, who is responsible for storing and distributing the product helps protect the product and the storekeeper.

More frequent audits: Facilities that report and order monthly should automatically conduct physical inventory and verify stock-keeping records each month when the report is completed and the order is placed. For facilities that report less frequently, a monthly physical inventory or other audit of HIV/AIDS commodities should be conducted.

3. ENSURE INCREASED SECURITY DURING TRANSPORT.

Transport should have the same level of security as the product in storage. Vehicles used to transport high-value commodities must be secure, with an enclosed bed and locking doors. For personal security, drivers should be equipped with radios and be in frequent communication with their dispatchers while on delivery. In some cases, depending on the quantities of commodities being transported, or past incidence of theft, it may even be necessary to provide armed guards or other supplemental security measures.

4. PAY SPECIAL ATTENTION TO FIRST-TO-EXPIRE, FIRST-OUT.

Due to the short shelf life and high cost of ARV drugs and HIV tests, special care must be taken to follow first-to-expire, first-out (FEFO) stock management and to monitor product expiration dates, to ensure that products are used before expiration to reduce waste. In addition, commodity managers must take action immediately if there is a risk that products will expire before they can be used. Action may include returning the products to the supplying facility for redistribution or directly transferring the products to a facility that can use them before they expire and notifying the procurement and program management units.

Remember that expiration dates are based on products being stored under ideal storage conditions. If a facility does not maintain adequate storage conditions, products may become unusable before their posted expiration date.

5. ENSURE PRODUCT INTEGRITY IF REISSUING RETURNED DRUGS.

In an ART program, excess supplies of drugs may be returned by patients who have switched treatment regimens, or by a patient's family in the event of the patient's death. Although pharmaceutical guidelines around drug contamination must be respected, in some programs, these drugs may be reissued to other patients. If reissuing

occurs, these drugs must first be inspected. If the product's packaging shows no signs of tampering or damage, and if the product is not close to expiry, it can be reissued to another patient.

6. DELIVER ARV DRUGS AND HIV TESTS TO ACCREDITED SITES ONLY.

ARV drugs and HIV tests should be distributed only to sites that are accredited or otherwise authorized for their use. This is easy to control in a vertical system; only authorized sites will be submitting orders for those products. In an integrated system, however, an extra level of control or oversight may be required. This may mean separate order forms for ARV drugs and HIV tests, which are only submitted by accredited facilities, or it may mean an extra signature by program personnel authorizing the order to be filled. Keep in mind, that there should not be so many controls in place—for example, extra signatures—that movement of the commodities is delayed.

7. CONSIDER USING PRIVATE OR OTHER COURIER/EXPRESS MAIL FACILITIES.

Depending on the number of sites to which commodities are being delivered and other available resources, it can be advantageous to use local courier or express mail (post office, DHL) services to distribute ARV drugs. If the number of sites is extremely limited, it may be much less expensive to distribute products through these channels, rather than maintaining one or more vehicles and the personnel needed to operate them. However, keep in mind that couriers must also be able to maintain product safety and follow security guidelines, including cool storage for those products that require it. The program is responsible for monitoring the performance of the couriers.

In Kenya, the National AIDS program has a contract with a local courier service to deliver ARVs on an emergency basis and to receive and forward monthly reports and orders to the national program. The arrangement has worked well and has resulted in greater than 90 percent reporting rates for LMIS reports for ARV drugs, although resources have been dedicated for ongoing monitoring of invoices and other required paperwork.

8. ENSURE THAT PRODUCTS USED TOGETHER ARE DISTRIBUTED TOGETHER.

Some HIV tests come packaged with most, if not all, consumable supplies needed to run the tests. However, several available tests do not come equipped with the necessary supplies. ARV drugs must be used in certain combinations in a specific regimen. If one drug is missing from a regimen, no substitutions can be made, and the patient cannot be treated. In both cases, ideally, all necessary products are ordered to provide the services the customers need. ARV drugs should be ordered together to ensure the proper regimen can be used. It is essential that the entire complement of products ordered is distributed together, at the same time, so that services such as HIV tests and ART can be given immediately upon receipt. If a reliable supply chain already exists for laboratory consumables, including those used with HIV tests, then that supply chain can be used to order and distribute lab supplies. It is then the job of the service provider to ensure that all necessary supplies are available where and when services are provided.

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ANNEXES

1. **CASE STUDY**
2. **SAMPLE LMIS RECORDS AND REPORTS**
3. **JOB AIDS**

KAAMANLAND HIV/AIDS PROGRAM ARV DRUG AND HIV TEST SUPPLY CHAINS: A CASE STUDY

This case study describes the supply chains for ARV drugs and HIV tests for the HIV/AIDS program in the imaginary country of Kaamanland, and it provides a context in which to review the records and reports that follow.

While Kaamanland is imaginary, the supply pipeline, inventory control system, and logistics management information system (LMIS) described are based on actual management systems to which DELIVER provides assistance. The following pipeline diagrams and LMIS forms illustrate recommended inventory control and LMISs and are consistent with the recommendations of this document.

KAAMANLAND ART PROGRAM AND SUPPLY CHAIN

In Kaamanland, antiretroviral therapy (ART) is currently provided in 14 ART sites—the national teaching hospital and regional hospitals. Within the next year, ART services will be expanded and available through accredited district hospitals. At that point, ART will be available at 60 sites.

ARV drugs are procured internationally by the Ministry of Health and are donated by international donors. Forecasting and quantification are done by program management. ARV drugs are stored in the central medical stores, which deliver drugs directly to ART sites monthly.

The inventory control system is a pull system that uses forced ordering maximum-minimum. ARV drugs are stored with other essential drugs in the central medical stores, but distribution of ARV drugs is not integrated with any other health commodity distribution.

ART sites use the *ART Daily Activity Register* to record the quantity of each drug given to patients in the dispensing area. Stockcards are used to record stocks received and issued, losses and adjustments, and stock on hand for ARV drugs stored at the service site. At the end of each month, the ART service provider together with the therapeutic committee look at their existing ART patient profile and determine the number of new patients who will be starting ART the following month. They record this information on the *Monthly Summary Report of ART Patients* and use the new patient information from that report to complete the *Worksheet for Calculating Monthly ARV Drug Orders for Estimated New Adult ART Patients,* which calculates the quantity of each ARV drug needed for the new patients for the next month.

The ART service provider uses the records, report, and worksheet to complete the *LMIS Report and Request for Antiretroviral Drugs.* The report and request is sent to the data-processing center of the Ministry of Health, where the information is compiled with reports from other ART sites. Within two days of receipt, the compiled orders are sent to the central medical stores for processing and delivery, and reports on ART sites and central warehouse activities are sent to program management for action as needed. Program managers use current information on

national stock status and consumption to update quantification of drug needs, procurement plans, and shipping schedules with external suppliers.

If an ART site has overstocks of any ARV drug, these drugs may be returned for redistribution to the central medical stores at the time the driver makes a routine delivery. The ART service provider and the driver use the *Report for Returning Products* to document the transfer of drugs.

In addition to the monthly report and request, each ART site prepares and submits the *Monthly Summary Report of ART Patients* to the data processing center. Program management uses this information to monitor ART services.

KAAMANLAND HIV TEST PROGRAM AND SUPPLY CHAIN

In Kaamanland, HIV testing is conducted in a variety of settings, including voluntary counseling and testing (VCT) centers; clinics offering prevention of mother-to-child transmission (PMTCT); and national, regional, and district hospitals.

HIV test kits are procured internationally by the Ministry of Health and are donated by international donors. Forecasting and quantification are done by program management. HIV tests are stored at the National Reference Laboratory and delivered directly to HIV testing sites monthly. The inventory control system is delivery truck, forced ordering maximum-minimum. HIV test kit distribution is not integrated with any other health commodity distribution.

HIV testing sites use the *Daily Log for Usage of HIV Tests* to record the quantity of each test administered to patients and its use in the testing algorithm. Although all HIV tests are conducted in the laboratory, separate logs are maintained for HIV testing for VCT, PMTCT, and clinical diagnosis.

Stockcards are used to record stocks received and issued, losses and adjustments, and stock on hand for HIV tests stored at the testing site. At the end of each month, the laboratory personnel or providers managing the HIV tests use the records and daily logs to complete the *LMIS Report and Request for HIV Tests.* The report and request is then given to the HIV test delivery team when it arrives at the testing site on a designated day of the following month. During the delivery team visit, data are checked and the HIV tests are issued to the testing site. On the team's return to the capital, the reports are submitted to the data-processing center of the Ministry of Health, where the information is compiled. Information processed from the reports, along with reports of stock levels in the National Reference Laboratory, is sent to program management for action as needed. Program managers use current information on national stock status and consumption to update the quantification of test kit needs, procurement plans, and shipping schedules with the external suppliers.

