

# National HIV/AIDS Programs

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A Handbook on  
Supply Chain Management for HIV/AIDS  
Medical Commodities



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## **A Handbook on Supply Chain Management for HIV/AIDS Medical Commodities**

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## Acknowledgements

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## Acronyms

<b>ART</b>	Anti-Retroviral Therapy
<b>CCM</b>	Country Coordination Mechanism
<b>ELISA</b>	Enzyme-Linked Immunosorbent Assay
<b>EPI</b>	Expanded Programme on Immunization
<b>FDC</b>	Fixed Dose Combination
<b>FEFO</b>	First-to-Expire-First-Out
<b>IUD</b>	Intra-Uterine Device
<b>LMIS</b>	Logistics Information Management System
<b>MAP</b>	Multi-Country HIV/AIDS Program for Africa
<b>MOH</b>	Ministry of Health
<b>MSF</b>	Medecins Sans Frontiers
<b>NAC/NAS</b>	National HIV/AIDS Council/Secretariat
<b>NGO</b>	Non-governmental Organization
<b>PMTCT</b>	Prevention of Mother to Child Transmission
<b>SDP</b>	Service Delivery Point
<b>STG</b>	Standard Treatment Guidelines
<b>STI</b>	Sexually Transmitted Infection
<b>UNICEF</b>	United Nations Children's Fund
<b>VAT</b>	Value Added Tax
<b>VCT</b>	Voluntary Counseling and Testing
<b>WHO</b>	World Health Organization
<b>WHO/EDM</b>	World Health Organization/Essential Drugs and Medicines department

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## Preface

The handbook on supply chain management for HIV/AIDS commodities was written to assist program managers to plan and implement day-to-day management of all drugs and medical supplies for an HIV/AIDS program. Many of the suggested techniques described in this handbook are helpful to program managers starting to plan or scale-up provision of drugs and supplies for a HIV/AIDS program. Additionally, some of the information may be helpful to readers who are implementing a new program and may not have robust logistics systems in place. For other readers, this handbook may serve as a checklist of systems and procedures that need to be in place in order to manage the many of the health commodities required for the HIV/AIDS program.

Too often in-country management of supplies receives little attention, jeopardizing the delivery of these health commodities to the facilities that need them. The handbook focuses on the elements of in-country management of supplies, and should be used as a complement to the World Bank document HIV/AIDS Medicines and Related Supplies: Contemporary Context and Procurement Technical Guide (February 2004). While the range of commodities required for HIV/AIDS prevention, treatment and care programs include a wide range of commodities, both medical and non-medical, such as IEC materials, textbooks etc.; this manual does not specifically address the non-medical commodities. However, the principles of supply chain management are applicable for the management of these non-medical commodities.

This Handbook explains the basics of logistics and supply chain management for commodities that support HIV/AIDS programs. It seeks to demonstrate the importance of taking logistics considerations into account when planning for the scale-up of HIV/AIDS programs. The handbook provides practical guidelines for program managers, donors and other partners in planning for the management of commodities to support HIV/AIDS programs. However, the authors assume that the readers are familiar with logistics concepts. The reference section at the back of this manual provides a list of books and articles for those who would like to get general information on logistics and drug supply management

The handbook does not provide a rigid, one-size-fits-all template for supply chain management. Each country's HIV/AIDS program is different: individual country circumstances and levels of system development are unique and will require tailor-made policies and systems improvements. In light of this, the handbook will explore some of the lessons learned in the past few years of HIV logistics and provide general principles for management of HIV/AIDS medical commodities





# 1 Introduction to Supply Chain Management

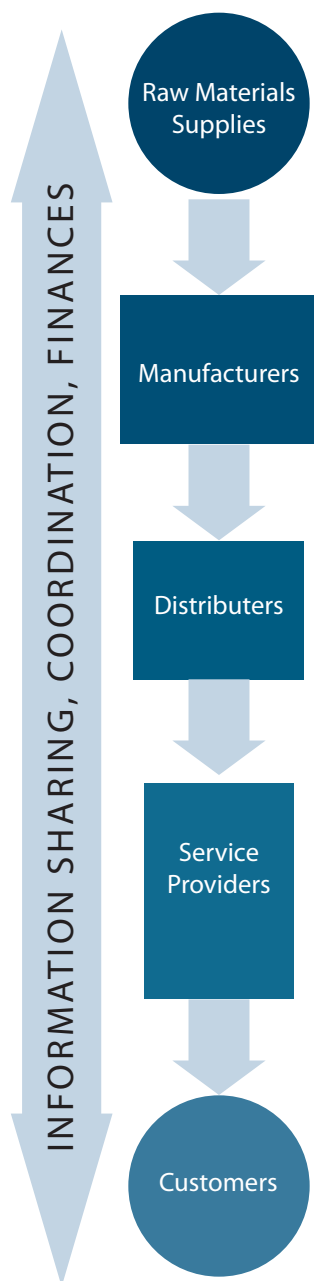
## 1.1 SUPPLY CHAIN MANAGEMENT

1. Life saving drugs such as anti-retroviral therapy and other critical supplies are becoming more accessible to the millions of people living with HIV. This has been in part due to the concerted effort of the international community, national governments, private industry, non-governmental organizations and others to improve the availability of supplies.
2. Experimental pilot programs are now being scaled-up to more comprehensive, national prevention, care and treatment programs. Many of these programs are now offering a full comprehensive continuum of care package of services that include prevention, treatment and care. In order to support these services, hundreds of medical commodities are required. The success of these nationwide programs will depend upon the ability to reliably and consistently supply the commodities to health facilities at all levels of the health system.
3. The consequence of supply interruption can be dire, including antibiotic and anti-retroviral drug resistance, which could have a wider global impact on the availability of drugs for treatment.
4. Medical health commodity supply chains are different because they usually have large, extended global pipelines, require high levels of product availability and have a high uncertainty in supply and demand.
5. It is therefore paramount that supply chain or logistics systems are treated as an important and critical function in getting the products to their destination. In fact, in order to sustain and expand the successful interventions experienced to date, the supply chains will need to be made more robust, agile and flexible through better management and increased investment of resources to achieve supply chain optimization.
6. The term *supply chain* describes the links and the inter-relationships among the many organizations, people, resources, and procedures involved in getting commodities to the customers (in this case, health care consumers). A typical supply chain would include partners from manufacturing, transportation, warehousing

### Key Concept

**Supply chains/ Logistics is an essential function in getting the products to the end-user.**

**Figure 1:  
Organizations  
Involved in the  
Supply Chain**



and, service delivery. Together, these organizations orchestrate the flow of *products* to the end-consumer, *information* for better planning and, *finances* to cover the transaction costs. A key ingredient of a successful supply chain is that partners are focused on improved *coordination*, *information-sharing* and, *servicing the end-customers*.

7. As shown in *Figure 1*, in health care, the supply chain participants usually include:

<b>Manufacturers</b>	Raw material suppliers pharmaceutical companies
<b>Procurement Agents</b>	Ministries of health, health administrative units, United Nations agencies, other procurement agents
<b>Distributors</b>	Transporters, central, regional and district medical stores
<b>Financiers</b>	Donors or funding agencies
<b>Service Providers</b>	NGOs and service delivery points (SDPs) such as hospitals, health centers and pharmacies

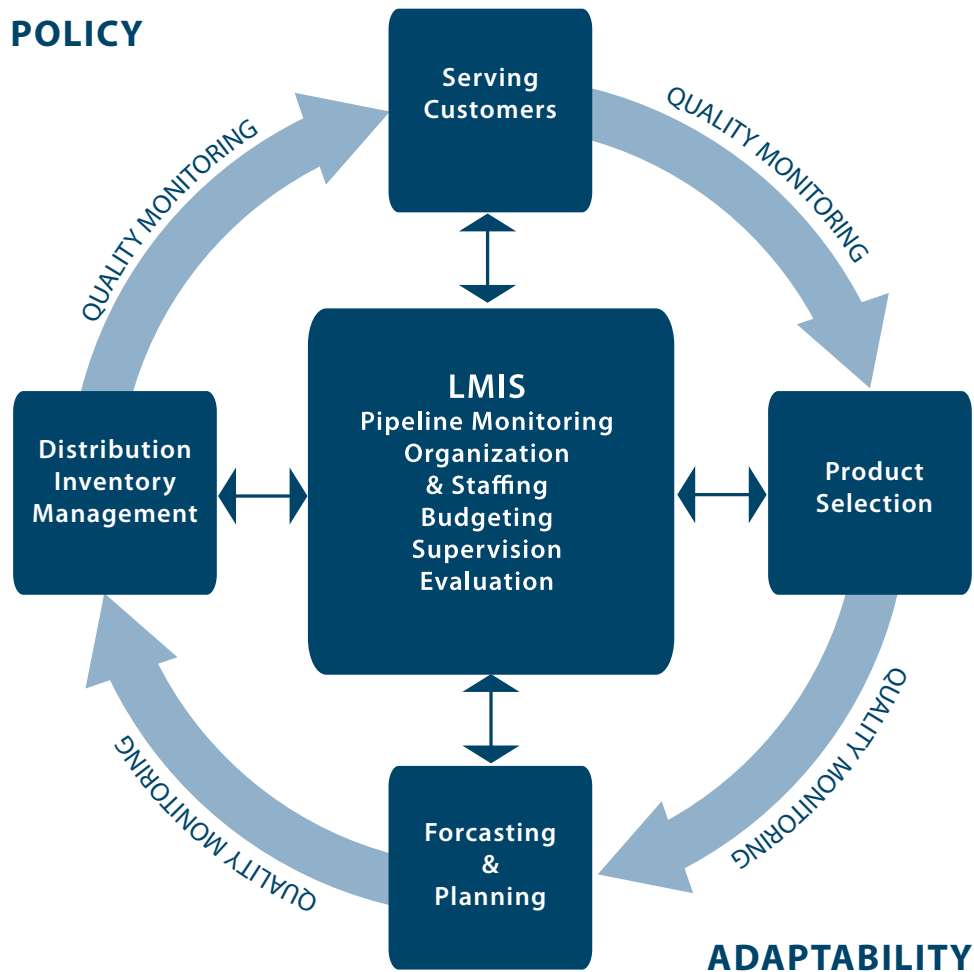
## 1.2 LOGISTICS

8. Logistics refers to the specific functions that need to be carried out by each of the supply chain partners such as selecting products, forecasting demand, procuring/ordering, warehousing/storing, managing inventory, transporting from one level to the next until the commodities reach the clients and, managing data.

9. A successful logistics system provides excellent customer service by fulfilling the *six rights*: procuring the *right goods*, in the *right quantity*, in the *right condition*, delivered to the *right place*, at the *right time*, for the *right cost*. In addition, for HIV programs, an excellent logistics system delivers the product to the *right customer*.

10. To manage a logistics system, a number of activities need to be continually executed and supported.

11. Figure 2, known as the *Logistics Cycle*, shows the activities and resources that are required to operate an effective logistics system. As the cycle portrays, each of the activities in the logistics cycle are inter-dependent on each other. Customers will not be served if there is a breakdown in one of the activities.

