REPUBLIC OF RWANDA

MINISTRY OF HEALTH

Health Supply Chain Management Module for RMS branches and Central level

March 2021

Foreword

Strong public health supply chains require trained and skilled staffs who are both familiar with the standard operating procedures required for each logistics function and are also empowered to participate in decision and policy-making processes related to health supplies and supply chains. A lack of trained staff with the right skills is a frequent cause of supply chain system breakdown and poor performance, ill-functioning product management, and, ultimately, product stockouts and expiries. This is compounded by a lack of recognition among many health institutions of the vital role supply chain personnel play in the performance of health systems.

In all public institutions, current supply chain workers are recruited based on being a pharmacist or nurse. Many nurses and pharmacists are asked, at some points in their career, to fulfill supply chain tasks. Job descriptions for supply chain cadres are not widely available, and those that do exist are not standardized, although the Ministry of Health (MOH) has supply chain job descriptions at the central level (procurement, quantification, warehousing, distribution, etc.).

Lack of the competency models for supply chain results in: 1) inability to conduct workforce planning efficiently, poor performance management, inefficient training, lack of career path on supply chain and 2) inability to strategically allocate appropriate funds to supply chain human resources.

Trainings of some store managers, pharmacists, and lab technologists have been carried out with the support of MOH and other stakeholders over many years now. Development partners also support the pre- and in-service training of supply chain managers at the national, district, and health facility level. However, there are no standardized materials or training manual for such in service training which tends compromise the quality of training provided to supply chain staff at district and central levels.

The Ministry of Health is pleased to introduce the first training manual intended to be used for in-service training of the supply chain cadres working at both RMS branches and central level. This training manual will also be used for self-learning and on job training purposes. The manual will serve as a standard tool that can be used not only to build capacity but as a one of the sources for identifying examples of supply chain management best practices.

I would like to urge all stakeholders from government institutions to use this manual for the purpose intended for. I also appreciate the pharmaceutical sector development partners for their continued support to Rwanda's health development.

Dr. NGAMIJE M. Daniel
Minister of Health

Acronyms

MOH	Ministry of Health
SDPs	Service Delivery Point
NBTC	National Blood Transfusion Centre
ACT	Artemisinin combination therapy
AMC	Average Monthly Consumption
BCG	Bacillus Calmette-Guerin
BUFMAR	Bureau des Formations Médicales Agréées du Rwanda
CHW	Community health worker
COSA	Comité de Santé
DH	District hospital
DHMT	District Health Management Team
DP	RMS District Branch
DTC	Drug and Therapeutic Committee
EML	Essential medicines list
EOP	Emergency order point
FEFO	First to expire first out
FIFO	First in first out
HC	Health Centre
JSI	John Snow Inc.
LMIS	Logistics Management Information System LT Lead Time
M&E	Monitoring and Evaluation
MoS	Months of stock
RMS Ltd	Rwanda Medical Supply Ltd
MSH	Management Science for Health
NGO	Non-Governmental Organization
NML	National Medicine List
NMP	National Medicine Policy
NRL	National Reference Laboratory
OP	Ordering period
POD	Proof of delivery
PVC	Polyvinyl chloride
QMIA	Quality management improvement approach
RBC	Rwanda Biomedical Center
RBTC	Reginal Blood Transfusion Center
RDTs	Rapid Diagnostic Tests
RPPA	Rwanda Public Procurement Authority
SO	Stock on order
SOH	Stock on hand
SOP	Standard operating procedure
SS	Security stock
SS	Safety stock
STG	Standard treatment guidelines
UNDP	United Nations Development Programme
GHSC- PSM	United States Agency for International Development Global Health Supply Chain- Procurement and Supply Management
VEN	Vital, Essential and Non-essential
WHO	World Health Organization
RCE-V IHSCM	Regional Centre of Excellence for Vaccines, Immunization and Health Supply Chain Management

Background

In 2006, WHO identified health workforce performance as one of the six building blocks essential to strengthening health systems. An essential component of a robust health system is an effective supply chain which provides health workers and clients vital public health commodities. An effective supply chain, in turn, involves engaging the right people in the right quantities with the right skills in the right place at the right time to implement the procedures that direct supply chain operations and ensure the supply of health commodities.