Figure 1

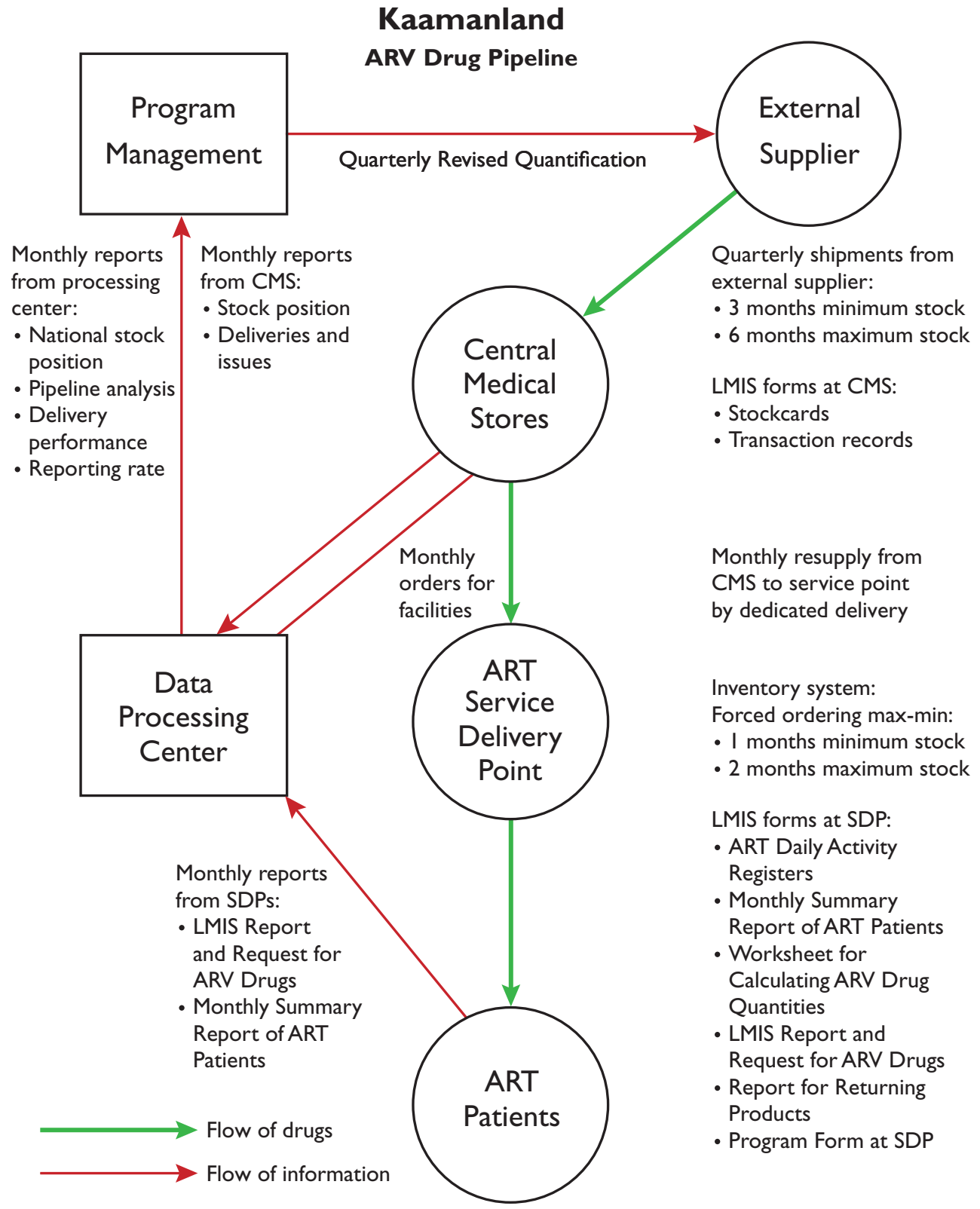
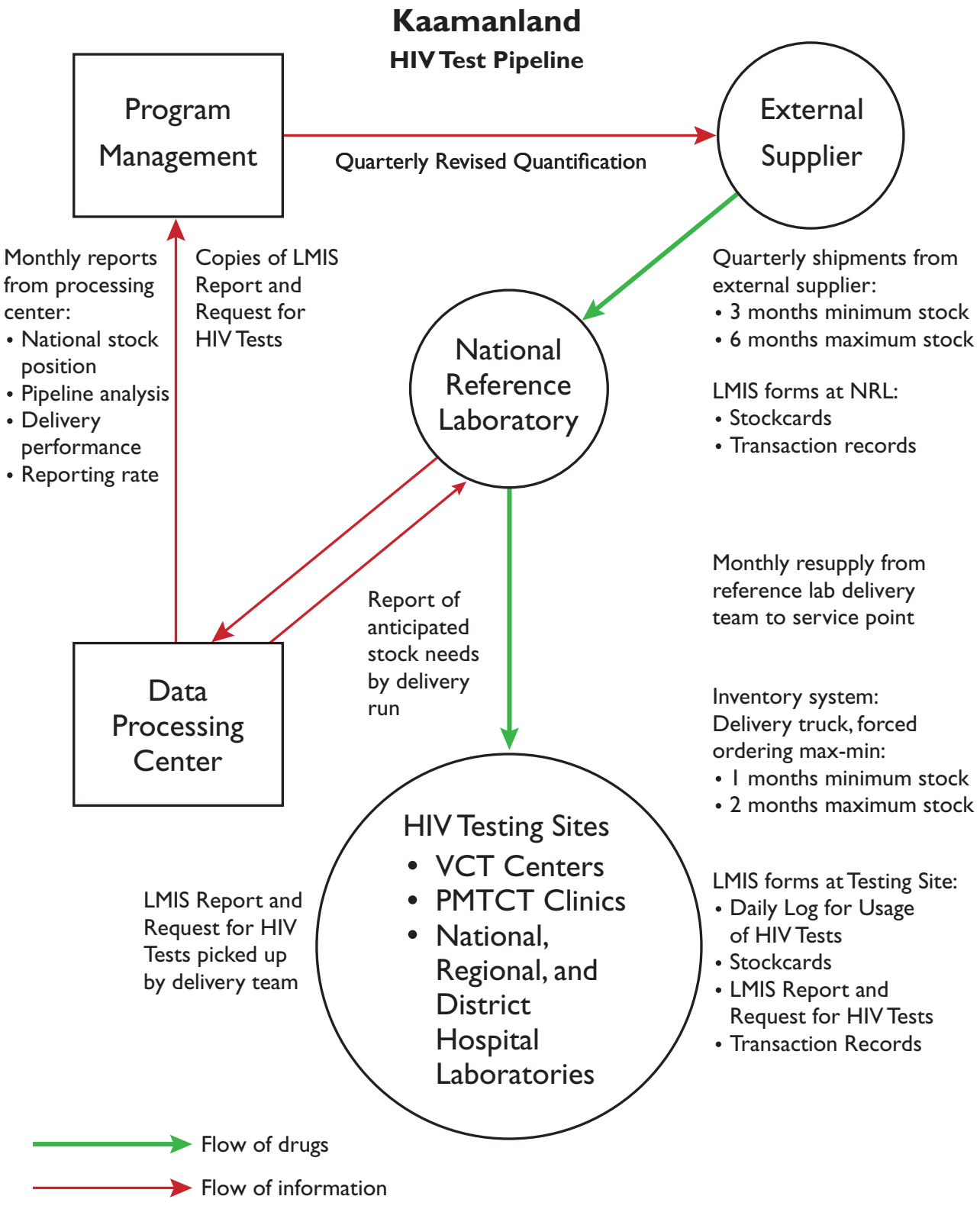

Kaamanland
ARV Drug Pipeline
Program Management
External Supplier
Quarterly Revised Quantification
Monthly reports from processing center:
• National stock position
• Pipeline analysis
• Delivery performance
• Reporting rate
Monthly reports from CMS:
• Stock position
• Deliveries and issues
Quarterly shipments from external supplier:
• 3 months minimum stock
• 6 months maximum stock
Central Medical Stores
LMIS forms at CMS:
• Stockcards
• Transaction records
Monthly orders for facilities
Monthly resupply from CMS to service point by dedicated delivery
Data Processing Center
ART Service Delivery Point
Inventory system:
Forced ordering max-min:
• 1 months minimum stock
• 2 months maximum stock
LMIS forms at SDP:
• ART Daily Activity Registers
• Monthly Summary Report of ART Patients
• Worksheet for Calculating ARV Drug Quantities
• LMIS Report and Request for ARV Drugs
• Report for Returning Products
• Program Form at SDP
Monthly reports from SDPs:
• LMIS Report and Request for ARV Drugs
• Monthly Summary Report of ART Patients
ART Patients
Flow of drugs
Flow of information