**Figure 2: The Logistics Cycle**

Source: DELIVER/JSI

12. While the activities of the logistics cycle are as applicable to HIV programs, the implementation of the logistics activities will be more complex because the programs are new, the need for HIV services is high and the systems in many of the countries on which these additional products need to be managed are weak. This challenge requires innovation in managing the logistics systems.

13. **SERVING CUSTOMERS.** The ultimate goal of any supply chain management or the logistics cycle is to serve customers. In fact, businesses around the world have shown that a customer-driven supply chains (in which all partners of the supply chain are focused on the customers) not only benefits the consumer, but also increases the profitability for all organizations involved in delivering the product to the consumer. In health care, patients are rarely treated as customers because demand for supplies usually exceeds availability. This problem becomes even more acute for HIV programs, where

**In Ghana, by re-engineering the logistics processes to be more customer-focused, the public sector reduced its lead-times for delivering health products to the health facility by half and consequently reduced the cost of the in-country pipeline.**

the supplies for expensive drugs such as ARVs are available only on a limited basis. However, if all the people and organizations involved in supply chain management are focused on serving the customer, not only the healthcare consumers would be better served; the overall costs of distribution can be reduced.

14. **PRODUCT SELECTION.** Any supply chain needs to identify the products it will be delivering through its pipeline. In many of the HIV programs, standard treatment guidelines or essential drugs lists that include HIV drugs and supplies may not be in place. Development of these guidelines would be one of the first steps to product selection. The generic World Health Organization (WHO) standard treatment guidelines can be used as a basis to start the process of developing country specific guidelines.

15. **FORECASTING AND PROCUREMENT.** Estimating the quantities of commodities enables program managers to plan budgets and procurement. However, for many of the HIV programs, the data needed to quantify the needs is usually not available. A best guess estimate can be made taking into account number of cases planned to be treated and service absorptive capacity. Procurement of HIV products is complex because of the legal issues related to patents, changing treatment regimes, ensuring quality to name a few. Purchasing the commodities through one of the WHO pre-qualified suppliers can reduce the burden of quality assurance. For new programs, forecast activities should be conducted almost weekly and products of high value procured regularly rather than conducting large volume bulk procurements. While the cost of this type of procurement practice may be high, the risk of over or under stocking could be minimized, especially in infancy programs where the number of clients, the best treatment options are not fully established.

16. **DISTRIBUTION.** Distribution includes storage, inventory management, transport, and re-ordering. These functions are important in getting the health commodities down to the service delivery points (SDPs) and ultimately to the consumers. For HIV programs, these activities will not only have to be managed effectively, but also efficiently due to the high costs or special requirements of the drugs and supplies. Striking the balance between maximizing service and minimizing the costs of the system is a continuous challenge for health program managers and more so of a challenge for HIV programs. Program managers should make decisions on total landed cost of delivering the health commodity and not on the unit cost of purchasing the commodity. For example, while bulk purchasing may achieve the lowest unit cost, it may not be the most cost-effective, if the bulk procurement increases the cost of warehousing and inventory management, making the total landed cost of the commodity more expensive.

17. Table 1.1, illustrates the importance of the logistics functions and possible delays in implementation of the function.

**Table 1.1: The Importance of Logistics Functions**

<b>Logistics Function</b>	<b>Importance</b>	<b>Cause of Delay</b>	<b>Strategies</b>
Product Selection	Specifies the products that need to be purchased	Lack of clinical protocols, guidelines or policy	Use WHO guidelines to develop protocols
Forecasting	Projects the total requirements for the short, medium and long term	Lack of data on the consumption patterns and/or stock levels in the country	Develop forecast based on the information available, taking into account number of cases to be treated and service absorptive capacity.
Procurement	Enables the products to be purchased.	Poor specifications. Incomplete projections. Unclear procurement procedures.	Install a LMIS as soon as possible Use WHO pre-qualified suppliers. Outline procurement process to be followed. Use flexible purchasing options
Storage	Stores supplies according to guidelines in order to ensure that the shelf life of the product is well-maintained	Storage staff not informed of the procurements that are expected in the pipeline. Storage guidelines not in place	Outline communication between procurement and storage staff. Develop a procedures manual, outlining storage guidelines.
Inventory Management	Enables program managers to know the stock levels	Lack of a system in place. Lack of stock cards.	Outline the system and inventory management procedures.
Transportation	Transports the commodities to its destination	Transport procedures unclear. Commodities transported as a secondary item as part of other programs.	Develop a transport management plan
Re-supply	Enables service providers to get refills	Transport managed on an ad-hoc basis Lack of procedures for the re-supply process	Outline re-order procedures
Serving Customers	Serves the patients and improves health outcomes	Lack of availability of products	Monitor stockouts at SDPs

### **1.3 FULL SUPPLY VERSUS NON-FULL SUPPLY**

18. In health care, ensuring that there are adequate drugs and supplies for every patient is paramount, as partial or intermittent treatment can lead to less than optimal results and in some cases, this can even be disastrous, both for the individual patient and the public at large. Among the untoward effects of this lack of uninterrupted treatment are treatment failure and the risk of developing drug resistance. This is a far more serious consideration in dealing with infectious diseases and in chronic ailments, which require continuous treatment in order to keep the disease under control. It is also the case for some preventive and health promotion programs such as in family planning and child health programs. The concept of “Full Supply” has been used to describe the products managed in the supply chains that manage commodities needed to support these programs. This description is a reference to the supply status that must exist in the supply pipeline to ensure that products are available at all service delivery points to ensure that there is no interruption in treatment of patients or clients. A product is therefore categorized as a full supply item when there is policy and programmatic commitment to provide adequate financial and other resources to apply rigorous logistics management techniques in forecasting, inventory control, ordering and receiving, among others to ensure that the supply pipeline is “full” at all times. This concept of full supply is not always applied and many countries manage drugs supplies by rationing systems. However, in the case of HIV treatment, rationing strategies cannot be used and once a patient is placed on treatment, there must be uninterrupted supply of drugs. Rationing could easily lead to treatment interruption and this could lead to treatment failure, drug resistance and a host of other problems, which would have a huge negative global impact. Ensuring full supply of drugs can be costly and requires additional strategies to optimize the use of resources.

19. Strategies for improving full-supply:

- Maximize all sources of funding through better coordination.
- Provide full and continuous treatment to fewer patients.
- Partner with manufacturers in providing timely forecasts and reducing uncertainty in planning and unplanned costs.
- Purchase in bulk to increase economies of scale, where possible. However, consider this strategy only in light of the total landed cost.
- Make the supply chain efficient resulting in fewer inventories tied in safety stock. This may require shortening the pipeline and delivering directly to the service delivery site, and not through intermediary warehouses.
- Reduce loss and pilferage by implementing a security system across the supply chain.
- Standardize and limit the number of drugs and supplies in the system.
- Reduce duplicative drugs and supplies.
- Implement an automated logistics information management system that tracks stock levels and consumption patterns, making the inventory transparent through the system.
- Monitor the use of drugs and supplies.

## 1.4 COMMODITY SECURITY

20. Ensuring continuous availability of health supplies is a challenge for program managers. The vulnerability of financing of supplies can be attributed to several factors that are usually beyond the sphere of influence of the program managers alone. Examples of such factors include change in donor priorities, health sector reforms, implementation of Poverty Reduction Strategies, and or use of sector-wide financing such as basket funding. Program managers can minimize these impacts, especially on availability of financing, by addressing the commodity management from a strategic perspective. This may include:

- Policy
  - Advocating that without products there will be no programs.
  - Actively participating in the implementation of the new reforms.
  - Involving other partners in the delivery of services such as non-governmental organizations.
  - Involving other NGOs and civic society to advocate and lobby on your behalf for commodity security.
- Resource Mobilization
  - Organizing a high-level multi-sectoral committee to continue to seek and advocate for long-term commodity financing.
  - Coordinating the financing available through the different resources.
  - Negotiating with other funders and donors on how best to spend the funds to reduce stockouts.
  - Continuously juggling the financing in order to reduce stockouts.
- Service Delivery
  - Segmenting the service provision and identifying the population that will be served through the public sector.
- Supply Chain Management
  - Hiring technical expertise in managing the forecasting and procurement functions.
  - Partnering with the suppliers.
  - Streamlining in-country distribution or even consider establishing an alternate distribution system.
  - Installing a logistics information management system that can improve information and planning.
  - Using the data generated by the information management system to make a case of need to increased funding.
- Human and Institution Capacity
  - Invest in creating a leadership for commodity security.
  - Invest in the infrastructure to make it effective and efficient.
  - Invest in the human capacity throughout the pipeline working in commodity management





## 2

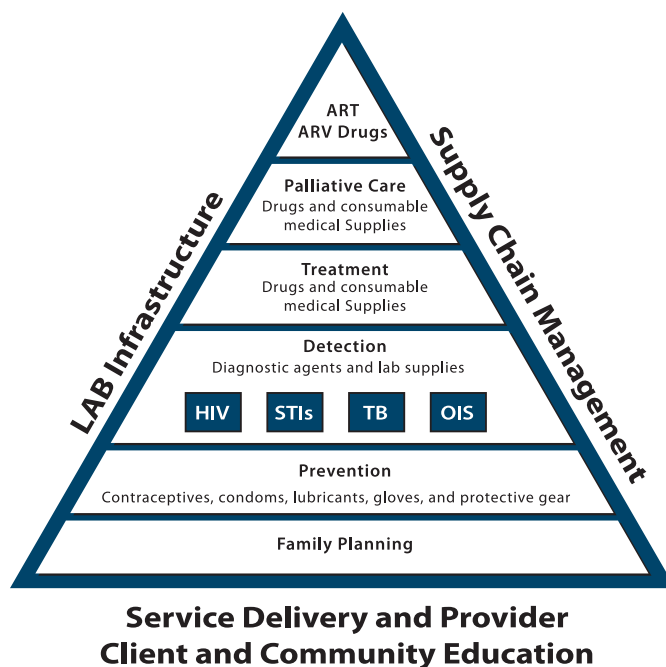
## Supply Chain Management for HIV/AIDS Programs

### 2.1 HIV PROGRAMS AND PRODUCTS

21. A comprehensive HIV/AIDS program will include a range of prevention, care and treatment interventions, also known as the continuum of care approach, addressing the needs to the people who are not infected to those who are and need long-term treatment over the course of their lives. These programs require an additional commodity volume estimated to be over two hundred or more of medical drugs and supplies. This increased volume can create stress on current over-taxed supply chains.

22. Figure 3 provides a diagram of the interventions that need to be supported in an HIV/AIDS program and also the infrastructure support systems required in the implementation of these interventions. As the diagrams shows, each of the interventions needs to be built on the others with the base being the prevention of HIV. Supply and use of these commodities also depends on support of a functioning laboratory infrastructure, active supply chain management and a planned and managed service delivery model with trained health care workers and an community outreach program.

**Figure 3: A Comprehensive HIV/AIDS Program.**



Source: DELIVER/JSI

### Key Concept

## No Product?

## No Program!\*

\*No Product? No Program. was coined by John Snow, Inc. to promote the importance of health commodity logistics, and is the motto of JSI's DELIVER project.