Strong public health supply chains require trained, skilled staff who are both familiar with the standard operating procedures required for each logistics function and are also empowered to participate in decision and policy-making processes related to health supplies and supply chains. A lack of trained staff with the right skills is a frequent cause of supply chain system breakdown and poor performance, ill-functioning product management, and, ultimately, product stock outs. This is compounded by a lack of recognition among many health institutions of the vital role supply chain personnel play in the performance of health systems.

The training manual on supply chain management was developed to assist district and central levels health supply chain staff to plan and conduct their day-to-day roles and responsibilities. Many of the techniques described in this training manual are helpful to users to ensure they are performing their duties well. Additionally, some of the information may be helpful to new recruited staff who do not have robust logistics management knowledge. This training manual may also serve as a checklist of systems and procedures that need to be in place to manage health products well.

Sometimes, in -country management of health products receives little attention which could result in poor delivery of health products to facilities that need them. The manual focuses on the in-country management of health products and should be used as a complement to other documents developed to address the management of medicines and related supplies.

This training manual explains the basic of logistics and supply chain management for health products. It seeks to provide practical guidelines for district and central level staff involved in the management of health product. For more information on logistics and health supply management, users have been provided with further links in the reference section.

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Unit 1: Introduction to Heath Supply Chain and Logistics Management

Objectives

By the end of this chapter, users will be able to:

- Define supply chain and logistics management related terms
- Describe the logistics cycle and components
- Briefly describe Rwanda's health supply chain system

1.1. Introduction

1.1.1. Supply Chain and Logistics Management

1. **Supply chain** refers to flow of products, services, resources, and information that ultimately fulfill customer's request.

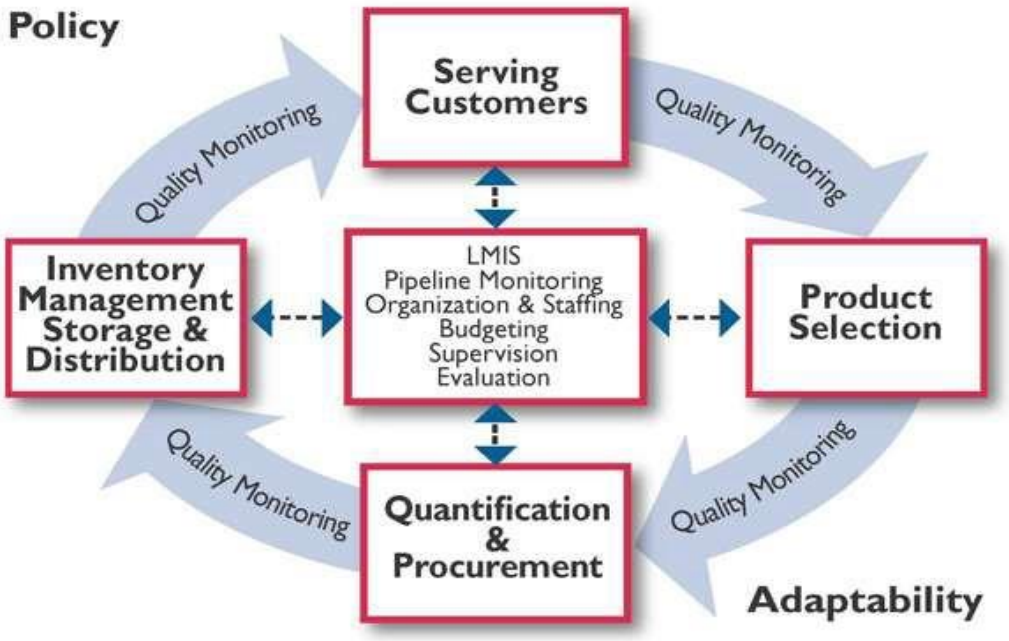
2. **Supply chain management** is the process of managing and coordinating flows of goods, services, information, and resources from the source to end-users.

3. **Logistics management** refers to management of what happens within an organization while purchasing and delivering materials from suppliers to end-users.

1.1.2. Supply Chain Cycle

A Supply chain cycle shows how the different components of health supply chain systems are interdependent.

The Supply Chain Management Cycle



1.1.3. Major Components of the Logistics cycle

- **Product Selection**

  This is the process of determining list of health products needed by certain health setting and done based on the essential medicines list (EML) and standard treatment guidelines.

- **Quantification**

  Quantification is the process of estimating quantities and costs of health products in the future and determining when they should be delivered to ensure an uninterrupted supply.

- **Procurement**

  Procurement is a critical function within the supply chain that ensures health products are purchased and made available to customers as planned.