Figure 2


Kaamanland
HIV Test Pipeline
Program Management
External Supplier
Quarterly Revised Quantification
Monthly reports from processing center:
• National stock position
• Pipeline analysis
• Delivery performance
• Reporting rate
Copies of LMIS Report and Request for HIV Tests
Quarterly shipments from external supplier:
• 3 months minimum stock
• 6 months maximum stock
National Reference Laboratory
LMIS forms at NRL:
• Stockcards
• Transaction records
Monthly resupply from reference lab delivery team to service point
Report of anticipated stock needs by delivery run
Data Processing Center
Inventory system: Delivery truck, forced ordering max-min:
• 1 months minimum stock
• 2 months maximum stock
HIV Testing Sites
• VCT Centers
• PMTCT Clinics
• National, Regional, and District Hospital Laboratories
LMIS Report and Request for HIV Tests picked up by delivery team
LMIS forms at Testing Site:
• Daily Log for Usage of HIV Tests
• Stockcards
• LMIS Report and Request for HIV Tests
• Transaction Records
Flow of drugs
Flow of information

RECORDS AND REPORTS FOR MANAGING ARV DRUGS AND HIV TESTS

Note: *The sample forms included here are for illustrative purposes only. They were designed to complement the written guidelines and recommendations in the manual. The forms illustrate how the recommendations come together in the form of LMIS records and reports, which can then be used by a country program. For this example, the forms represent a system with a* ***monthly*** *reporting and ordering frequency and only include a subset of ARV drugs, rather than the comprehensive list of ARV drugs for all regimens. While the forms may be directly applicable in a country program, some modification will be necessary, depending on program-specific requirements or characteristics (i.e., maximum stock levels, treatment protocols/testing algorithms, etc.). Nevertheless, the sample forms do reflect the recommendations and guidelines indicated throughout this manual. Furthermore, the preprinting of commodity names, units, etc., on forms should be customized to each country or program setting and should, reflect the selected standard treatment or testing guidelines. Other records, which are not included in the sample or listed below but that are* ***critical*** *for an effective LMIS and country programs, include stock-keeping records (e.g., stock cards, bin cards, etc.) that track information on commodities in the storeroom; and transaction records (e.g., issue vouchers, packing slips, etc.) that track movement of commodities between different levels in the system.*

ART Daily Activity Register: This consumption record is used to track ARV drugs; it is maintained by the service providers who dispense drugs to patients. The quantities generated feed into the monthly consumption totals and are used to determine average monthly consumption and reorder quantities.

Monthly Summary Report of ART Patients: This program report is used to report the number of patients on ART by treatment regimen. It provides data on current and estimated number of new patients by regimen, which is useful for routine ordering during rapid scale-up.

Worksheet for Calculating Monthly ARV Drug Orders for Estimated New Adult ART Patients: This worksheet is used to translate the estimated number of new patients into the quantities of ARV drugs that will be required to treat the patients. The pharmacist or person responsible for ordering should complete the forms. Because pediatric dosing is non-standard, this worksheet is only applicable for estimating drug orders for adults. WHO is currently developing a web-based tool to facilitate calculations of pediatric dosages, and as DELIVER gains more experience, they will update their guidelines with useful tools for calculating pediatric orders.

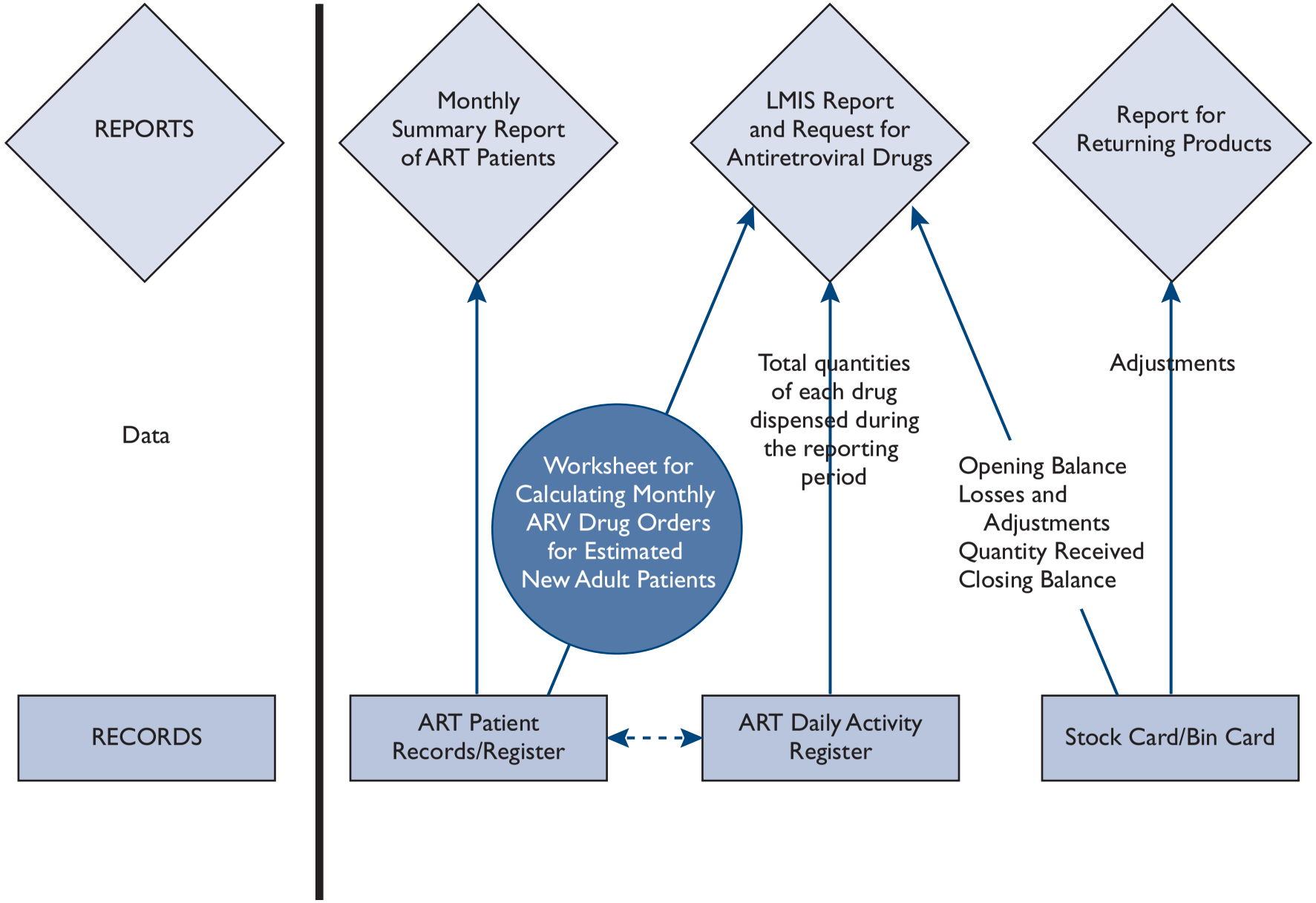
LMIS Report and Request for Antiretroviral Drugs: This is a combined logistics report and transaction record/order form for ARV drugs. It provides a full report of all three essential logistics data and demonstrates the order quantity calculations. The report is submitted to the supplier and shared with program staff.

Daily Log for Usage of HIV Tests: This consumption record tracks the use of HIV tests by purpose of use (VCT, PMTCT, clinical diagnosis), by brand, and by use of test (screening, confirmatory or tiebreaker). The service provider who conducts HIV testing maintains the log. The quantities recorded by brand feed into the monthly usage totals and are used to determine average monthly usage and reorder quantities.