23. This model below provides another way to view the services that need to be provided to the different groups of people depending on their HIV sero-status.

**Table 2.1: HIV Services by HIV Sero-Status**

<b>STANDARD CARE SERVICES FOR HIV/AIDS</b>				
			<b>Palliative Care</b>	
			<b>Home-Based Care</b>	
	<b>Prevention of Mother to Child Transmission</b>		<b>Antiretroviral Therapy</b>	
	<b>Post Exposure Prophylaxis</b>	<b>Opportunistic Infection and Related Illness</b> Diagnosis, Treatments, Preventive Therapies		
	<b>Psycho-Social &amp; Spiritual Support</b> Individuals & Family... Care Providers... Bereavement... Orphans...			
<b>VCT</b>				
<b>Prevention</b> STI Services, Behavior Change Communication, Education, Universal precautions				
<b>Uninfected People</b>	<b>Exposed People</b>	<b>People Living with HIV</b>	<b>People Living with AIDS</b>	<b>Terminally Ill and Beyond</b>

Source: Joan MacNeil, Global HIV/AIDS Program

24. Steps to HIV commodity planning:

- Identify all the interventions that will be supported.
- Ensure, that the interventions build on each other, starting with the prevention activities as a base, and ensuring that all types of people are covered through the different HIV services, depending on their sero-status.
- Determine the number of people to be included in each of the interventions.
- Identify all the partners that will be providing the services.
- Map out the services to be offered by each site and number of people to be served at each service site and the organization that the service will be provided by.
- Make a list of all the health commodities that will be needed to support the intervention. Ask the various experts in the development of these lists. Do not forget accessories that may be required, such as pipettes etc.
- Streamline the commodity list by removing all duplicative products, i.e. a

- product that is the same in formulation and treatment.
- Review the list to make sure that the products are operationally easy to use by the site.
- Forecast the total commodities required for six month to one year.
- Estimate the budget required to purchase all the commodities.
- Review the forecasts and the budget and adjust the numbers according to availability of funds.
- Develop a procurement plan.

## **2.2 HIV PROGRAMS AND SUPPLY CHAIN MANAGEMENT**

25. Commodity management of HIV/AIDS programs is complex for the following reasons:

**Drug Resistance.** There is a high risk of developing drug resistance of very expensive drugs, which has global impact, if only intermittent or partial treatment is given. From a commodity perspective, these drugs have to be maintained in full-supply (i.e. full-course available for every patient on treatment).

**Rapidly changing technologies.** The drugs and medical supplies for HIV prevention, care and treatment are continuously being improved or becoming cheaper. In order for programs to take advantage of, supply chain functions such as procurement will have to be flexible to account for such changes.

**Lack of reliable data** on prevalence rates, service capacity and uptake make it difficult to adequately estimate future requirements based on historical data. Implementation of an automated Logistics Information Management System (LMIS) early in the program can help in data and commodity management.

**Stigmatization** and cultural barriers may impact number of people accessing services. Products forecasted<sup>1</sup> on the basis of targets such as prevalence rates will result in over-estimation of commodity requirements.

**Multiple venues for distribution.** HIV/AIDS programs often use non-traditional distribution sites, taking advantage of market segmentation for product distribution (public sector, social marketing, etc.). These alternative distribution mechanisms must be taken into account in commodity forecasts and planning.

**Short shelf-life** of some HIV/AIDS products such as test kits/reagents and ART drugs, increase the risk of loss due to expiry. Although technology is improving and product shelf life is improving, the shelf lives for these products remain relatively short as compared to most drugs and consumables. Shorter, flexible and agile pipelines for the delivery of these commodities to the end-point is vital. This may require setting up alternate distribution systems.

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<sup>1</sup> A forecast is an estimate of quantities needed to support future programming using projections based on current data.

**High value of products** requires higher levels of security throughout the supply chain. This can be better achieved if pipeline was short and the number of people touching the product is reduced.

**Multiple use.** Many drugs used for treating opportunistic infections can also be used for treatment of other diseases not related to HIV. In order to reduce stockouts, the forecasts should include these multiple uses.

**Cold or cool chain.** HIV test kits for blood safety programs require cold and/or cool chain storage; if these products are procured, the system must have adequate cold chain capacity.

**High possibility of counterfeit drugs.** Due to the high value of the ARVs, the supply chains need to be highly secure. In addition, there needs to be a quality assurance program in place that can test for counterfeit drugs and a system to inform the public and remove these fake drugs from the system.

**Supply chains need to extend down to the consumer.** For HIV/AIDS programs, the need for supply chains to reach to the household level, requires involving new partners, streamlining delivery, working with manufacturers to customize the packaging that it can be used with ease at the lowest level with little instruction as possible.

**Laboratory supply chains also need to be strengthened simultaneously.** More than any other public health program the need of a functioning laboratory services is crucial of blood safety, screening of opportunistic infections and determination of type of clinical care.

Table 2.2 outlines some of the specific issues related to the management of HIV/AIDS products that bring added complexity to the existing logistics system:

**Table 2.2: HIV Interventions, Logistics Complexity and Solutions**

Program	Logistics Complexity	Potential Solutions
Condom Distribution	Distribution of the condoms includes non-traditional places such as bars, hotels, etc.	Consider putting a social marketing program in place  Take alternative distribution sites into consideration when forecasting commodity needs
Volunteer Counseling and Testing	Many of the reagents that support testing have a short shelf life  Semi-rapid HIV test kits require additional accessories and bring an added management burden  HIV testing is conducted off-site. This requires a reliable logistics system to transport blood samples, testing results and requires clients to make multiple trips to the service center	Shorten the pipeline  Consider rapid-only tests  Consider rapid tests which can be used on site and provide same day results
Sexually Transmitted Infections	Some of the STI antibiotics are used for other diseases, especially when the general essential drug system does not have enough supplies	Consider meeting the supply needs for both STI and other diseases  Assist in developing a rationing strategy  Improve rational drug use
Palliative care	The drugs and supplies for palliative care can be used for other diseases	Consider meeting the total supply needs.  Assist in developing a rationing plan.  Improve rational drug use.
ART	ARVs are costly  ARVs have to be managed in full supply, otherwise there is a high risk of drug resistance  Cost of maintaining a full supply of products can be costly  Absence of government policies on treatment.	Secure the logistics system.  Plan for long-term financing.  Streamline the logistics system.  Establish national policies on ARV treatment to guide commodity requirements.

### 2.3 COMMODITIES FOR HIV PROGRAMS

26. Estimates of the total number of commodities required for HIV programs range from 200 – 400 or more drugs and supplies. Standard treatment guidelines determine the health commodities to be used. A comprehensive list of products both drugs and medical consumables should be developed by in-country experts responsible for the programs. Additional information on products and prices can be obtained WHO/EDM, UNICEF, UNAIDS and MSF.

27. To help with the planning of commodities, the following table can be used to identify the programs and commodities required to support that program. The table below only provides an illustrative list of drugs and supplies. Annex E provides a more detailed list. However, this table should be used only to guide a discussion in the development of a comprehensive list that needs to be developed in-country with experts in the respective field.

#### Thinking about the whole package

Thinking about the total bundle of supplies required is important – while expensive drugs may often dominate the dialogue, the availability of smaller-value items such as pipettes and gloves can make or break a program.

**Table 2.3: Illustrative List of Commodities by Intervention**

Type of Program and Interventions	Commodities	Practical Advise
Family Planning	<ul style="list-style-type: none"> <li>- Condoms (male, female)</li> <li>- Injectables</li> <li>- Pills (combines and projection-only)</li> <li>- Implants</li> <li>- IUDs</li> <li>- Sterilization</li> </ul>	<p>Limit the number of brands with the same formulary, as it makes the management of commodities from logistics and service delivery perspective difficult.</p> <p>Consider the whole market before determining the products that needs to be provided by the public sector</p>
Universal safety precautions	<ul style="list-style-type: none"> <li>- Sharp boxes</li> <li>- Cleaning supplies such as bleach</li> <li>- Latex gloves</li> <li>- Auto-disable injections</li> </ul>	<p>Bundle injection purchase with the product that needs to be administered.</p> <p>Ensure that cleaning staff are provided with protective gear.</p>

Type of Program and Interventions	Commodities	Practical Advise
VCT	<ul style="list-style-type: none"> <li>- Rapid HIV test kits</li> <li>- ARVs</li> <li>- condoms/family planning</li> </ul>	<p>Choose a rapid test that gives the result within the same visit.</p> <p>Buy tests that require the least amount to support accessories or refrigeration</p>
Blood safety	<ul style="list-style-type: none"> <li>- Test kits for transfusion transmissible infections, such as HIV and other blood borne pathogens (Hepatitis B Virus, Hepatitis C Virus, syphilis, others according to national guidelines), Immuno-haematology (hematocrit, white cell blood counts, blood group typing etc.)</li> <li>- Reagents and controls for tests</li> <li>- Collection consumables (blood bags, lancets, needles, syringes and plasters, disposable gloves- Colloids and crystalloids should be available for use as substitutes for blood transfusion</li> <li>- Cold chain equipment</li> <li>- Medical equipment such as readers, centrifuges, refrigerators</li> <li>- Medical equipment consumables such as test-tube racks, pipettes, pipette tips, and specimen tubes gloves, swabs.</li> <li>- Disinfectants and cleaning supplies, sharps disposal bins</li> </ul>	<p>Think of the whole package. The blood needs to be tested for HIV and also other pathogens. The blood will not be safe of use, if the other tests have not been conducted.</p> <p>Many of the items required for blood safety program are consumables that need to be replenished on a regular basis.</p>
PMTCT	<ul style="list-style-type: none"> <li>- HIV test kits</li> <li>- Nevaprine for adults</li> <li>- Nevaprine syrup of newborn</li> <li>- ARVs</li> <li>- Infant formula</li> <li>- Family Planning products</li> </ul>	<p>Use the PMTCT to connect women to other services that they may need such as ARV treatment, family planning.</p>



Type of Program and Interventions	Commodities	Practical Advise
Palliative Care	- Anti-fungal drugs - Anti-cancer drugs - Antibiotics, TB drugs	Many of the drugs and supplies for palliative care are also used in basic curative care. Forecasts of these supplies should also cover the other uses
ART	Protease Inhibitor Two Nucleosides	Use of fixed-dose combination formulations may increase adherence to often-rigorous regimens – which may help to reduce resistance as well.  Fixed dose combinations (FDCs) may also improve logistics management of commodities since the FDCs reduce the physical volume of products to be managed.
Home-based care	Basic over-the counter drugs and supplies	

For further information on drugs available for antiretroviral therapy see Médecins Sans Frontières. 2003. Untangling the Web of Price Reductions: A Pricing Guide for the Purchase of ARVs for Developing Countries, 5th Ed. Geneva: MSF.  
[www.accessmed-msf.org/documents/5theditionuntangling.pdf](http://www.accessmed-msf.org/documents/5theditionuntangling.pdf)

For updates and cost information see the WHO Prequalification Project Website:  
[mednet3.who.int/prequal/default.shtml](http://mednet3.who.int/prequal/default.shtml)

See also World Health Organization, UNICEF, UNAIDS, Médecins Sans Frontières. 2003. Sources and Prices of Selected Medicines and Diagnostics for People Living with HIV/AIDS. Geneva: WHO.  
[www.who.int/medicines/organization/par/ipc/sources-prices.pdf](http://www.who.int/medicines/organization/par/ipc/sources-prices.pdf)

# 3

## Logistics Management for HIV/AIDS Commodities

### 3.1 ASSESSMENT

28. A first step to strengthening the supply chain is to conduct a supply chain assessment to determine strengths and weaknesses of the systems. A good Commodity Logistics System Assessment will do the following:

- Identify and evaluate current systems.
- Assess both human and institutional capacity, especially for scale-up.
- Collect data that can also be used to advocate for sufficient resources and to monitor performance of the system over time.