- **Inventory Management**

  Inventory management is the practice of tracking and controlling orders, their usage and storage, it should apply the principle of maximum and minimum levels to avoid overstock or under stock. Storage and distribution are part of inventory needed to ensure product reach the end-users without their quality being compromised.

- **Serving customers**

  The logistics system is designed to optimize customer service. Each person who works in logistics should know that he or she selects, quantify, procures selects, procures, stores, or distributes products to meet customer needs.

- **Logistics management information system (LMIS)**

  A logistics management information system (LMIS) is a system of records and reports whether paper-based or electronic, used to aggregate, analyze, validate, and display data from all levels of the logistics system. This is at the heart of logistics cycle.

- **Other activities at the heart of the logistics cycle**

  Other activities that help to drive or support the logistics cycle include organization and staffing/supply chain workforce, budget/financing, supervision, and monitoring and evaluation/performance management and risk management.

- **Policy and Legislation**

  These are government laws, regulations and guidelines, which affect all elements of a logistics system.

- **Adaptability**

  The adaptability of the logistics system is the ability to obtain resources needed to address increase in demand. It may also mean ability and flexibility to respond in a positive way to changes in policy and legislation.

- **Quality monitoring**

  It is important to understand the role of quality monitoring in ensuring an efficient and effective logistics system. Quality monitoring refers not only to the quality of the product, but also to the quality of service and the quality assurance built into processes and procedures in the system, also aimed to improve quality.

Quality monitoring appears four times in the logistics cycle:

1. Between product selection and quantification and procurement to emphasize why quality monitoring is important role in selection quantifying and procuring the right products.
2. Between quantification and procurement and inventory management to ensure quality of health commodities during distribution and at the time of receipt.
3. Between inventory management and serving customers to ensure quality is maintained during storage and when patient receive them for use.
4. Between serving customers and product selection to determine if customers are satisfied with quality of both products and service they received.

1.2. The importance of effective logistics/supply chain system

- Effective supply chain enhances quality of care by providing adequate, appropriate supplies to health providers, and increasing professional satisfaction to deliver a higher quality of service.
- Effective supply chain improves cost efficiency and effectiveness by reducing losses due to overstock, expiry, damage and pilferage.
- Effective supply chain reduces the cost of lost treatment, if there are no products, patients are not treated and may die. This a loss to the community.

An effective supply chain system includes the following components:

- **Warehouses** from central, intermediary and other storage facilities where health commodities are held until given to another facility or patients.
- **Transportation** assets from large trucks to smaller trucks that move products from the warehouses to health facilities.
- **Service delivery point** where customers receive the products that they need. These include hospitals, health centers and health posts. Patients may also receive products in the community from community health worker.

1.3. Supply Chain Integration

Countries achieve an integrated public health supply chain through three sequential phases:

1. Ad hoc phase is when stakeholders have little common understanding about the supply chain and have no formal procedures for its operation, leading to fragmented supply chain system efforts
2. Organized phase is when a supply chain system, including LMIS, are designed and implemented based on clear basic logistics functions roles and procedures, and sufficient financial and human resources are mobilized to operate the system.
3. Integrated phase is when people, functions, levels, and entities of the supply chain are linked and managed under an interconnected supply chain organization.

Moving from Ad Hoc to Organized

- Assess as-is system using process mapping, network optimization, and costing analysis
- Undertake technology assessments to improve information for decision making
- Employ system design process for all logistics functions and products using segmentation analysis
- Roll out system, including logistics training and dissemination of job descriptions, standard operating procedures, and supervision guidelines
- Perform regular quantification of commodities.

Moving from Organized to Integrated

- Create a logistics management unit and establish central level technical groups and committees
- Professionalize supply chain managers
- Optimize performance with analysis and design tools Introduce flexible procurement processes
- Diversify financing schedules and sources
- Strengthen automated processes for data aggregation, analysis, and sharing
- Generate and publish routine logistics reports
- Develop performance management plans with indicators and incentives.

1.3.1. Characteristics of an Integrated Supply Chain System

- **Clarity of roles and responsibilities:** roles, responsibilities, and processes (such as reporting or resupply procedures) are established and made known throughout the supply chain.
- **Agility:** logistics functions are performed quickly, accurately, and effectively so products, information, and decisions can move swiftly through the supply chain to respond promptly to customer needs.
- **Streamlined processes:** bureaucratic issues and processes that interrupt the flow of information and commodities are eliminated.
- **Visibility of information:** data are visible throughout the supply chain, usually through computerization, so different levels can see where products are and what the demand is and use this information to better meet customers' needs.
- **Trust and collaboration:** a collaborative environment exist that can help break down existing functional and organizational barriers to improve supply chain performance.
- **Alignment of objectives:** organizations and levels have a compatible vision, goals, and objectives to ensure consistency in direction within the supply chain.