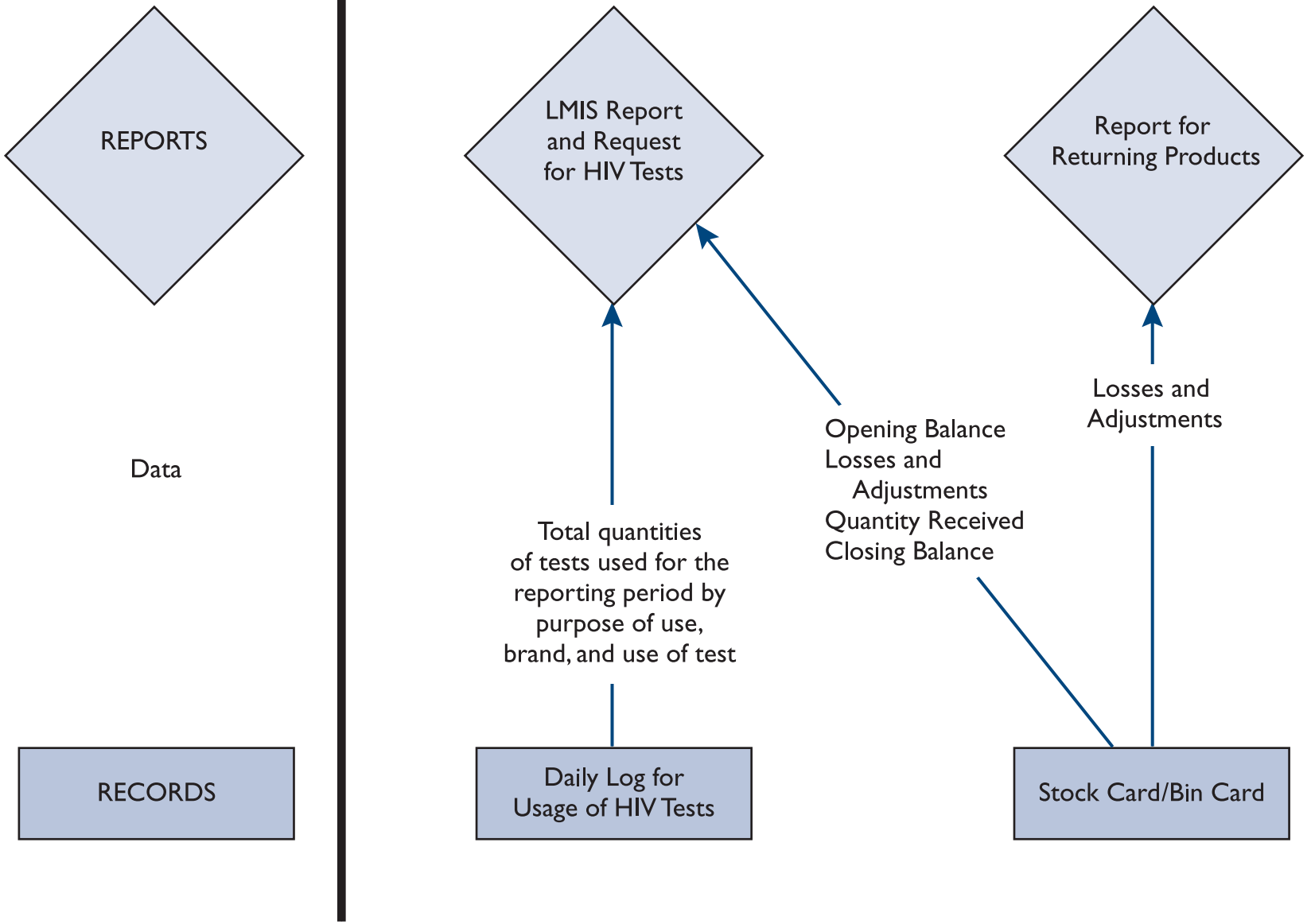
LMIS Report and Request for HIV Tests: This combined logistics report and transaction record/order form is used for HIV tests. It provides a full report of the three essential logistics data and demonstrates the order quantity calculations. It also includes summary use data divided by purpose and use of test. The report is submitted to the supplier and shared with the program staff.

Record for Returning Products: This transaction record is used to track products (ARV drugs and HIV tests) that are returned to the supplier for redistribution or, in the case of expired drugs, for destruction. While a generic issue and receipt voucher could also be used, the specific "Report for Returning Products" includes reasons for returning products that could be important in monitoring the logistics system, service provision, and the overall program.

Interrelationships between LMIS Records and Reports for ARV Drugs



Interrelationships between LMIS Records and Reports for HIV Tests



ART DAILY ACTIVITY REGISTER

		Quantities Dispensed																						
Facility: ____________		Fixed Dose Combinations					Single Drug Formulations																	
District: ____________		Stavudine/Lamivudine/ Nevirapine 30/150/200 mg Tabs	Stavudine/Lamivudine/ Nevirapine 40/150/200 mg Tabs	Stavudine/Lamivudine 30/150 mg Tabs	Stavudine/Lamivudine 40/150 mg Tabs	Zidovudine/Lamivudine 300/150 mg Tabs	Efavirenz 600 mg Tabs	Efavirenz 200 mg Caps	Nevirapine 200 mg Tabs	Zidovudine 300mg Tabs	Stavudine 30 mg Tabs	Stavudine 40 mg Tabs	Lamivudine 50 mg Tabs	Abacavir 300 mg Tabs	Didanosine 250 mg Caps	Didanosine 400 mg Caps	Nelfinavir 250 mg Tabs	Zidovudine syrup 10 mg/ml	Lamivudine oral solution 10 mg/ml	Nevirapine oral suspension 10 mg/ml	Stavudine oral solution 1 mg/ml	Abacavir oral solution 20 mg/ml	Didanosine powder for oral solution 10 mg/ml	Nelfinavir powder for oral suspension 50 mg/g
Date	Patient Name/ Number																							
Total Quantity Dispensed:																								
Quantity Dispensed for Month (running total):																								

MONTHLY SUMMARY REPORT OF ART PATIENTS

Reporting Period: From _____ to _____
mm/dd/yyyy mm/dd/yyyy

Facility: _____ District: _____

Code	Regimens	Current No. Patients This Month	Estimated No. New Patients Next Month	Total No. of Patients Next Month
A	**ADULT First Line**			
A1	Zidovudine 300 mg + Lamivudine 150 mg + Nevirapine 200 mg			
A2	Zidovudine 300 mg + Lamivudine 150 mg + Efavirenz 600 mg			
A3	Stavudine 30 mg + Lamivudine 150 mg + Nevirapine 200 mg			
A4	Stavudine 40 mg + Lamivudine 150 mg + Nevirapine 200 mg			
A5	Stavudine 30 mg + Lamivudine 150 mg + Efavirenz 600 mg			
A6	Stavudine 40 mg + Lamivudine 150 mg + Efavirenz 600 mg			
B	**ADULT Second Line**			
B1	Abacavir 300 mg + Didanosine 250 mg + Nelfinavir 250 mg			
B2	Abacavir 300 mg + Didanosine 400 mg + Nelfinavir 250 mg			
C	**PEDIATRIC First Line**			
C1	Zidovudine 10 mg/ml + Lamivudine 10 mg/ml + Nevirapine 10 mg/ml			
C2	Stavudine 1 mg/ml + Lamivudine 10 mg/ml + Nevirapine 10 mg/ml			
D	**PEDIATRIC Second Line**			
D1	Abacavir 20 mg/ml + Didanosine 10 mg/ml + Nelfinavir 10 mg/ml			
D2	Abacavir 20 mg/ml + Didanosine 10 mg/ml + Lopinavir/Ritonavir 80 mg/20 mg/ml			
	Total:			

Report prepared by:

Name _____ **Designation:** _____

Signature _____

WORKSHEET FOR CALCULATING MONTHLY ARV DRUG ORDERS FOR ESTIMATED NEW ADULT ART PATIENTS

	Total No. Estimated New Patients by Regimen	Formulations	No. New Patients by Formulation	Fixed Dose Combinations (FDC)					Single Drug Formulations (SDF)										
				Stavudine/Lamivudine/Nevirapine 30/150/200 mg Tabs	Stavudine/Lamivudine/Nevirapine 40/150/200 mg Tabs	Stavudine/Lamivudine 30/150 mg Tabs	Stavudine/Lamivudine 40/150 mg Tabs	Zidovudine/Lamivudine 300/150 mg Tabs	Efavirenz 600 mg Tabs	Efavirenz 200 mg Caps	Nevirapine 200 mg Tabs	Zidovudine 300 mg Caps	Stavudine 30 mg Tabs	Stavudine 40 mg Tabs	Lamivudine 150 mg Tabs	Abacavir 300 mg Tabs	Didanosine 250 mg Caps	Didanosine 400 mg Caps	Nelfinavir 250 mg Tabs
Adult First Line Regimens																			
Stavudine 30 mg + Lamivudine 150 mg + Nevirapine 200 mg		FDC																	
		FDC + SDF																	
		SDF																	
Stavudine 40 mg + Lamivudine 150 mg + Nevirapine 200 mg		FDC																	
		FDC + SDF																	
		SDF																	
Stavudine 30 mg + Lamivudine 150 mg + Efavirenz 600 mg		FDC + SDF																	
		SDF																	
Stavudine 40 mg + Lamivudine 150 mg + Efavirenz 600 mg		FDC + SDF																	
		SDF																	
Zidovudine 300 mg + Lamivudine 150 mg + Nevirapine 200 mg		FDC + SDF																	
		SDF																	
Zidovudine 300 mg + Lamivudine 150 mg + Efavirenz 600 mg		FDC + SDF																	
		SDF																	
Adult Second Line Regimens																			
Abacavir 300 mg + Didanosine 250 mg + Nelfinavir 250 mg		SDF																	
Abacavir 300 mg + Didanosine 400 mg + Nelfinavir 250 mg		SDF																	
Total no. new patients per drug (A)																			
No. pills/patient/30 days (B)				60	60	60	60	60	30	90	60	60	60	60	60	60	30	30	300
Total Quantity by Drug for 30 days (C) (C = A × B)																			