29. The following rapid systems assessment tools are available online:

- Stages of Readiness (JSI/DELIVER)  
[www.deliver.jsi.com/pdf/g&h/readinesstool\\_final.pdf](http://www.deliver.jsi.com/pdf/g&h/readinesstool_final.pdf)
- Logistics System Assessment Tool (JSI/DELIVER)  
[www.deliver.jsi.com/pdf/g&h/lstatword.pdf](http://www.deliver.jsi.com/pdf/g&h/lstatword.pdf)
- Global Supply Chain Assessment Tool (GFATM)  
[www.theglobalfund.org/pdf/guidelines/pp\\_guidelines\\_procurement\\_supplymanagement\\_en.pdf](http://www.theglobalfund.org/pdf/guidelines/pp_guidelines_procurement_supplymanagement_en.pdf)

30. Programs need to consider a totally new approach to supply chain management. While it is important to assess the existing systems, the focus should be on how the systems can be dramatically re-engineered to deal with the volume and security these HIV commodities will require. Lessons from World-Class logistics systems should be considered as part of the strategy development of supply chain management.

### 3.2 POLICIES

31. The second step to planning or expanding HIV services is to identify the policies for the HIV program. Assess the impact of the policies on supply chain management. Examples of policies that would impact the logistics systems are:

### Key Concept

**Collection of baseline data on logistics systems capacity and performance can better inform the design, determine the resource requirements and provide monitoring and evaluation data.**

- Number of interventions to be offered
- Number of sites and types of service at each site
- Number of people to be served
- Clinical protocols to be followed
- Decisions on fee for service

### **3.3 SUPPLY CHAIN MANAGEMENT PLAN**

32. As part of the program planning:

- Make a list of all the products that will be needed to support the program.
- Develop a plan for the supply chain management, i.e. how will the products be procured, imported, stored and delivered to the sites. The logistics cycle can be used as a guideline.
- Consider world-class supply chain management options.

### **3.4 FINANCING**

33. Once all the program details have been outlined, assess the financing required. This step may require re-adjusting the program depending the cost of the programs. For commodities and supply chain management:

- Coordinate the available financing from all sources.
- Establish policies to maintain funding for commodities as well as for logistics management functions.
- Adjust the program targets if the financing is not available for the commodities or the supply chain functions.
- Ensure that the logistics costs are funded as part of the program (logistics costs can range as high as 38% of the estimated cost of medical goods).
- Start establishing a long-term plan for future financing of the programs, including the commodities and for supply chain management.

34. Additional strategies to address the financing of HIV programs can be learned from contraceptive security initiative funded by USAID. Additional information can be obtained on the initiative from [www.supplyinitiative.org](http://www.supplyinitiative.org).

### **3.5 EFFECTIVE PARTNERSHIPS**

35. Multi-sectoral partnerships are a key element for successful implementation of HIV/AIDS programs. Involving a broad partnership can improve effectiveness, if the roles of the different partners are clearly defined. Logistics management can benefit greatly from partnering with the private sector in programs such as benchmarking or contracting out logistics functions. Examples include private or parastatal central warehouse facilities, private transportation services and contracting procurement services to non-governmental or procurement agencies.

### **3.6 HUMAN AND INSTITUTIONAL RESOURCES**

36. The strength of a health commodity supply chain is dependent upon:

- Having assigned staff for logistics functions.
- Ensuring that the staff have the capacity to conduct the logistics functions.
- Having a logistics champion to ensure that logistics is moved from the “*backroom to the boardroom*”.
- Having clear logistics job descriptions.
- Providing the tools to the staff to be able to do their jobs.
- Providing clear job aids.
- Providing clear procedure manuals.
- Encouraging and empowering staff to take initiative to continually improve processes for each of the functions.
- Creating performance measures for the logistics functions, including timeliness of deliveries, product availability at health facilities, reduction of loss due to expiry, will increase the ability of the system to track progress.
- Building and strengthening monitoring and supervision.

### **3.7 WASTE MANAGEMENT PLAN**

37. The increased volume of drugs and consumables required to support HIV/AIDS programs brings with it an accompanying increase in the volume of waste at health facilities, putting a strain on the current waste management systems. With increasing emphasis placed on safe health care, medical waste needs to be proactively managed. Activities that need to be considered to improve waste management are:

- Assess and plan for waste management that reduces the risk to the community of transmission of bloodborne pathogens or other avoidable injury due to unsafe waste disposal.
- Contain the waste appropriately in order to protect workers and the community. This includes strategies such as use of safety boxes for disposal of used needles and other sharps.
- Plan for safe storage of waste prior to final destruction
- Implement a policy of waste segregation
- Make sure that the waste management plan has a strong custodian.
- Reward and provide incentives to staff working with waste management.



# 4 Product Selection

## 4.1 PRODUCT SELECTION FOR HIV PROGRAMS

38. Product selection is the critical first step in the management of commodities.

Step 1: Establish standard algorithms and treatment guidelines

Step 2: Review the selection of products in the algorithms to ensure that it currently meets the pharmacological requirements of the program, can be used by the current service capacity and the logistics management of the product is simple.

Step 3: Incorporate the new products in the essential drugs list

Step 4: Establish a committee that will periodically review and update the algorithms.

Step 5: Establish a streamlined process for review and updating the algorithms, especially since there is continuous and rapid change in product technology.

Step 6: Continually monitor for improved products in the market.

Step 7: Continually monitor the prices of these products.

Step 8: Establish a system to monitor the efficacy of the products in-country.

Step 9: Outline the registration process for the drugs to be imported in the country

Step 10: Establish a “fast-track” registration process

## 4.2 LOGISTICS PERSPECTIVE OF PRODUCT SELECTION

39. To minimize cost, improve quality and customer service, the following logistics considerations need to be taken into account in product selection:

- Find products that are easy for patients to use, have fewer side effects and require fewer trips to the health center.
- Standardize and limit the list of drugs and supplies.
- Eliminate products that require additional accessories.
- Eliminate products that are of duplicate nature.
- Find products that are easy to administer at the lowest level.
- If possible, seek options of fixed-dose combinations or co-blister packaging.

## Key Concept

**Forecasts are used to reduce planning uncertainty and take advantage of economies of scale.**

- Work with manufacturers to package the products for the lowest level of use.
- Find products that do not require special handling such as cold or cool chains.

### **4.3 ACTION ITEM CHECKLIST:**

- ✓ Ensure that MOH, MAP, CCC, and other national stakeholders to establish a national policy on HIV/AIDS prevention, treatment and care before any product selection activities take place.
- ✓ Assemble technical specialists such as MAP, CCM, MOH/HIV program managers, pharmacists, HIV clinical specialists, etc. and map out the interventions to be supported, including product selection decisions.
- ✓ Consider hiring a consultant firm, NGO or an individual consultant with experience in selecting pharmaceutical and diagnostic supplies for HIV/AIDS programs to work directly with the MOH and NAC to select the appropriate products.
- ✓ Establish HIV testing protocols and standard treatment guidelines for prevention, treatment for opportunistic infections, first-line and second-line ARV treatment and palliative care. Where possible, choose products that are easy for patients to use.
- ✓ List the required drugs and consumables for all aspects of HIV/AIDS programming included in the national policy.
- ✓ Consider selection of ART fixed dose combinations or co-blister packs.
- ✓ Ensure that selected products are consistent with the human and institutional capacity of the service delivery system.
- ✓ Consult with logistics staff to ensure that listed products can be managed successfully within the existing supply chain/human resource constraints or develop a strategy to gear-up the functions and capacity required for the management of these commodities.
- ✓ Ensure that selected products are registered in the country.
- ✓ Reduce/eliminate multiple brands of the same product to simplify and standardize handling and use.
- ✓ Reduce commodities that require additional accessories such as semi-rapid tests, if possible.
- ✓ Consider establishing a process to fast-track the registration of HIV/AIDS products.
- ✓ Know the impact of TRIPS and other trade laws on product selection.
- ✓ If necessary, plan for any system improvements that may realistically be implemented to manage new products.

# 5

## Forecasting

### 5.1 FORECASTING FOR HIV PROGRAMS

40. Forecasting is the process of estimating how much of the selected products the program will need to reach the population to be served. Forecasts are generally used to reduce planning uncertainty.

41. Forecasts enable program managers to plan the procurement and finances. A reasonable forecast should take into account:

- Goals/targets set by the HIV/AIDS programs,
- Realistic expectations for scaling-up,
- Absorptive capacity of the laboratory, service delivery and supply management systems,
- Past consumption, as well as,
- Current stock levels throughout the system.

42. Forecasting for HIV/AIDS programs that are immature is highly unpredictable because of rapidly changing technology, evolving service delivery models and the uncertainty of success of scaling-up.

43. Consequently, there is not much data available from routine health information systems or monitoring and surveillance systems to provide an accurate picture of past consumption of commodities.

44. In addition, some products are not used exclusively in HIV/AIDS programs, but are ‘cross-over’ products like condoms used for HIV prevention, STI prevention and family planning. Some products have multiple purposes within HIV programs, and all of these alternate uses of the products must be accounted for in the forecast, such as HIV test kits which are used for blood safety programs, clinical diagnosis, prevention of mother-to-child transmission (PMTCT), voluntary counseling and testing, and surveillance programs. Forecasts should also include accessory products, such as reagents and other additional supplies needed to conduct some HIV tests but which are not included in the test kit.

45. HIV programs require forecasting for over 400 items at a time. This type of analysis can be best done using a forecasting software.

46. One of the key interventions for improving forecasts is to

### Key Concept

**Forecasts are used to reduce planning uncertainty and take advantage of economies of scale.**



implement an automated logistics management information system (LMIS) that captures basic data on consumption patterns, stock levels and wastage. The costs of these systems may range as low as \$500,000 to over \$3million US dollars.

47. How much of emphasis to be placed in forecasting depends on the replenishment response time and economics of scale. Accurate forecasting should be a major focus for situations where there are long replenishment lead-time and high economics of scale.<sup>2</sup> For HIV programs, most of the commodities meet both the criteria of long lead-times and high economics of scale. Alternatively, where there is high uncertainty for products with high variation in demand, unknown consumption patterns, the programs may want to consider focusing less on developing accurate forecasts, but instead, focus on reducing lead-times and economics of scale through negotiating better pricing, making supplier arrangements that benefit both the supplier (manufacturer), the distributor (Ministry of Health) and the consumer. Other strategies include reducing the pipeline by distributing as directly as possible.