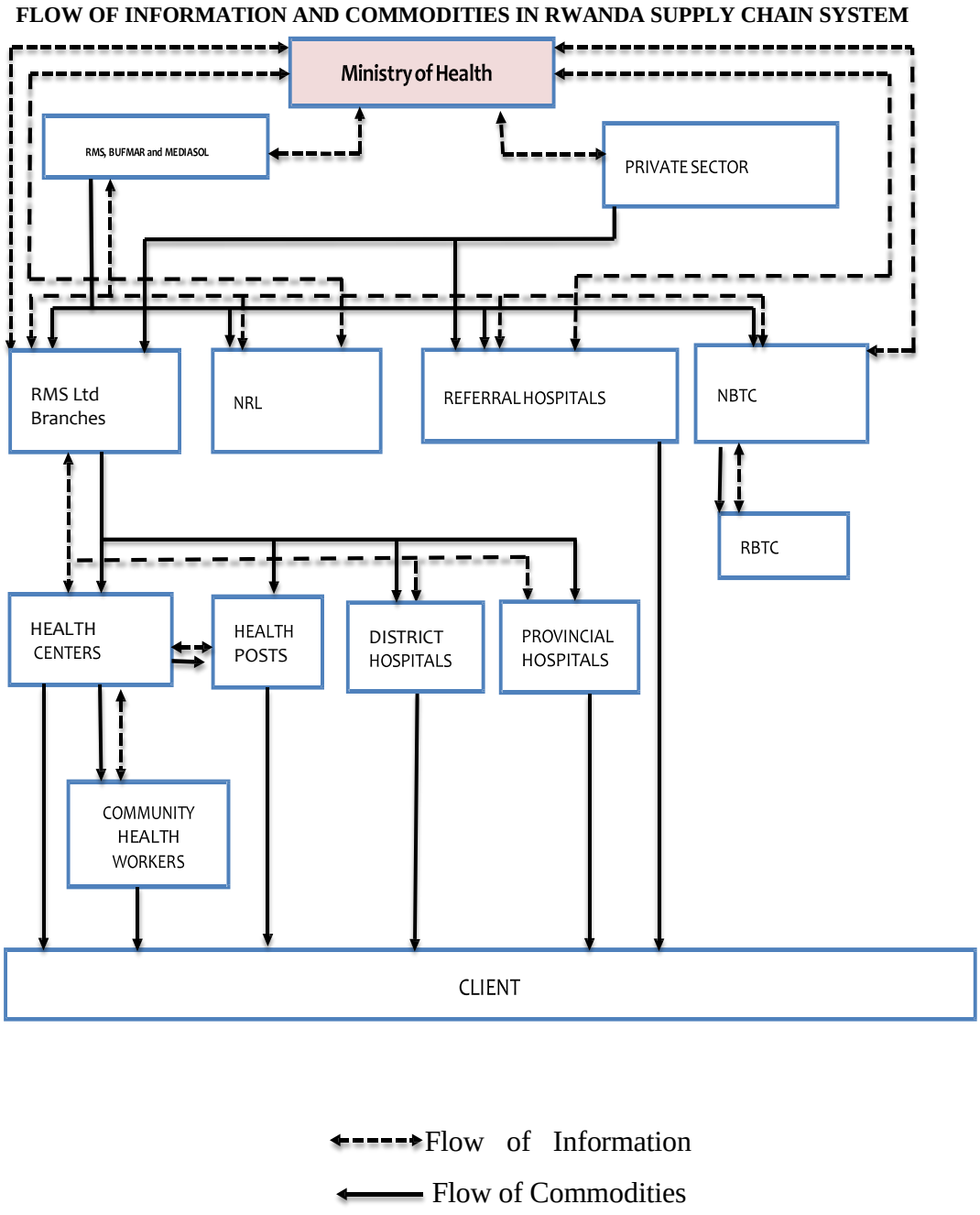
1.3.2. Rwanda health supply chain system

The Rwanda health supply chain system is an `integrated system whereby MOH coordinates the supply of medical products and technologies through the Rwanda Medical Supply Ltd (RMS Ltd); Bureau des Formations Médicales Agréées du Rwanda (BUFMAR) and private pharmaceutical wholesalers which procure and distribute products to Public and private pharmacies and health facilities.