LMIS REPORT AND REQUEST FOR ANTIRETROVIRAL DRUGS

Reporting Period: From _____ to _____
mm/dd/yyyy

Maximum Stock Level: 2 Months

Minimum Stock Level: 1 Months

Facility: _____ District: _____
mm/dd/yyyy

Product	Basic Unit	Opening Balance	Quantity Received	Losses/ Adjustments	Quantity Dispensed	Closing Balance	Quantity Required for New Patients	Total Estimated Consumption	Maximum Stock Quantity	Quantity Needed
		A	B	C	D	E = [(A+ B) +/- C] – D	F	G = D+ F	H = G x 2	I = H – E
Fixed Dose Combinations										
Stavudine/Lamivudine/Nevirapine 30/150/200 mg	Tab									
Stavudine/Lamivudine/Nevirapine 40/150/200 mg	Tab									
Stavudine/Lamivudine 30/150 mg	Tab									
Stavudine/Lamivudine 40/150 mg	Tab									
Zidovudine/Lamivudine 300/150 mg	Tab									
Single Drug Formulations										
Efavirenz 600 mg	Tab									
Efavirenz 200 mg	Cap									
Nevirapine 200 mg	Tab									
Zidovudine 300 mg	Cap									
Stavudine 30 mg	Tab									
Stavudine 40 mg	Tab									
Lamivudine 150 mg	Tab									
Zidovudine syrup 10 mg/ml	ml									
Lamivudine oral solution 10 mg/ml	ml									
Nevirapine oral suspension 10 mg/ml	ml									
Stavudine oral solution 1 mg/ml	ml									

Prepared by: _____

Signature: _____

Date: _____

Remarks and explanation of losses and adjustments:

DAILY LOG FOR USAGE OF HIV TESTS

Purpose of HIV Tests (check one box for each register)

- ☐ VCT
- ☐ PMTCT
- ☐ Clinical Diagnosis
- ☐ Blood Safety
- ☐ Sentinel Surveillance
- ☐ Other: _____

Facility: _____ District: _____

Date	Client Name/Number	Determine			Uni-Gold			Bionor			Other		
		S	C	T	S	C	T	S	C	T	S	C	T
Total usage based on use of test:													
Total usage by brand:													
Total usage by brand for the month (running total):													

Summary of Use of Tests:		
Use of Test	**Total**	**Total for the Month (running total)**
Screening:		
Confirmatory:		
Tie breaker:		

Legend
S = Screening
C = Confirmatory
T = Tie breaker

LMIS REPORT AND REQUEST FOR HIV TESTS

Reporting Period: From _____ to _____
mm/dd/yyyy

Maximum Stock Level: 2 Months

Facility: _____ District: _____

Minimum Stock Level: 1 Months
mm/dd/yyyy

HIV Test	Basic Unit	Opening Balance	Quantity Received	Losses/ Adjustments	Quantity Used	Closing Balance	Maximum Stock Quantity	Quantity Needed
		A	B	C	D	E = [(A + B) +/- C] - D	F = D x 2	G = F - E
Determine	Test							
Uni-Gold	Test							
Bionor	Test							
Other	Test							
	Test							

Remarks and explanations of losses/adjustments:

Summary of Usage of HIV Tests by Purpose, Brand, and Use of Test						
	VCT	PMTCT	Clinical Diagnosis	Blood Safety	Other	Totals
Determine						
Uni-Gold						
Bionor						
Other						
Total Screening						
Total Confirmatory						
Total Tie breaker						

Prepared by:

Full Name	Signature	Designation	Date

REPORT FOR RETURNING PRODUCTS

Sent to: _____

Facility returning products: _____

Product Description	Quantity Returned	Expiry Date	Reason for Return

Name of person returning the products: _____ Date _____20___

Signature of person returning the products: _____

Carrier

I CERTIFY THAT the above quantities for return were received by me except where explained below.

Name of Carrier _____ Date _____20___

Carrier's Signature _____

Comments: _____

_____

Receiving Facility

I CERTIFY THAT the above quantities for return were received by me except where explained below.

Receiver's Name: _____ Date _____20___

Receiver's Signature _____

Comments: _____

_____

JOB AIDS FOR LMIS RECORDS AND REPORTS FOR MANAGING ARV DRUGS AND HIV TESTS

Note: The following job aids are designed to accompany the sample forms provided for managing ARV drugs and HIV tests. For each form, the job aids provide more detail about the task, purpose, responsible person, and timeframe for completion. As with the sample forms, these have been designed to complement the written guidelines and recommendations in the manual; they represent a system with a monthly reporting and ordering frequency and only include a subset of ARV drugs, rather than the comprehensive list of ARV drugs for all regimens. Because the sample forms are modified to meet program-specific requirements or characteristics (i.e., maximum stock levels, treatment protocols/testing algorithms, etc.), the job aids will also require modification.

JOB AID: COMPLETING THE ART DAILY ACTIVITY REGISTER

This job aid will guide you through the process of completing the ART Daily Activity Register (DAR). This record is kept at the dispensing areas where the drugs are dispensed to patients.

The ART DAR tracks the quantities of drugs dispensed to patients. Every time a drug is dispensed, it must be recorded in the appropriate column. The information collected will be incorporated into the LMIS Report and Request for Antiretroviral Drugs. The ART Daily Activity Register is usually kept in a book or ledger.

Task:	Completing the ART Daily Activity Register
Completed by:	Person dispensing drugs (i.e. Dispensing Pharmacist, etc.)
Purpose:	To record and track the number of ARV drugs dispensed to patients
When to perform:	Each time an ARV drug is dispensed to a patient and when calculating the running total of drugs dispensed for the month
Materials needed:	A blank ART Daily Activity Register, calculator, and pen

Steps	Actions		Notes
1.	**Select the appropriate action:**		
	IF		**THEN**
	Starting a new book or ledger	⇨	Continue to step number 2
	Recording when dispensing drug	⇨	Skip to step number 3
Steps to take when starting a new book or ledger			
2.	**ART Daily Activity Register Book or Ledger** **Cover:** On the cover sheet write the: a. Name of the facility b. Name of the district Continue with step number 3		The book or ledger will contain daily activity registers for a number of days, depending on the size of the book or ledger.

Steps	Actions	Notes
Steps to take when starting a new page and dispensing drugs		
3.	**Facility:** Write the name of your health facility.	
4.	**Districts:** Write the name of the district where the facility is located.	
5.	**Date:** Enter the date the form was prepared.	
6.	**Patient Name/Number:** Write the name and/or number assigned to the patient receiving the ARV drugs.	
7.	**Fixed Dose Combinations and/or Single Drug Formulations:** For each patient, enter in the appropriate column the quantities of each drug you dispense.	
8.	**Select the appropriate action:**	
	IF	**THEN**
	THERE ARE NO MORE BLANK LINES ON THIS PAGE FOR MORE PATIENTS ⇨	Continue with step 9 and then go to step 3 when starting a new page
	YOU HAVE SEEN YOUR LAST PATIENT FOR THE DAY ⇨	Continue with step 9
9.	**Total Quantity Dispensed:** Write the total quantity of each ARV drug dispensed by adding the quantities entered for each patient listed on the page.	Do this addition each time you complete one page. If there are products that have not been dispensed, write "0" in the spaces on the row for "totals." Do not leave the spaces blank.
10.	**Quantity Dispensed for Month (running total):** After a page is full, use the total quantity dispensed and previous page running total to calculate the total quantities of each product that you have dispensed so far during the month.	At the end of the last day of the month, add the total quantity dispensed for each drug from the current page; add it to the running total from the previous page to calculate the total quantity of each drug dispensed for the entire month. At the beginning of a new month, with the first patient, start the running total at the bottom of each page with "0" for that month. If you have products that have not been dispensed, write "0" in the spaces on the row for "totals." Do not leave the spaces blank. You will transfer this total quantity to column D of the LMIS Report and Request for Antiretroviral Drugs when reporting and ordering.
11.	**Check your calculations twice.**	Be sure that you have not erroneously entered page totals for one drug item with the totals for another drug item. Any error in the quantities dispensed means that you will not order the correct amount.