48. Because of the high uncertainty of demand for products, the forecast exercise should be taken on at least every one to six months.

49. In order to forecast:

- Identify all the people who are important in providing the intelligence required for the forecast. This many include program managers who are more aware of the program goals and the service absorptive capacity, Financers who have information regarding the budget and logistician who know the current stocks in country, demand and use of the products and supply chain absorptive capacity.
- Assess the availability of the data
- Select techniques for forecasting

**Table 5.1: Forecasting Management Process**

FORECAST MANAGEMENT PROCESS		
Forecast Database	Forecast Process	Forecast Users
Consumption patterns	Forecast methodology and techniques for analyses	Program Mangers
Morbidity patterns		Logisticians
Service statistics		Financers
Program Goals		

<sup>2</sup> David J. Class, and McConnell John. Forecasting and Its Uses in Logistics: understanding the applications, components, process , techniques, needs, benefits, and measures of forecasting. Council of Logistics Management 2003.

## 5.2 FORECAST METHODOLOGIES FOR HIV PROGRAMS

50. Forecasting methodologies are different for different products and different situations. It is important to keep in mind that a forecast is only as good as the data it's based on. There are three recognized methods for determining the quantities needed to support health programs.

51. Consumption-Based Forecasting. Data from a well-functioning LMIS<sup>3</sup> often results in far better and more accurate forecasts, ensures rationality in the system and reflects actual use patterns. Mature HIV/AIDS programs that have been managing commodities successfully and have well developed LMIS are encouraged to use data on consumption to inform their commodity forecasts. While the consumption method is the preferred method, drawbacks include potentially under-estimation of the actual need, especially if patients do not get the products due to stockouts. It may also perpetuate irrational use of products by continuing to supply based on past irrational consumption.

52. In the absence of good logistics data, morbidity statistics, prevalence and incidence rates demographic data and standard treatment guidelines can be used to calculate quantity requirements.

53. Morbidity-Based Forecast. This method is most used for new programs in which there is no existing consumption data on which to base the forecast. This method assumes rational use of drugs based on the standard treatment guidelines.

54. Adjusted Consumption-Based Forecast. In most situations, a combination of methods will be used. This method is used when neither the logistics data nor morbidity data are particularly reliable. Extrapolating good quality consumption data from a region or country with stronger systems onto the population and service profiles of the target area to extrapolate the expected need of the target area are the basic elements of the adjusted consumption method of forecasting.

55. To improve the forecasts:

- Use two different methods to calculate a forecast so that results can be crosschecked.
- Update those projections regularly (at least every month or six months)
- Implement an automated LMIS.

56. For any of the methods used, the following factors should also be taken into account in the final forecast:

- Current stock levels,
- Service delivery capacity,

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<sup>3</sup> See Chapter 8 titled: LMIS

- Laboratory capacity,
- Supply chain capacity
- Wastage factor

57. A number of guidelines and tools have been developed to assist in forecasting for HIV/AIDS commodities. These include:

- Quantification tool for HIV Test Kits: *ProQ* (JSI/DELIVER)  
[www.deliver.jsi.com/2002/software/proq/index.cfm](http://www.deliver.jsi.com/2002/software/proq/index.cfm)
- SPECTRUM (Futures Group)  
[www.futuresgroup.com/WhatWeDo.cfm?page=Software&ID=Spectrum](http://www.futuresgroup.com/WhatWeDo.cfm?page=Software&ID=Spectrum)
- MSH/FHI VCT Commodity Management Guide  
[www.fhi.org/en/HIVAIDS/pub/strat/vctcommodity.htm](http://www.fhi.org/en/HIVAIDS/pub/strat/vctcommodity.htm)

### **5.3 ACTION ITEM CHECKLIST**

- ✓ Ensure that HIV/AIDS technical specialists are responsible for HIV/AIDS commodity forecast
- ✓ Assess how much effort will be placed in the development of accurate forecasts versus addressing other factors such as reducing lead-time or economics of scale.
- ✓ Consider hiring a consultant firm, NGO or individual consultant with expertise in forecasting for HIV/AIDS and other health commodities to assist national technical specialists in the forecasting exercise
- ✓ Gather the appropriate data (consumption, stock on hand, losses and adjustments, population/demographic data, morbidity statistics, prevalence rates, service capacity and catchment populations, etc.)
- ✓ Choose a forecasting methodology(ies) for the various products based on age of program and data availability
- ✓ Where possible, use issues data (data on quantities sent from one level of the system to another level) from the lowest level available
- ✓ Account for multiple use products and complementary products and accessories
- ✓ Ensure that forecast takes into account system capacity – both service capacity and supply chain capacity
- ✓ Update forecasts regularly to keep up with rapidly changing service expansion and disease trends

## 6

## Procurement and Financing

### 6.1 PROCUREMENT AND SUPPLY CHAIN MANAGEMENT

58. Procurement is the process by which goods or services are purchased – in this case, drugs and consumables. World Bank procurement policies and procedures are outlined in great detail in *Battling HIV/AIDS: A Decision-Maker's Guide to the Procurement of Medicines and Related Supplies* (February 2004). This chapter will serve to highlight implications that procurement procedures may have on the in-country management of HIV/AIDS commodities.

59. Procurement needs to be managed with high degree of flexibility because:

- Demand of the products is uncertain, since the programs are new and consumption patterns have not been established and lack of data results in speculative forecasts;
- Lengthy and inflexible lead-times in the procurement process will inevitably lead to wastage of high-value products.
- Technology and prices of these products are continuously evolving.

60. Flexibility in procurement can be obtained through the bid specification process. The strategies outlined below can be incorporated into the bid specifications.

61. Increased flexibility of procurement processes might involve:

- Scheduling more frequent deliveries of commodities
- Establishing framework contracts by which the overall quantity is set for a specified contract duration (e.g. 1 year), but orders are placed at shorter intervals throughout the contract period based on changing program needs
- Exploring the option of short-term contracts, such as 6-month contracts. This may result in an increased administrative burden, but it would provide the maximum flexibility. Short-term contracts may be feasible if implemented in conjunction with streamlined procurement processes.

### Key Concept

**Focus in reducing lead-times in procurement process – this will reduce the inventory required for safety stock and less dollars tied into the inventory.**

- Limiting procurement to a pre-qualified list of suppliers. WHO has assembled a pre-qualified suppliers list for HIV/AIDS commodities such as test kits and ARVs. Pre-qualification can take some of the burden of investigating and quality testing off already overtaxed country procurement units.

62. Apart from streamlining the steps in the procurement process and allowing for more flexible contracting mechanisms, procurement staff need to:

- Work with the experts to develop precise technical specifications. This will reduce the need for amendments.
- Take into account the storage and handling capacity in the procurement plans.
- Communicate to the warehouse staff, regarding the status of a procurement. This would enable warehouse staff to plan the space for the commodities.
- Outline the registration and port clearance process
- Determine if VAT or other associated importation duties are applicable
- Build in-country capacity for procurement procedures
- Streamline procedures in order to reduce lead-times. Reduction in lead-times will also reduce the total inventory that needs to be held for safety stock, which reduces capital tied in inventory.

63. The length of the procurement process and policies can have an impact on the level of inventories a system needs to hold as safety stock. Examples of bottlenecks and barriers that impact commodities from coming into the country are: unclear or lengthy customs regulations, port clearance and requirements of payments for tariffs and taxes. New public sector procurement reform strategies can also impact lead-times as the main purpose of these reforms are focused in improving competition and transparency and not necessarily reducing lead-times.

64. Pooled Procurement. Other innovations include pooled procurement of commodities on a regional or sub-regional level to improve individual countries ability to take advantage of economies of scale and competitive pricing. Feasibility studies are currently underway to determine the strengths and weaknesses of this approach to procurement for HIV/AIDS commodities.

## **6.2 FINANCING**

65. Financing of HIV/AIDS commodities will be a continuous challenge because of the high costs and the huge demand. In most cases, programs will receive HIV commodities from multiple sources and mechanisms. It may be advisable to assign a full-time coordinator to manage the financing and coordination of the commodities. Some of the responsibilities of the full-time coordinator would be to:

- Effectively argue the need to focus on effective coordination as a key sustainability strategy.

- Develop medium to long term financing plan
- Use the forecasts to advocate for appropriate financing
- Build advocacy capacity to leverage donor resources for commodity availability.
- Communicate and coordinate with other donors and funding agencies
- Align funding and procurement cycles
- Ensure that the policy-makers are continuously aware of the stock situation in the country.
- Juggle donor resources to ensure that the commodities are maintained in full and continuous supply.
- Advocate that the logistics management costs are also financed. (it is recommended that 15 – 25 percent of the commodity costs be set aside for logistics management).

### **6.3 DONATIONS**

66. Donation programs can be useful in addressing some of the commodity needs. There are many programs offering free HIV commodities. A list of some of these donation programs can be found on: [www.pqmd.org/resources\\_fm.html](http://www.pqmd.org/resources_fm.html).

67. In addition, WHO's Guidelines for Drug Donations provide important information for planning donations.

[www.who.int/medicines/library/par/who-edm-par-1999-4/who-edm-par-99-4.pdf](http://www.who.int/medicines/library/par/who-edm-par-1999-4/who-edm-par-99-4.pdf)

### **6.4 ACTION CHECKLIST**

- ✓ Involve the representatives of key procurement specialists/agencies in the country, including the procurement units supporting the MAP project, in the implementation of public procurement processes.
- ✓ Hire a consultant specialized in the procurement of medicines and supplies and/or in the legal matters of ARVs (if needed)
- ✓ Involve ministry of finance and donor representatives as treatment requires sustained funding from all possible sources
- ✓ NAC should support the coordination and alignment of procurement and financing cycles to ensure a continued product supply.
- ✓ Prepare financing and budgeting plans and implementation strategy (ies) that is acceptable to all key stakeholders
- ✓ Procurement specialists should support the building of in-country procurement capacity
- ✓ Coordinate with the ministry of finance and other donors to facilitate complementary procurement practices and to advocate for sustainable funding for HIV/AIDS commodities
- ✓ Simplify and streamline procurement procedures where possible

- ✓ Increase flexibility of procurement procedures to allow more frequent shipments and purchase of new technologies as they become available
- ✓ Budget an additional 15 to 20 percent of commodity costs to cover in-country logistics management costs
- ✓ Ensure that customs policies allow for the quick transfer of drugs from port to warehouse to facilitate their efficient distribution
- ✓ Communicate and coordinate with donors to ensure that any donated products meet country needs and policy guidelines

# 7 Storage and Distribution

## 7.1 WAREHOUSING/STORAGE

68. In many supply chains, warehousing/storage costs can sometimes account for the largest percentage of overall logistics costs. It is vital that this function is managed effectively and efficiently. The shelf-life of the products is dependent on good storage practices. The Table 7.1 below provides an example of good storage practices.