At RMS Ltd Branches, medical products and technologies are stored and distributed to health facilities (district hospitals, health centers, health posts etc.). Health Centers distribute medical products and technologies to community health workers. All health facilities and community health workers serve the end users/clients. The health supply chain information flow in reverse direction from community health to health centers, to district hospitals report to RMS branches. After aggregation of information, all RMS branches report to the national level. More details are embedded in the other chapters.

NB: See below diagram

Diagram 1: Flow of Health products and Information



Introduction to Health Supply Chain management online resources

All online resources are free, and you will need to create an account as some of the links requires to access training. For the UNDP link, register with a non-UNDP email address

https://www.undp-psmtraining.com/login/index.php https://www.undp-psmtraining.com/course/view.php?id=2&section=1	
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Unit 2: Health Product/Technologies Selection and Quantification

Objectives

By the end of this chapter, users will be able to:

- Explain the role of the national medicine policy in product selection
- Describe pharmaceutical legislation and regulation
- Describe the differences between pharmaceutical laws, regulations and guidelines
- Describe the importance of laws and regulations
- Describe health product selection process
- Explain the purpose of selection.
- Describe the purpose of quantification
- Apply quantification methods

2.1. Introduction

Health product selection is the process of determining list of health products needed by certain health setting. To achieve this, the national medicine policy/legislations/laws, standard treatment guidelines, and essential medicines list should be used.

2.1.1. National medicine policy/Pharmaceutical legislation and regulation

All countries have a national medicine policy (NMP) which outlines country goals to consider when selecting and procuring medicines. The same policy also explains roles and responsibilities of the parties involved in the supply of medicines as well as those who use medicines at the service delivery level. It is very important that any organization involved in supply and distribution of medicines should abide by this policy and must keep a copy for reference.

The aims of using national medicines policy are:

- To make and maintain the laws (legislation) and rules (regulations) to ensure availability and accessibility of adequate essential medical products and technologies
- To select essential medicines to be used in the country
- To provide guidance for medical product and technologies supplies financing
- To ensure the medical products and technologies supply system works well

2.1.2. Pharmaceutical laws and regulation

These documents are used alongside the national medicine policy to guide the process of product selection.

2.1.3. What are the differences between pharmaceutical laws, regulations and guidelines?

- **Laws** are based on by the government to issue regulations and passing laws require a lengthy process.
- **Regulations** can pass or altered more rapidly and simply than laws and has same powers as laws when approved.
- **Guidelines** can be more easily modified and updated and usually offer informal information on what the government's thinking is, regarding the best way to implement laws and regulations.

2.1.4. Why pharmaceutical laws and regulations are important?

- To prevent the use of ineffective, poor-quality, or harmful medicines that can result in therapeutic failure, exacerbation of disease, resistance to medicines, and sometimes lead to death.
- To ensure confidence in health systems, health professionals, pharmaceutical manufacturers, and distributors are not undermined.
- To protect public health, governments need to approve comprehensive laws and regulations and to establish effective national regulatory authorities to ensure that medicines are regulated properly.

2.1.5. Standard treatment guidelines

A standard treatment guideline document aims to guide decisions and criteria regarding diagnosis, management, and treatment of diseases. Standard treatment guidelines show the best way to treat a disease in the country. A committee of health professionals (physicians, nurses, and pharmacists) with the best understanding of what happens in your country is responsible for developing these guidelines.

After being approved by MOH, standard treatment guidelines are often printed as small booklets and disseminated to all health care providers and facilities.

2.1.6. Essential medicines list

The EML is a set of medicines that satisfy the priority health care needs of the population; they should therefore be available always in adequate amounts and in appropriate dosage forms, at a price the community can afford.

An EML helps not only to ensure procurement of the medicines that are both efficacious and cost-effective, but also helps to determine which category of health facility levels are appropriate for these medicines.

2.2. Selection criteria

Recommended treatments and drugs selected depend on many factors, such as use of generic names, the pattern of prevalent diseases, treatment facilities, the training and experience of available personnel, financial resources, and genetic, demographic, and environmental factors. Other reasons may apply such as in certain rare instances, selection may be based on prescriber's preference for brand products instead of generic products. This is however to be discouraged.