The task is complete when—

- ❑ The facility and district names are filled in.
- ❑ Patient name and numbers and quantities of drugs dispensed to each patient are entered.
- ❑ The quantities of drugs recorded on each row of the page are totaled by column to calculate the total quantity dispensed for each drug.
- ❑ The total quantity dispensed for each drug is added to the running total quantity dispensed from the previous page to calculate the running total of the quantities dispensed for the month.
- ❑ The total quantities of drugs dispensed during the month are transferred to the LMIS Report and Request for Antiretroviral Drugs (at the time of reporting and ordering).

JOB AID: COMPLETING THE MONTHLY SUMMARY REPORT OF ART PATIENTS

This job aid will guide you through the process of completing the Monthly Summary Report of ART Patients.

The Monthly Summary Report of ART Patients provides the number of patients by regimen. This form can be used for tracking the number of ART patients, for estimating the numbers of new patients for whom you will order drugs (using the Worksheet below), and for monitoring and supervision to cross-check total numbers of patients by regimen with total quantities of drugs dispensed.

Task:	Completing the Monthly Summary Report of ART Patients
Completed by:	ART service provider or person responsible for reporting
Purpose:	To report the number of ART patients (current and new) by regimen
When to perform:	Every reporting cycle Prior to completing the Worksheet for Calculating Monthly ARV Drug Orders for Estimated New Adult ART Patients
Materials needed:	Blank Summary Report of ART Patients, calculator, and pen

Steps	Actions	Notes
1.	**Reporting Period:** Write the reporting period with day, month, and year.	e.g., 15/03/2006 to 15/04/2006
2.	**Facility Name:** Write the name of your facility.	
3.	**District:** Write the name of the district where the facility is located.	
For each ART Regimen:		
4.	**Current No. Patients This Period:** Write the total number of patients who are currently on the regimen.	You can obtain the number of patients on each regimen from pharmacy records, if they are tracking numbers of patients on each regimen or, more likely, from the ART clinic patient register. Current patients refer to the patients who were active during the reporting period for the report being prepared.
5.	**Estimated No. New Patients Next Period:** Write the number of new patients who are estimated to be enrolled on each regimen.	The number of estimated new patients will probably come from the ART clinic and/or the facility head/manager. Likely sources for this data include the therapeutic committee, the ART clinic waiting list, doctors' records, or other planning documents.
6.	**Total No. of Patients Next Period:** Add the patients currently on the regimen and the estimated new patients who will be on the regimen.	Calculations will be done horizontally by row; this total represents all the current and estimated new patients on each regimen.
7.	**Total:** After all the cells in the columns are filled in, add the numbers to obtain the total number of current patients, estimated new patients, and the total of all patients.	These calculations will be done vertically to provide Total Current No. Patients this Period (across all regimens), Total Estimated New Patients for the Next Period, and overall Total of all patients for the next period.
8.	**Report prepared by Name/Designation/Signature:** Enter the name and designation of the person preparing the report; preparer signs the report.	

The task is complete when—

- ❑ The number of current patients, number of estimated new patients, and total number of patients for the next period are filled in for each regimen.
- ❑ The total number of current patients for this period, estimated new patients for the next period, and total number of patients for next period are calculated.
- ❑ The person preparing the report writes his/her name and designation and signs the report.

JOB AID: COMPLETING THE WORKSHEET FOR CALCULATING MONTHLY ARV DRUG ORDERS FOR ESTIMATED NEW ADULT ART PATIENTS

This job aid will guide you through the process of completing the Worksheet for Calculating Monthly ARV Drug Orders for Estimated New Adult ART Patients.

The worksheet helps the pharmacist to estimate the quantities of ARV drugs that will be needed for new patients beginning treatment during the next resupply cycle. This form can also be used to estimate the quantities of ARV drugs that will be needed for continuing patients who are switching to drugs that are not kept at the facility store.

Task:	Completing the Worksheet for Calculating Monthly ARV Drug Orders for Estimated New Adult ART Patients
Completed by:	Pharmacist
Purpose:	To estimate the quantities of ARV drugs that will be needed for new patients who will be using ARVs, as well as the number of current patients on new regimens
When to perform:	When a patient starts a regimen for the first time Prior to completing the LMIS Report and Request for Antiretroviral Drugs
Materials needed:	Blank Worksheet for Calculating Monthly ARV Drugs Orders for Estimated New Adult ART Patients, calculator, and pen

Note: The worksheet has darkened cells. You cannot write in the darkened cells. Write only in the blank cells.

The worksheet is completed from left to right, starts with the estimated number of new patients for the next month, and uses those numbers to determine the number of tablets of each drug that need to be ordered for these patients.

Steps	Actions	Notes
For each ART Regimen:		
1.	**Total No. of Estimated New Patients by Regimen:** Write the total number of estimated new patients who will be enrolled on each regimen listed.	The total number of estimated new patients by regimen can be obtained from the Monthly Summary Report of ART Patients. For the first column, and for each regimen row, enter the numbers of new patients, not the quantities of drugs. For example, there are 20 estimated new patients that will receive stavudine 30 mg + lamivudine 150 mg + nevirapine 200 mg. If no new patients will be receiving a regimen, write "0" in that box.
2.	**No. of New Patients by Formulation:** Write the number of new patients who will receive each formulation available.	For each regimen, allocate the total number of estimated new patients entered in the first column to one or more of the available formulations listed (FDC, FDC+SDF, or SDF). The pharmacist or person managing and dispensing stock should make this decision; they should take into account existing stocks on hand, as well as the appropriate clinical factors. The total number of patients across all the formulations within a regimen should total the number of estimated new patients for the regimen. For example, based on the 20 estimated new patients above receiving stavudine 30 mg + lamivudine 150 mg + nevirapine 200 mg, 10 will receive the triple FDC, six will receive the double FDC+SDF, and four will receive just SDFs. If no new patients will be receiving a formulation, write "0" in that box.

Steps	Actions	Notes
3.	**Fixed Dose Combinations and/or Single Drug Formulations:** Enter the number of new patients by formulation into all the unshaded boxes in that row to determine the number of patients receiving each formulation of each drug.	Every time a number is identified for new patients receiving a formulation of a regimen, transfer that number to all the unshaded cells in that row. Continue until all unshaded cells in the regimen rows are filled in. This indicates how many new patients will be receiving each of the drug formulations that make up the regimen. To continue the example from above, enter number 10 in the unshaded cell for the triple FDC; enter number 6 in both the unshaded cell for the double FDC and the unshaded cell for the SDF of nevirapine; enter number 4 in all three of the unshaded SDF cells for stavudine, lamivudine, and nevirapine, respectively. If no new patients will be receiving a drug, write "0" in that box.
Now for each drug listed in the columns:		
4.	**Total No. New Patients per Drug:** Write the total number of new patients who will be receiving each drug.	This calculation is done vertically. Total all the unshaded cells in each column for each drug (i.e., the numbers of new patients that will receive each drug). If no new patients will be receiving a drug, write "0" in that box.
5.	**Total Quantity by Drug for 30 days:** Write the total quantity of each drug required to treat all new patients for the month.	Multiply the total number of patients per drug (row A for that column) by the number of pills per patient, per 30 days (row B for that column). This is the total quantity of each drug that is needed to treat all new patients during the upcoming 30 days. Be sure to recheck all calculations in the worksheet. Mistakes in the worksheet will lead to mistakes in determining order quantities. **Note:** Total Quantities of Drugs for New Patients will be transferred to column F of the LMIS Report and Request for Antiretroviral Drugs.

The task is complete when—

- ❑ The total number of patients is recorded for each regimen.
- ❑ The number of patients for each regimen is divided by formulation.
- ❑ The total number of new patients, per drug, is entered.
- ❑ The total quantity of drugs for 30 days is calculated and the information is transferred to the LMIS Report and Request for Antiretroviral Drugs.