**Table 7.1: - Storage Guidelines**

Clean and disinfect storeroom regularly
Store supplies in a dry, well-lit and well-ventilated storeroom, out of direct sunlight
Secure the storeroom from water penetration
Ensure that fire safety equipment is available and accessible, and that personnel are trained to use it
Store condoms and other latex products away from electric motors and fluorescent lights
Maintain cold storage, including a cold chain, for products that require it
Keep high value, narcotics and other controlled substances in a locked place
Store flammable products separately using appropriate safety precautions
Stack cartons at least 10 cm (4 in) off the floor, 30 cm (1 ft) away from the walls and other stacks, and no more than 2.5 m (8 ft) high
Store medical supplies separately, away from insecticides, old files, chemicals, office supplies and other materials
Arrange cartons so that arrows point up, and ensure that identification labels, expiry dates, and manufacturing dates are visible
Store supplies in a manner accessible by FEFO, counting and general management
Separate and dispose of damaged or expired products without delay.

Source: John Snow, Inc. 2000. The Logistics Handbook: A Practical Guide for Supply Chain Managers in Family Planning and Health Programs. Arlington, VA: JSI.

69. In addition to good storage practices, HIV/AIDS commodities could be better managed by implementing the following strategies:

- Reduce the number of intermediate storage points in the

## Key Concept

**Logistics functions can only operate effectively and efficiently if it is properly financed – approximately 15 – 25 percent of the cost of commodities.**



supply chain, such as regional and district warehouses. Instead devise a system that delivers directly to the SDP, reducing storage costs, inventory levels and decrease in product loss and expiry. This could be done through direct shipping from the manufacturer to the service delivery site.

- Increase security throughout the supply chain, for the high-cost ARV products. Security measures may include assigned dedicated staff responsible for the stocks, locking storage facilities for the products throughout the supply chain.
- Consider the use of automated warehouse technologies to assist in the management of the additional volume of products for HIV.
- Assess and develop a streamlined picking, storing and packing flows in huge warehouses that will improve productivity and quality.
- Implement a cold chain system for support blood safety programs. Learn from the EPI program on maintenance of a cold/cool supply chain. Do not assume that EPI refrigerators can be used by HIV programs.

## **7.2 ORDER MANAGEMENT**

70. Placing orders for replenishment is a routine activity in logistics. This is a critical step in ensuring that supplies are continuously available. Without clear re-ordering procedures, the health-workers do not know when to order more supplies and inventory management, which is strongly tied to order management becomes difficult to manage. Program managers can immediately address this problem, by having clear, written procedures for re-ordering supplies.

71. Re-order management can be done using a push or a pull system.

- Push system: the personnel receiving the supplies determines the quantities required.
- Pull system: the personnel issuing the supplies determine the quantities required.

72. It is important to understand that the pull system is not any better than the push system. The choice of the system to implement is dependent on the availability of staff skills at each level, use of information technology, adequate products in the system and general approach to administration.

73. In the following situations it may be better to use one system or the other:

- Limited supplies and need for rationing the supply – push system
- Overworked staff at the lower levels – push system
- Decentralization reforms, transfer of management responsibility to the lower level – push or pull system
- Highly automated system – push or pull

## **7.3 INVENTORY MANAGEMENT SYSTEMS**

74. Inventory systems enable store-keepers to manage their stock – know how much stock to hold, when to order and how much to order. There are three types of Maximum-Minimum inventory control systems:

- Forced-ordering Max-Min system
- Continuous Review System
- Standard Min-Max System<sup>4</sup>

75. The choice of the inventory system will be dependent on several factors:

- The number of products to be handled in the system.
- The strength and flexibility of the transport system
- Workloads of the staff in the system.

#### **7.4 TRANSPORTATION**

76. Transportation is an essential function in logistics for delivering the commodities to the health facility level. In many of the public sector logistics system, not enough attention is given to the development of the transport system specifically for delivering products. However for HIV/AIDS program, more attention will need to be paid to transport systems because of the nature of the supplies being high-volume, high-value and some with short shelf lives. As a result, transport systems need to be managed with **better security** and; **efficiently** in order to reduce lead-times, which can directly impact the amount of inventory the system needs to carry.

77. In many countries, transportation is the weakest link which if not addressed impacts the inventory, order management and customer service. Transportation systems can no longer be managed on an ad-hoc basis but need to be managed as a scheduled delivery system. This means that programs need to either invest in transportation systems or seek for options to outsource this function to private companies that can ensure timely, regular delivery.

##### **Country Example**

##### **Kenya LMIS for STI Kits: The Value of Consumption Data**

DFID provided 2,538 STI kits to Kenya's MOH and based on historical logistics data, estimated that the kits could service 163 STI delivery sites – all of Kenya's hospitals and one-third of the country's health clinics – for one year. Using a designed software to track consumption hospitals and clinics, the MOH developed a secure distribution system that delivered products based on actual use. The software helped calculate when each site needed its next supply of kits, thus preventing drug shortages and expiration. The new system was so efficient that the initial supply of STI kits covered three times as many sites for twice as long as anticipated. Drugs that were expected to last 12 months for 163 sites lasted 29 months for more than 500 sites.

78. Some of the system-wide strategies for addressing the transportation function include:

- Developing a transportation policy

<sup>4</sup> To understand which and how to apply these systems, see chapter 4 of the The Logistics Handbook: A Practical Guide for Supply Chain Managers in Family Planning and Health programs. Arlington, Va.: Family Planning Logistics Management/John Snow, Inc. for the U.S. Agency for International Development (USAID). [www.deliver.jsi.com/PDF/g&h/LogisticsHandbook.pdf](http://www.deliver.jsi.com/PDF/g&h/LogisticsHandbook.pdf)

- Developing a transport resource management plan
- Putting in place a scheduled transport delivering system
- Eliminating parallel or duplicate trips to the same destination.
- Outsourcing some or all transportation functions<sup>5</sup>

79. Integration of the HIV products in the current delivery systems needs to be done with caution, as many of these distribution systems are managed sub-optimally. Unless the ministry of health is willing to dramatically re-engineer the existing system and invest in optimizing the supply chain functions, HIV/AIDS products many need to consider more responsive, agile and flexible logistics system.

80. These alternate solutions could be establishing parallel distribution systems, outsourcing, removing intermediary warehouses in the system. Examples of these systems could include use of express package distribution service, having the manufacturers deliver it directly to the facility site.

## **7.5 ACTION CHECKLIST**

- ✓ Consider hiring a consultant firm, NGO or individual consultant to assess and analyze storekeeping practices and develop storage system improvement strategies.
- ✓ Ensure the availability of storage space for commodities, including cold chain capacity. If applicable, consider “dejunking” storage facilities to free up storage space.
- ✓ Establish security measures to protect supplies from theft (standard national procedures, locks, guardians, etc.)
- ✓ Observe good storekeeping practices, utilizing First-to-Expire-First-Out (FEFO)
- ✓ Consider automating the inventory control system where possible.
- ✓ Adapt an agile inventory control systems for HIV/AIDS commodities that can easily changed to increased or decreased demand patterns and other systems constraints. This may mean piloting the use of PDAs or other wireless technology.
- ✓ Choose an ordering system based on the following considerations: number of products, transport system, reporting system, human capacity in logistics at the various levels of the system, supervisory systems and storage capacity.
- ✓ Properly plan and resource transport systems. Consider development of a scheduled delivery system and possibly outsourcing this function to the private sector.
- ✓ Asses and plan for capacity, fleet maintenance and usage of vehicle fleets.
- ✓ Optimize the supply chain system first, if the HIV/AIDS products are to be integrated as part other health commodity supply chains.

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<sup>5</sup> One source of for information on transport management can be obtained through [www.transaid.org](http://www.transaid.org)



## Logistics Management Information Systems (LMIS)

### 8.1 MANAGEMENT OF LOGISTICS DATA

81. A logistics management information system, or LMIS, provides information on the stock status, between levels of the health system. LMIS can be either paper or other forms of communication to transfer data which can improve day-to-day management of commodities and inform forecasting and procurement decisions at the national level.

82. In designing LMIS for the management of HIV/AIDS commodities, a critical step is deciding what information to collect. What data will be collected, by whom, and how often are critical elements in LMIS, and will depend on the individual situation.

83. A logistics management information system uses standard types of forms for recording the essential data items. These are:

- Stock keeping records such as stock (or bin) cards,
- Transaction records such as requisition and issue vouchers, and,
- Consumption records such as a daily activity record which tallies the amount of each product used or dispensed to patients each day.

84. Stock keeping and consumption records remain at the facility, and are used to calculate the amounts requested on transaction records. Transaction records move between levels of the system, and are used as order forms and to track and confirm shipments between levels.

### 8.2 MANUAL AND AUTOMATED SYSTEMS

85. LMIS can be a paper-based system, also known as a manual system or an automated electronic system. Automating the system may be dependent on staff skills and the total number of products to be managed.

86. For HIV/AIDS programs, some automation of the system is required, as managing 300+ items can become very unwieldy.

### Key Concept

**Logistics Information Management System for a large number of products needs to be automated.**

87. In addition, the program will have to do some type of ABC analyzes to determine which commodities needs to be managed with more detail. It is recommended that, due to the high volume of commodities, staff be required to record exact consumption data on the few high-value products used for HIV/AIDS programs (approximately 20 percent of managed products) and to simply collect approximate dispensed data on other lower-value commodities (the remaining 80 percent of products). Experience has shown that a relatively small number of products make up a relatively high proportion of overall product value. The results of ABC Analysis, which categorizes products by their contribution to overall product value, can guide decisions on which commodities to track closely.

### **8.3 ACTION CHECKLIST**

- ✓ Planning for the LMIS should begin after the initial assessment of the system takes place
- ✓ Assemble an LMIS team of HMIS, LMIS, MAP M&E and MOH representatives to assess the current information system and develop improved systems.
- ✓ Ensure that LMIS systems which are systems for day to day management are not mixed with HMIS systems which serve a broader goal of strategic health planning.
- ✓ Consider hiring a consultant firm, NGO or individual consultant specializing in MIS, particularly if computerized systems are being considered
- ✓ LMIS should be in place before any products are distributed.
- ✓ LMIS should be kept as simple as possible, collecting at minimum the essential data for running the program.
- ✓ LMIS can be manual paper-based systems, automated systems or a combination of the two. The choice of system will depend on in-country system and human resource capacity, however, where possible opt to automate the system.
- ✓ Automate the system as it will help in managing data large number of products handled under an HIV/AIDS program.

## 9

## Quality Assurance

### 9.1 QUALITY ASSURANCE THROUGH THE SUPPLY CHAIN

88. Quality of the products need to be maintained throughout the supply chain, starting from the manufacturer, all the way through the distribution network until it is consumed by the patient. As the logistics cycle shows, quality assurance program needs to be in place throughout the cycle.

89. Examples of quality assurance program include:

- Requiring that the manufacturers comply with Good Manufacturing Practices (GMP) standards.
- Purchasing commodities from pre-qualified suppliers.
- Contracting an independent laboratory to conduct random quality testing of the products before they arrive in the country or through the pipeline.
- Establishing standards and procedures for in-country management of commodities for quality assurance, such as standardizing and maintaining proper storage and handling guidelines at all levels of the system will help to ensure product integrity.
- Establishing a quality assurance and consumer product complaint system.
- Continuously monitoring and supervising operations of the supply chain.
- Implementing a recall mechanism/process.
- Educating consumers on quality assurance, such as proper storage, use and discard.