2.2.1. Why use of generic names is more preferred than brand names?

- Generic names are more informative than brand names and facilitate the purchase of products from multiple suppliers.
- Generic products are often less expensive and affordable than brand products.
- Generic prescribing facilitates product substitution whenever appropriate.

2.2.2. The purpose of product selection

- Enables development and implementation of a coordinated logistics system
- Facilitates access to more affordable commodity price
- Identifies the products from the essential medicine list that should be quantified, as funding may be limited. This makes the procurement process easier

2.2.3. Roles and responsibilities in product selection

RMS branch and central level representatives are involved in national product selection exercise. Other representatives include members of the Drug Therapeutic Committee (DTC) at other levels and can contribute to the revision of the EML as described in the DTC's terms of reference.

2.3. Quantification

2.3.1. Introduction:

Quantification considers the expected demand for commodities, unit costs, existing stocks, stock already on order, expiries, lead time, buffer stocks and shipping costs. All this information helps quantification committee to calculate estimates of both total commodity requirements and costs for the program. These two are then compared with the available mobilized funds to determine final quantities to procure.

2.3.2. Quantification and related terms

• **Quantification** is the process of estimating the quantities and costs of the products required for a specific health program and determining when the products should be delivered to ensure an uninterrupted supply for the program. Quantification is a combination of forecasting and supply planning.

• **Forecasting** is the process of making future predictions by basing on the past and present data most commonly by analyzing the trends.

• **Supply planning** is the process of detailing the quantities required to fill the supply pipeline, costs, orders, and arrival dates of shipments-this is the final output of the quantification.

• **Supplies, commodities, goods, products, and stock** are all the items that flow through the supply chain system.

• **Users, clients, patients, and customers** are people who receive supplies to use.

• **Pipeline** is the entire chain of storage facilities and transport links through which supplies move from the manufacturer to the consumer. Links including port facilities, central warehouse, regional warehouses, district warehouses, all clinics, hospitals, and transport vehicles.

• **Push System** is a system in which staff at the next higher level decide how much stock to send to the next lower level. The decision is made at the higher level and is based on data in reports from the lower level. This is based on lower-level usage rate and remaining stock on hand.

• **Pull System** is a system where the staff at the lower level decide how much stock they want to order. This is also based on their usage rates and remaining stock on hand.

• **Lead-Time** is the time between placement of an order for supplies and receipt of the supplies **at** the medical store and thereafter available for use.

• **Ordering period** is how often an order is placed in a system, and this varies across all levels.

• **Dispensing/consumption data** is the quantity of items dispensed to clients or patients and it is usually measured in units consumed within a specific period.

• **Issues data is** information of supplies shipped from one level of a system to another, and it can be used to predict use in case dispensing data are not available.

• **Demographic data** is information on numbers and characteristics of the population that will desire, require or be offered a service for which commodities are required (these are not products that are required to treat a health condition or disease).

• **Morbidity data** is information on prevalence and incidence of a disease or health condition in a given population.

• **Procurement data is** information on amounts of products procured in the recent past by the national government, NGOs, or amounts planned for upcoming procurement.

• **Service data** is information on number of visits, number of services provided, or number of cases treated over a specified period.

• **Stock on order** is stock ordered during the procurement period but have not yet received

• **Stock on hand** is stock available at the health facility for dispensing or warehouse for distribution, including safety stock. It is also called working stock

• **Buffer/Safety stock is** minimum stock kept on hand to protect against stock-outs.

• **Losses and adjustments** are stock removed from the pipeline for any reason other than consumption by clients (such as expiration, theft, damage, and so on).

• **Adjusted monthly consumption** is a quantity of stock consumed for one month after adjustment for unusual situations such stockout.

• **Average monthly consumption is** the number of units that a facility is likely to use in a month.

• **Security stock** is stock kept on hand to protect against stockouts caused by delayed delivery or increased demand. This is also called safety stock

• **Ordering interval/review period** is the period after which stock should be ordered, and review period is the time between two routine orders.