JOB AID: COMPLETING THE LMIS REPORT AND REQUEST FOR ANTIRETROVIRAL DRUGS

This job aid will guide you through the process of completing the LMIS Report and Request for Antiretroviral Drugs.

Task:	Completing the LMIS Report and Request for Antiretroviral Drugs
Completed by:	The designated person at the SDP responsible for filling the report and placing orders
Purpose:	To provide logistics data to the central level To provide a report on the stock status of ARV drugs at the facility To order additional supplies of ARV drugs
When to perform:	At the end of the order interval (every month)
Materials needed:	A blank LMIS Report and Request for Antiretroviral Drugs, calculator, and pen

Note: This form is prepared in quadruplicate (one original and three copies). Use a pen to fill out the top copy; make sure the writing clearly shows through on all the copies.

Also, remember to write "0" in the boxes if no quantity was received or dispensed, and there were no losses or adjustments. Do not leave boxes blank.

Steps	Actions	Notes
1.	**Reporting Period:** Write the period of reporting with day, month, and year.	e.g., 15/03/2006 to 15/04/2006
2.	**Facility:** Write the name of the facility.	
3.	**District:** Write the name of the district where the facility is located.	
For each Drug:		
4.	**Opening Balance:** Write the balance on the beginning of the period of reporting.	You can find the Opening Balance on the stock card or in column E/Closing Balance of the previous report.
5.	**Quantity Received:** Write the quantity you received during the month covered by the report.	You can find the quantity received on the stock card.
6.	**Losses and/or Adjustments:** Write any losses or adjustments that occurred during the month covered by the report.	You can find losses and adjustments on the stock card. Be sure to write a minus (–) sign for a negative adjustment or loss.
7.	**Quantity Dispensed:** Write the quantity that was dispensed to patients during the month covered by the report.	You can find the quantity dispensed on the last page of the ART Daily Activity Register for the month. Use the Quantity Dispensed for the Month (running total) for the month covered by the report. Be sure to check the calculations.
8.	**Closing Balance:** Write the total stock on hand at the end of the month covered by the report.	The closing balance is calculated as the beginning balance plus quantity received minus quantity dispensed plus or minus losses or adjustments. Using the column headings on the form, the formula for the calculation is— E = A + B +/– C – D The closing balance can also be verified by checking the stock card for the closing balance on the last day of the month order covered by the report, or by conducting a physical inventory of quantities in the storeroom. The stock card needs to be up-to-date; it is recommended that you conduct a physical inventory to check the closing balance.
9.	**Quantity Required for New Patients:** Write the quantity of ARV drugs that will be required for the estimated new ART patients.	The Quantity Required for New Patients is obtained from row C of the Worksheet for Calculating Monthly ARV Drug Orders for Estimated New Adult ART Patients.

Steps	Actions	Notes
10.	**Total Estimated Consumption:** Write in the total estimated consumption by adding the quantity dispensed during the month and the quantity required for new patients.	This is the estimated quantity to be dispensed next month; the quantity is the total sum of the quantities dispensed for the month covered by the report being prepared (column D of this report) plus the quantities required for estimated new patients. Using the column headings on the form, the formula for the calculation is— G = D + F
11.	**Maximum Stock Quantity:** Calculate and write the maximum stock quantity.	The maximum stock quantity is calculated by multiplying the quantity estimated to be consumed during the next month by the maximum stock level. In the example on these forms, the maximum stock level is 2 months; the total estimated consumption is multiplied by 2. Remember, although the maximum stock level remains constant at 2 months, the actual maximum quantities change every time there is an order because the quantity expected to be consumed changes every month.
12.	**Quantity Needed:** Calculate and write the quantity of the product that you need to order.	The Quantity Needed is determined by subtracting the closing balance/stock on hand from the maximum quantity. Using the column headings on the form, the formula for the calculation is— I = H – E If the calculation is a negative number (example, – 80), you already have enough stock so the order quantity is "0." Be sure to write "0" as the order quantity; do not leave the box blank. It is highly recommended that the Quantity Needed should be calculated in basic units (i.e., tablets); the issuing facility will convert the quantities to the appropriate pack sizes.
13.	**Remarks:** Write additional comments and any explanations related to losses and adjustments.	For example, if you reported losses or adjustments, give a brief description of the loss/adjustment.
14.	**Prepared by:** Enter the name of the person who prepared the form.	
15.	**Signature:** Person who prepared the form signs the form.	
16.	**Date:** Enter the date the form was prepared.	

The task is complete when—

- ❑ The opening balances, quantities received, quantities dispensed, and losses or adjustments are filled in for each product.
- ❑ The closing balances are correctly calculated, filled in, and checked against the stock cards.
- ❑ The quantities of each drug required for new patients are transferred from the Worksheet for Calculating ARV Drug Orders for Estimated New Adult ART Patients.
- ❑ The total estimated consumption is calculated.
- ❑ The maximum stock quantities are correctly calculated and filled in.
- ❑ The quantities needed are correctly calculated and filled in
- ❑ The report/request is signed and dated; losses and adjustments are explained.

JOB AID: COMPLETING THE DAILY LOG FOR USAGE OF HIV TESTS

Task:	Completing the Daily Log for Usage of HIV Tests
Completed by:	All service providers who perform HIV tests and are responsible for reporting
Purpose:	To track usage of HIV tests by purpose of use, brand and use of test To collect information for the LMIS Report and Request for HIV Tests
When to perform:	Each time an HIV test is performed At the end of each day
Materials needed:	A blank Daily Log for Usage of HIV Tests, calculator and pen

Note: The form is printed in a book or ledger.

Using the Daily Log will help you prepare your report at the end of the reporting period. Remember, when you place an order, you will need to provide the total number of tests used during the month by purpose of use, brand, and use of test.

Steps	Actions	Notes
1.	**Select the appropriate action:**	
	IF ⇨	**THEN**
	Starting a new book or ledger ⇨	Continue with step number 2
	Recording when conducting a test ⇨	Skip to step number 3
Steps to take when starting a new book or ledger		
2.	**Daily Log for Usage of HIV Tests Book or Ledger Cover:** On the cover sheet write the: a. Name of the facility b. Name of the district Continue with step number 3	
Steps to take when starting a new page and conducting tests		
3.	**Purpose of Use of HIV Tests:** Check a box for the corresponding service provided.	The form refers to VCT, PMTCT, Blood Safety, etc. It is assumed that a separate Daily Log will be used for each different purpose, (i.e., tests performed for VCT will be recorded on a different Daily Log than those performed for Blood Safety, or PMTCT).
4.	**Facility:** Write the name of your health facility.	
5.	**District:** Write the name of the district where the facility is located.	
6.	**Date:** Enter the date the form was prepared.	
7.	**Client Name/Number:** Write the name and/or number assigned to the client to be tested..	
8.	**S, C, T:** Place either a tick (✓), check (✓), cross (✝), or I (I) in each cell below the brand (Determine, Uni-Gold, Bionor, other) and below the corresponding use of the test (S for screening, C for confirmatory, and T for tie breaker).	The brands of tests listed here are for illustrative purposes, but preprint the names based on the recommended standard testing algorithm for that purpose. Add an extra space for emergency use. Use a consistent method for marking off use—a tick (✓), check (✓), cross (✝), or I (I).

Steps	Actions	Notes
9.	**Select the appropriate action:**	
	IF	**THEN**
	There are no more blank lines on this page for more patients ⇨	Continue with step 10 and 11 and then go to step 3.
	You have seen your last client for the month ⇨	Continue with step 10.
	You are conducting another test ⇨	Go back to step 6.
10.	**Total Usage based on Use of Test:** For each brand of test (Determine, Uni-Gold, Bionor, other), total the tests by type (screening, confirmatory, and tie breaker).	Do this calculation vertically. Make sure you add all the tests used for each sub-column within the overall brand column (i.e., the total number of tests used for screening, confirmatory, and tie breaker within each brand). For tests that are not used, write "0" in the spaces. Do not leave the spaces blank.
11.	**Total Usage by Brand:** Add the numbers under S, C, T and enter the total number of tests under each brand.	The total usage by brand consists of adding the number of tests used for screening and confirmation and tie-breaker for each brand.
12.	**Total Usage by Brand for the Month (running total):** After the page is full, add the Total Usage by Brand to the previous page running total for the brand to calculate the running total number of tests used by brand for that month.	At the end of the last day of the month, add the total usage by brand for the current page; add that total to the running total usage by brand from the previous page to calculate the total quantity used of each brand for the entire month. When you start to test clients for a new month, start a new running total usage by brand at the bottom of each page for that new month. For tests not used, write "0" in the spaces on the row for "totals." Do not leave the spaces blank. You will transfer this total usage by brand for the entire month to column D of the LMIS Report and Request for HIV Tests when you report and order.
13.	**Summary of Use of Tests:** To calculate the S, C, and T totals, calculate the total number by use of test (screening, confirmatory, and tie-breaker) by adding all the S's for each brand, all the C's for each brand, and all the T's for each brand.	This calculation requires going back to the row of Total Usage based on use of test and adding all the screening, confirmatory, and tie breaker tests (across brands).
14.	**Running Total for the Month:** (under the Summary of Use of Tests) For the running total of the month of use of tests, add the number of tests by use of tests from the summary of each day.	This running total is calculated in a similar way to the way the running total of usage by brand is calculated. The total for this current page is added to the running total from the previous page; the sum of the two becomes the new running total for the month. At the start of a new month, start a new running total for the new month. This number for each of the types (S, C, and T) is transferred to the summary table of HIV Tests by Purpose of Use, Brand and Use of Test on the LMIS Report and Request for HIV Tests.