### 9.2 ACTION CHECKLIST

- ✓ Make quality a central focus of all activities throughout the product management process by outlining quality assurance measures with all technical groups and in national policies and procedures during product management
- ✓ Use a pre-qualified suppliers list when possible
- ✓ Implement quality testing practices of a sample of commodities entering the country
- ✓ Ensure proper handling and storage of all commodities to avoid waste due to expiry, damage or exposure to the elements or pests.

### Key Concept

**Quality Assurance needs to be maintained throughout the supply chain**

- ✓ Minimize the number of products and brands
- ✓ Have a procedure in place to deal with product recall.
- ✓ Educate consumers on quality assurance.

# 10 Monitoring and Benchmarking

## **10.1 MONITORING THE SUPPLY CHAIN**

90. Logistics monitoring is imperative if programs want to know whether logistics operations are enhancing service delivery, providing enough—not enough -or too much products or whether the logistics organization is aligned with the program goals.

91. Through active monitoring and measurement, logistics systems can show achievement of program goals, reduce costs and be instrumental in improved service delivery – which all results in improved consumer confidence in the health care system.

92. Successful measurement program is hard work and demands commitment. While there are hundreds of ways to track logistics performance, it is important to focus the indicators that have the following characteristics:

- Quantitative – is measurable
- Motivates “correct” behavior
- Defined mutually by the parties concerned
- Multi-dimensional – balanced between quality, utilization and performance
- Benefits of the measure outweigh the costs of collection and analysis.

93. Most logistics systems in the commercial world use some form of a metrics or a score-card to measure the operations of the logistics system. These metrics are designed to align the program goals and the contribution of each of the logistics function to the goals. It also usually is holistic, covering measurement of all aspects of logistics performance such as time, cost, quality and others such as productivity.

94. Table 10.1 is an example of a chart adapted from the commercial sector that could be used to measure HIV/AIDS logistics performance. If you want further information on developing a matrix or how to calculate the indicators, please contact the authors.



Table 10.1: HIV/AIDS logistics performance.

	Procurement	Forecasting	Transportation	Warehousing	Inventory Management	Order Management	Customer Service
Quality	Perfect Order	Forecasting Accuracy	Order Fill Rate Reduction in exception management	Order Shipping Accuracy Claims free-order fulfillment	Inventory Accuracy Rate	Fill rate Processing Accuracy	Stockout rate
Cost	Total cost to Procure Cost of Purchase order cycle time	Cost of forecast inaccuracy	Transportation cost	Cost of excess capacity or cost of capacity shortfall	Inventory carrying costs Inventory Turns		Total landed cost
Time	Procurement processing lead-times	Forecasting/ Planning Cycle time	On-time Delivery/ Receipt Vehicle down time	Order cycle time		Order cycle time	Service waiting time
Other		Cash to cash cycle time					

## **10.2 ACTION CHECKLIST**

- ✓ Determine the overall program goals
- ✓ Select a range of indicators that measures a multi-dimensional aspects of process, such as quality, cost , time etc.
- ✓ Choose very few indicators that focus on changing the behavior of workers in the system.
- ✓ Review the indicators periodically and change them according to the goals and needs of the system.
- ✓ Have a champion for the measurement strategy.
- ✓ Use the measurements to start a benchmarking program.



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## Annex B: Action Item Checklist for HIV/AIDS Logistics Management

### **Product Selection**

- ✓ Ensure that MOH, MAP, CCC, and other national stakeholders to establish a national policy on HIV/AIDS prevention, treatment and care before any product selection activities take place.
- ✓ Assemble technical specialists such as MAP, CCM, MOH/HIV program managers, pharmacists, HIV clinical specialists, etc. and map out the interventions to be supported, including product selection decisions.
- ✓ Consider hiring a consultant firm, NGO or an individual consultant with experience in selecting pharmaceutical and diagnostic supplies for HIV/AIDS programs to work directly with the MOH and NAC to select the appropriate products.
- ✓ Establish HIV testing protocols and standard treatment guidelines for prevention, treatment for opportunistic infections, first-line and second-line ARV treatment and palliative care. Where possible, choose products that are easy for patients to use.
- ✓ List the required drugs and consumables for all aspects of HIV/AIDS programming included in the national policy.
- ✓ Consider selection of ART fixed dose combinations or co-blister packs.
- ✓ Ensure that selected products are consistent with the human and institutional capacity of the service delivery system.
- ✓ Consult with logistics staff to ensure that listed products can be managed successfully within the existing supply chain/human resource constraints or develop a strategy to gear-up the functions and capacity required for the management of these commodities.
- ✓ Ensure that selected products are registered in the country.
- ✓ Reduce/eliminate multiple brands of the same product to simplify and standardize handling and use.
- ✓ Reduce commodities that require additional accessories such as semi-rapid tests, if possible.
- ✓ Consider establishing a process to fast-track the registration of HIV/AIDS products.
- ✓ Know the impact of TRIPS and other trade laws on product selection.
- ✓ If necessary, plan for any system improvements that may realistically be implemented to manage new products.



## ***Forecasting***

- ✓ Ensure that HIV/AIDS technical specialists are responsible for HIV/AIDS commodity forecast
- ✓ Assess how much effort will be placed in the development of accurate forecasts versus addressing other factors such as reducing lead-time or economics of scale.
- ✓ Consider hiring a consultant firm, NGO or individual consultant with expertise in forecasting for HIV/AIDS and other health commodities to assist national technical specialists in the forecasting exercise
- ✓ Gather the appropriate data (consumption, stock on hand, losses and adjustments, population/demographic data, morbidity statistics, prevalence rates, service capacity and catchment populations, etc.)
- ✓ Choose a forecasting methodology(ies) for the various products based on age of program and data availability
- ✓ Where possible, use issues data (data on quantities sent from one level of the system to another level) from the lowest level available
- ✓ Account for multiple use products and complementary products and accessories
- ✓ Ensure that forecast takes into account system capacity – both service capacity and supply chain capacity
- ✓ Update forecasts regularly to keep up with rapidly changing service expansion and disease trends

## ***Procurement and Financing***

- ✓ Use appropriate procurement specialists/agents for implementation of public procurement processes.
- ✓ NAC should support the coordination and alignment of procurement and financing cycles to ensure a continued product supply.
- ✓ Procurement specialists should support the building of in-country procurement capacity
- ✓ Ensure that financing cycles and procurement cycles coincide so as to provide a continuous supply of drugs and consumables
- ✓ Coordinate with other donors to facilitate complementary procurement practices and to advocate for sustainable funding for HIV/AIDS commodities
- ✓ Simplify and streamline procurement procedures where possible
- ✓ Increase flexibility of procurement procedures to allow more frequent shipments and purchase of new technologies as they become available
- ✓ Budget an additional 15 to 20 percent of commodity costs to cover in-country logistics management costs

- ✓ Ensure that customs policies allow for the quick transfer of drugs from port to warehouse to facilitate their efficient distribution
- ✓ Communicate and coordinate with donors to ensure that any donated products meet country needs and policy guidelines

### ***Storage and Distribution***

- ✓ Consider hiring a consultant firm, NGO or individual consultant to assess and analyze storekeeping practices and develop storage system improvement strategies.
- ✓ Ensure the availability of storage space for commodities, including cold chain capacity. If applicable, consider “dejunking” storage facilities to free up storage space.
- ✓ Establish security measures to protect supplies from theft (standard national procedures, locks, guardians, etc.)
- ✓ Observe good storekeeping practices, utilizing First-to-Expire-First-Out (FEFO)
- ✓ Consider automating the inventory control system where possible.
- ✓ Adapt an agile inventory control systems for HIV/AIDS commodities that can easily changed to increased or decreased demand patterns and other systems constraints. This may mean piloting the use of PDAs or other wireless technology.
- ✓ Choose an ordering system based on the following considerations: number of products, transport system, reporting system, human capacity in logistics at the various levels of the system, supervisory systems and storage capacity.
- ✓ Properly plan and resource transport systems. Consider development of a scheduled delivery system and possibly outsourcing this function to the private sector.
- ✓ Asses and plan for capacity, fleet maintenance and usage of vehicle fleets.
- ✓ Optimize the supply chain system first, if the HIV/AIDS products are to be integrated as part other health commodity supply chains

### ***Logistics Management Information Systems***

- ✓ Planning for the LMIS should begin after the initial assessment of the system takes place
- ✓ Assemble an LMIS team of HMIS, LMIS, MAP M&E and MOH representatives to assess the current information system and develop improved systems.
- ✓ Ensure that LMIS systems which are systems for day to day management are not mixed with HMIS systems which serve a broader goal of strategic health planning.

- ✓ Consider hiring a consultant firm, NGO or individual consultant specializing in MIS, particularly if computerized systems are being considered
- ✓ LMIS should be in place before any products are distributed.
- ✓ LMIS should be kept as simple as possible, collecting at minimum the essential data for running the program.
- ✓ LMIS can be manual paper-based systems, automated systems or a combination of the two. The choice of system will depend on in-country system and human resource capacity, however, where possible opt to automate the system.
- ✓ Automate the system as it will help in managing data large number of products handled under an HIV/AIDS program.

### ***Quality Assurance***

- ✓ Enforce quality testing practices of all commodities entering the country
- ✓ Use a pre-qualified suppliers list when possible
- ✓ Ensure proper handling and storage of all commodities to avoid waste due to expiry, damage or exposure to the elements or pests.
- ✓ Minimize the number of products and brands
- ✓ Have a procedure in place to deal with product recall.

## Annex C: The MAP Project Cycle and HIV Logistics

### ***Poverty Reduction and Country Assistance Strategies***

- Supply chain management from forecasting to procurement to distribution to use is a key and critical function in delivery of services and needs to be addressed core function when developing country strategies and priorities. This means that the CAS and PRSP needs to include the commodity management plan for achieving the goals outlined.

### ***Identification Phase***

- A system assessment should be conducted as part of the identification phase or as part of the Country Procurement Assessment Report (CPAR) to determine strengths and weaknesses of the existing supply chain for all required health commodities.
- The assessment should inform product selection, forecasting, procurement and system strengthening efforts, whether to move products solely through the existing public sector system or to create a parallel system for HIV/AIDS commodities, or to utilize private or NGO supply chains, or a combination of the above.
- The assessment should also include both human and institutional capacity (both laboratory and health service delivery) to manage and scale up HIV/AIDS programs, particularly where programs expand beyond prevention and palliative care to include treatment interventions.
- The in-country experts with the WB need to review the outcome of the assessments, design potential supply chain system options and agree on a preliminary plan.

### ***Preparation Phase***

- During the preparation phase, commitments at policy-level should be established to address supply chain management as a critical element in achieving HIV/AIDS program success.
- Procurement plans for goods should include a logistics management plan that details the in-country management of commodities, including all elements of the Logistics Cycle.
- The development of the logistics management plan should be used as an opportunity to strengthen the health supply system as a whole, and take the focus beyond procurement to encompass the entire in-country supply chain.
- Product selection issues such as operational realities should be addressed during the preparation phase, prior to the forecasting exercise.
- National HIV/AIDS policies, standard treatment guidelines, standard

- testing protocols should be in place or under development.
- During this phase, countries should conduct a forecast for all commodities necessary to support the HIV/AIDS programs, based on a rational process using accepted forecasting methodologies and taking into account system capacity.
  - Outline the procurement process, all the players who may be involved, documenting the communications channels and roles and responsibilities.
  - In addition to the commodity costs, an additional 15 to 20 percent of the commodity costs should be added to overall loan/grant amounts to account for the costs associated with logistics management of the commodities.
  - NAC may decide to contract out responsibility for supply chain improvements and monitoring. If this option is included, the NAC should include funding for capacity building in contract management.
  - The logistics plan should also include a monitoring and evaluation plan.

### ***Appraisal Phase***

- Bank assessors should check for the existence of a logistics management plan and other considerations to support in-country management and distribution of health commodities

### ***Negotiation and Approval Phase***

- Both parties should discuss any Prerequisites/Conditionality are appropriate for supply chain management.

### ***Implementation and Supervision Phase***

- Countries and the National AIDS Councils (NACs) are responsible for implementation of the national plan for management of HIV/AIDS commodities and for monitoring supply chain functions and adapting them to changing circumstances.
- Bank staff need to supervision, assistance in maintaining flexible mechanisms for commodity management, ensuring sustainable financing.
- Implementation of the logistics management plan needs to be continuously reviewed to ensure that it is in line with the operational realities.

### ***Evaluation Phase***

- The evaluation should look at the core function of logistics and commodity management and determine whether this bottleneck was controlled and successfully managed. A critical indicator that the evaluation should include is the availability of commodities at the lowest level of service delivery.



REQUISITION AND ISSUE VOUCHER							
Requisition No: _____							
Health Facility: _____							
Authorized By: _____							
Date: _____							
Requisitioned by:					Issued by:		
Stock No.	Description	Unit of Issue	Stock on Hand	Quantity Requested	Quantity Approved	Quantity Issued	Remarks
Requested by:					Date:		
Approved by:					Date:		
Shipped by:					Date:		
Received by:					Date:		





## Annex E: Illustrative List of Products for Opportunistic infections

Respiratory diseases	
ARI fungal infection	amphotericin B inj.
HIV-ARI histoplasmosis & coccidiomycosis	amphotericin B inj.
ARI severe bacterial pneumonia	ampicillin inj. & oral
ARI severe bacterial pneumonia	cloxacillin inj.
HIV-pneumocystis carinii	dapsone oral
HIV-ARI coccidiomycosis	fluconazole oral & inj. as an alternative to amphotericin B
super imposed pneumonia in PTB patients (staph. aureus)	flucoxacillin
ARI severe bacterial pneumonia	gentamicin inj.
ARI histoplasmosis	itraconazole oral.
HIV-ARI aspergillosis	itraconazole oral. as an alternative to amphotericin B
ARI fungal infection	ketoconazole oral
HIV-pneumocystis carinii	pentamidine oral
ARI	phenoxymethylpenicillin oral
HIV-pneumocystis carinii	primaquine oral
HIV-pneumocystis carinii	sulfadoxine + pyrimethamine oral

Herpes	
HIV-herpes zoster	aciclovir oral & inj.
HIV-extensive herpes simplex	aciclovir oral & inj.
HIV-extensive herpes simplex	foscarnet (alternative to aciclovir)
HIV simplex mouth ulcers	methylrosanilinium chloride local application

Fever	
fever (presumed sepsis or meningitis)	chloramphenicol
fever (presumed sepsis or meningitis)	ampicillin as an alternative to chloramphenicol
fever (occult non serious bacterial infection)	sulfamethoxazole + trimethoprim

Gastrointestinal tract/diarrhoeal disease	
HIV-GIT- microsporidiosis	albendazole oral
HIV-diarrhoea-amoebiasis/ giardiasis	albendazole oral
HIV-diarrhoea-salmonellosis (non-typhoid, extra-intestinal)	ampicillin
HIV-diarrhoea-escherichia coli (enterotoxigenic and entero pathogenic)	ampicillin as an alternative to TMP-SMX
HIV-GIT- Shigella sp, Salmonella sp	ciprofloxacin oral
HIV-GIT- Shigella sp, Salmonella sp	chloramphenicol oral
HIV-diarrhoea	diloxanide oral
HIV-GIT- Campylobacter sp	erythromycin oral
HIV-diarrhoea-CMV	ganciclovir
HIV-diarrhoea-yersinia enterocolitica	gentamicin
HIV-diarrhoea-helminthic infection	mebendazole oral
HIV-diarrhoea-giardia lambia, entamoeba histolytica, microsporidia	metronidazole oral
HIV-diarrhoea-escherichia coli (enterotoxigenic and entero pathogenic)	nalidixic acid as an alternative to TMP-SMX
HIV-diarrhoea shigella	nalidixic acid
HIV-diarrhoea-candida albicans	nystatin oral

<b>Neurological disorders</b>	
meningitis (empirical treatment)	benzylpenicillin inj. + chloramphenicol inj.
meningitis cryptococcus	amphotericin B inj.
meningitis Haemophilus influenzae	ampicillin
bacterial meningitis (Haemophilus influenzae, pneumococcus)	chloramphenicol oral & inj.
meningitis Streptococcus pneumoniae, Neisseria meningitis	benzylpenicillin inj.
HIV-toxoplasmosis	clindamycin inj. & oral
HIV-toxoplasmosis	sulfadiazine oral
HIV-toxoplasmosis prophylaxis	dapsone + pyrimethamine

<b>Kaposi's sarcoma</b>	
HIV-Kaposi's sarcoma	adriamycine inj.
HIV-Kaposi's sarcoma	bleomycin inj.
HIV-Kaposi's sarcoma	doxorubicin inj.
HIV-Kaposi's sarcoma	etoposide oral
HIV-Kaposi's sarcoma	methotrexate oral
HIV-Kaposi's sarcoma	vinblastine inj.
HIV-Kaposi's sarcoma	vincristine inj.

<b>Candidiasis</b>	
mucocutaneous infection	amphotericin B loz. & susp.
candida oesophagitis	amphotericin B inj.
mucocutaneous infection	clotrimazole 1 % cream
candida oesophagitis	fluconazole oral
mucocutaneous infection	methylrosanilinium chloride local application
candidiasis	nystatin oral

<b>Drugs for palliative care</b>	
promethazine suspension & inj.	allergy, anxiety, itching (treatment with antihistaminics)
chlorpheniramine oral & inj.	allergy, anxiety, itching (treatment with antihistaminics)
diazepam oral & inj.	anxiety, convulsions
amitryptiline oral	depression
loperamide oral	diarrhoea
diphenoxylate oral	diarrhoea
carbamazepine	epilepsy, convulsion
atropine	hypersecretion
calamine local application	itching skin rash
hydrocortisone local application	itching skin rash
meclopramide	nausea
codeine oral	pain, cough, diarrhoea
haloperidol	severe anxiety, psychosis, intractable hiccups
chlorpromazine	severe anxiety, psychosis, intractable hiccups
pethidine oral & inj	severe pain
morphine oral & inj	severe pain

<b>Cytomegalovirus</b>	
HIV-cytomegalovirus	ganciclovir inj (treatment or prophylaxis)
HIV-cytomegalovirus	ganciclovir oral (maintenance)
HIV-cytomegalovirus	cidofovir IV (alternative to ganciclovir, prophylaxis)
HIV-cytomegalovirus	foscarnet inj. as an alternative to ganciclovir

## ANNEX F: Selection of HIV Test Kits for VCT AND PMTCT Services

Below are some of the operational considerations that must be taken into account in HIV test kit selection for voluntary counseling and testing and PMTCT services:

### **Country Example** **Inflexible contract mechanisms may lead to waste**

In one country, a large donor-supported project to expand the HIV/AIDS program is underway. But the contract for HIV test kits is fixed for three years, and it specified a test kit that has a shelf-life of only six months at manufacture. By the time the product arrives in country, it will have only three or four months of shelf-life remaining. The length of the in-country pipeline in most public sector programs is measured in years, not months. It will be very difficult in this situation to ensure continuous availability of HIV testing, and it's likely that many of these kits will expire.

More flexible contracting mechanisms, such as framework contracts or short-term contracts may help to avoid situations like this one.

### ***Essential Characteristics***

- At a minimum, the test kits that are being considered for selection must have two essential characteristics:
- All tests being considered come from pre-qualified suppliers, and are either registered in the country or can be registered easily with minimal delays
- For all tests under consideration, data are available on sensitivity and specificity

### ***User-Friendliness and Practicality***

- How many steps are there between collecting the blood sample and reading the results?
- Are multiple steps required to prepare the sample (centrifugation) or the reagent?
- Is the test result easy to read and interpret? Is there a degree of subjectivity in reading the test results that might lead to false positive (or negative) result?

### ***Rapidity of Test Results***

- The total time required to conduct the test and obtain results is critical when considering program planning and expansion. For example, particle agglutination devices take 10-60 minutes to provide test results, while flow-through and lateral-flow devices can provide results within 5-15 minutes.

### ***Storage Conditions for Test Kits***

- Do the tests or reagents require cold storage or refrigeration?
- Given the conditions at most lower-level health facilities, can the tests or reagents be stored between 8-30°C?
- Would any other special storage requirements affect storage capacity at lower level health facilities, such as photosensitivity or bulk consumable and equipment requirements?

### ***Shelf Life of Test Kits***

- What is the shelf life at the recommended storage conditions? Is it 12 months or more? Or six months or less?
- Keep in mind that, in general, the majority of test kits (unless they are locally manufactured) will arrive in a country with at least three months less than their total shelf life remaining. For example, a product with a 12-month shelf life will have 8-9 months left on arrival in any given country.
- When considering shelf life, match the remaining shelf life (total shelf life minus three months) with the length of the in-country pipeline.
- If the test requires chase buffer or other reagents, do these have different shelf lives than the testing device?

### ***Equipment and Consumable Requirements***

- What additional equipment is required to perform the assay?
- Is use of the equipment limited to certain cadres of staff, e.g., lab technicians?
- How many consumable items are not provided in or with the kit but are necessary to perform the test?
- What is the average cost of these items and will they add significantly to the cost of the test kits?
- Are the items bulky to store and transport?

### ***Packaging of Tests Per Kit***

- Is the kit designed for high-volume or low-volume testing sites?
- Is there flexibility in specifying the number of tests per kit and the volume of chase buffer or other reagents?
- Are the tests individually packaged within the kit? For example, if the kit is being considered as a tie-breaker, for which demand is relatively low, can the tests from one kit be distributed to several sites?

### ***Cost of Tests***

- What is the price range for the test kits?
- What is included in the price, i.e., how many tests, what consumables, etc.?
- Are there any “hidden” or associated costs, such as for equipment or reagents; complex training requirements for staff; or storage and distribution costs?
- Is the quoted price competitive regionally and internationally?

Source: JSI/DELIVER. (2003) HIV Test Kit Selection: Operational Considerations for VCT and PMTCT Services



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