Steps	Actions	Notes
The task is complete when—		
❑	The purpose of use, facility name, and district are filled in.	
❑	The client names and numbers, and results by use of test are entered.	
❑	The total number of tests by use of test and by brand are entered.	
❑	The running total usage of tests by brand for the month is calculated.	
❑	The summary of use of tests is completed, including the running total for the month..	
❑	The total quantities of tests organized by purpose of use for brand and use of test during the month are transferred to the LMIS Report and Request Form for HIV Tests.	

JOB AID: COMPLETING THE LMIS REPORT AND REQUEST FOR HIV TESTS

Task:	Completing the LMIS Report and Request for HIV Tests
Completed by:	The designated person at the SDP responsible for filling the report and request
Purpose:	To provide logistics data to the central level To provide a report on the stock status of HIV tests in the facility To order additional HIV tests To provide evidence of issue and receipt of HIV tests
When to perform:	At the end of every order interval (every month)
Materials needed:	Stock on Hand and Losses/Adjustments data (from stock cards or physical inventory), usage data (from Daily Log for Usage of HIV Tests), calculator, and pen

Note: This form is prepared in quadruplicate (one original and three copies). Use a pen to fill out the top copy; make sure the writing clearly shows through on all the copies.

Also, remember to write "0" in the boxes if there was no quantity received or used, or no losses or adjustments. Do not leave boxes blank.

Steps	Actions	Notes
1.	**Reporting Period:** Write the period of reporting with day, month, and year.	e.g., 15/03/2006 to 15/04/2006
2.	**Facility:** Write the name of the facility.	
3.	**District:** Write the name of the district where the facility is located.	
For each brand of HIV test:		
4.	**Opening Balance:** Write the balance of the beginning of reporting period.	The opening balance can be found on the stock card or in column E/Closing Balance of the LMIS Report and Request for the previous month.
5.	**Quantity Received:** Write the quantity you received during the month.	The quantity received can be found on the stock card. This is the quantity received between the previous order and this order.
6.	**Losses and/or Adjustments:** Write any losses or adjustments that occurred during the month.	Losses and adjustments can be found on the stock card. Be sure to write a minus (–) sign for a loss or a negative adjustment.
7.	**Quantity Used:** Write the quantity that was used during the month covered by the report.	The quantity used can be found on the Daily Log for Usage of HIV Tests. Use the Total by Usage Brand for the Month (running total). Be sure to check the calculations as well.
8.	**Closing Balance:** Write the total stock on hand at the time of reporting.	The closing balance is calculated as opening balance plus quantity received minus quantity used, plus or minus losses or adjustments. Using the column headings on the form, the formula for the calculation is— E = A + B – C +/– D You can also verify the closing balance by checking the stock card for the balance at the time of reporting. It is recommended that you conduct a physical inventory of what is actually in the storeroom to ensure that the stock card has been updated.

Steps	Actions	Notes
9.	**Maximum Stock Quantity:** Calculate and write the maximum stock quantity.	The maximum stock quantity is calculated by multiplying the quantity used during the month by the maximum stock level (2 months in this example). Remember that although the maximum stock level remains 2 months, the actual maximum stock quantities change every time there is an order because the quantities used every month change.
10.	**Quantity Needed:** Calculate and write the quantity of the tests needed.	The Quantity Needed is determined by subtracting the closing balance/stock on hand from the maximum stock quantity. Using the column headings on the form, the formula for the calculation is— G = F – E If the calculation gives a negative number (example: – 80), then you already have enough stock so the order quantity is "0." Be sure to write "0" as the order quantity; do not leave the box blank.
11.	**Remarks and explanations of losses/adjustments:** Write additional comments and any explanations related to losses and adjustments.	For example, if you reported losses or adjustments, write a brief description of the loss/adjustment.
12.	**Summary of Usage of HIV Tests by Purpose of Use, Brand and Use of Test:** Within each purpose of use, record the total tests used by brand and by use of test during the month covered by the report.	Obtain the summaries of total tests used by brand and total tests by use of test (within each purpose of use) from the totals for the month on each Daily Log for Usage of HIV Tests. Remember that each purpose will have a different log book and also, that the monthly total by brand will be on the bottom row and the monthly total by use will be in the summary table.
13.	**Name/Signature/Designation of Person and Date:** The person completing the Report and Request form writes his/her name, designation, and then signs and dates the report.	

The task is complete when—

- ❑ The reporting period, facility, and district name are filled in.
- ❑ The opening balances, quantities received, quantities used, and losses or adjustments are filled in for each product.
- ❑ The closing balances are correctly calculated and filled in.
- ❑ The maximum stock quantities are correctly calculated and filled in.
- ❑ The quantities needed are correctly calculated and filled in.
- ❑ The Summary of Usage of HIV Tests Purpose of Use, Brand, and Use of Test is completed.
- ❑ The person filling out the report has written his/her name, designation, signature, and the date the report is completed.

JOB AID: COMPLETING THE REPORT FOR RETURNING PRODUCTS

Task:	Completing the Report for Returning Products
Completed by:	The designated person at the SDP responsible for filling the report
Purpose:	To provide a tracking document for products returned to the central level from the health facility level
When to perform:	Whenever there are surplus or unusable products that need to be returned to the central level
Materials needed:	A blank Report for Returning Products, calculator, and pen

Note: This form is a quadruplicate with four copies (an original and three copies). Use a pen to fill out the top copy; make sure the writing clearly shows through on all the copies.

This form is to return either tests or ARV drugs that are in surplus or that are unusable because they are damaged or expired, or will expire before they can be used. Products are in surplus if the SDP has two months or more of stock above the maximum stock level.

Steps	Actions	Notes
1.	**Sent to:** Write the name of the facility to which the products are returned.	This will almost always be the central level.
2.	**Facility returning products:** Write the name of the facility.	
For each product being returned:		
3.	**Product Description:** Write the name of the product being returned.	As with stock cards, write the form and strength of the product.
4.	**Quantity Returned:** Write the quantity of the product that you are returning.	As with other forms used in the system, record the quantities in order units: tablets, capsules, tests, etc.
5.	**Expiry Date:** Write the date of expiry of the products.	If there are multiple expiry dates for the same product, list all the different expiry dates and the quantities of each product for each of the different expiry dates
6.	**Reason for Nonuse:** Write the reason you are returning the product (damaged, expired, etc.).	
7.	**Name of person returning products/Date/ Signature:** The person who is returning the products writes her/his name, and dates and signs her/his name.	
8.	**Name of Carrier/Date/Carrier's Signature:** The person who is transporting the products from the sending facility to the receiving facility writes her/his name and date, and signs her/his name.	
9.	**Comments:** The carrier writes any comments, as appropriate.	
10.	**Receiver's Name/Date/Receiver's Signature:** The person who receives the products at the receiving facility writes her/his name and date, and signs her/his name.	
11	**Comments:** The receiver writes any comments, as appropriate.	In particular, note if there are any discrepancies between the products that were returned and those received by the receiving facility.

The task is complete when—

- ❑ The name of the facility to which products are being sent and the name of the facility returning products are filled in.
- ❑ The description and quantity of products being returned, the expiry date, and the reason for nonuse are filled in
- ❑ The person filling out the report has written his/her name, signature, and the date
- ❑ The person transporting the products has written his/her name, signature, and the date.
- ❑ The person receiving the products has written his/her name, signature, and the date

For more information, please visit http://www.deliver.jsi.com

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