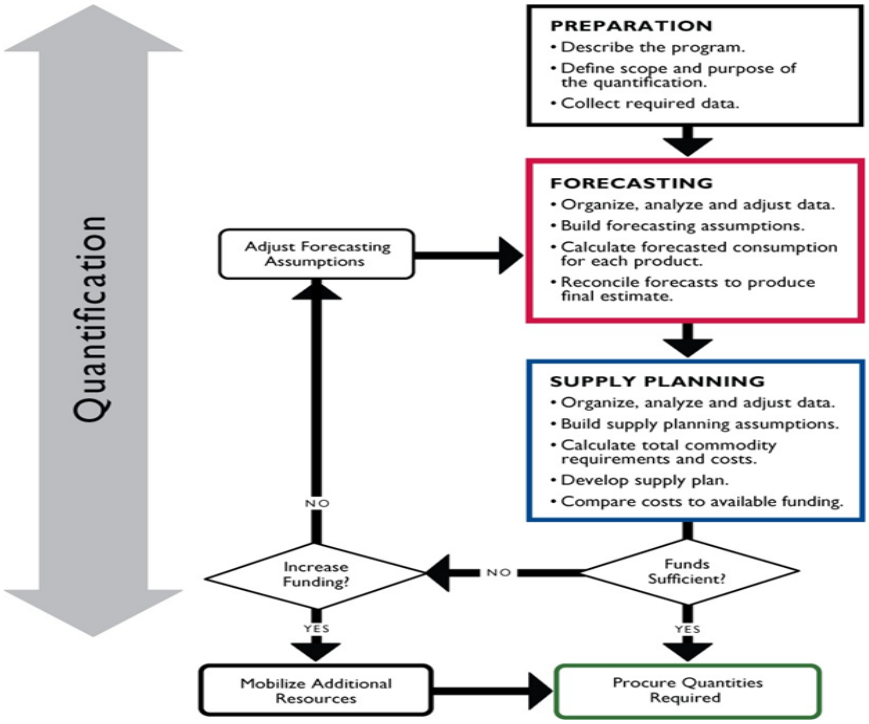
2.4. The purpose of quantification

2.4.1. Quantification is done to ensure:

- Accuracy in forecasting, supply planning, procurement planning, and budgeting.
- Mobilization and allocation of funds for commodity procurement.
- Advocacy for funds to identified and concerned stakeholders to fill commodity gap/need.
- Coordination of multiple sources of funding for procurement.
- Identification of areas for advocacy such as strengthening data collection, reporting system, inventory management procedures and funding.

2.4.2. Key steps and processes in quantification

Diagram 2: Key steps and processes in quantification



1. **Preparation:** This involves assembling a quantification team, assessing the program, describing the program performance as well as strategic plans, defining the purpose and scope of the quantification exercise, and collecting required data.
2. **Forecasting:** This involves organizing, analyzing, and adjusting data to obtain consensus on the forecasting assumptions while calculating future consumption for each product, as well as comparing and reconciling results of different forecasts.
3. **Supply planning:** This involves organizing data for analysis, building supply planning assumptions, estimating total commodity requirements, developing a supply plan, and comparing costs to available funding.

NB: Before any quantification exercise is done, planning is very important to ensure its success. This includes all the preparatory steps such as assessing the program, defining the scope and coverage of the quantification including the target population, and compiling the list of products to be quantified.

2.4.3. Five steps of Planning

Five steps of Planning include describing the program, defining the scope, defining the target population, compiling a list of medicines to be procured based on standard treatment guideline, and determine the sources of available data. Planning also includes preparing a preliminary written schedule for the quantification process, which includes travel schedules, appointments with key officials, and preparation of the quantification exercise.

1. **Preparation process**

During preparation for the quantification exercise, team members begin to collect program background information and data from as many sources as possible.

Four steps of preparation process:

Step 1: Assemble a quantification team
Most quantification teams have 6-15 members such as program managers, a procurement specialist, an M&E officer or other information specialists, warehouse managers, service providers, donor agencies, implementing partners, and technical experts in quantification.

Step 2: Describe the program performance, policies, and strategic plans

Step 3: Define the purpose and scope of the quantification exercise, e.g. timing and products. For example. The purpose of the quantification is to estimate the commodity needs and costs to support diagnostic testing and treatment for the national malaria program fo5r 2015-2019.

Step 4: Collect required data (for forecasting and supply planning)
A data capturing template is usually developed with a checklist of all data to be collected. This will make sure all data are available before the exercise begin. It also presents the gap in data for stakeholders to deliberate on while making feasible assumption around generated data gaps.

2. Forecasting process

Forecasting, the second step in the quantification process, uses the data collected during the preparation step to estimate the quantity of each product that will be dispensed or used during each year of the quantification.

Four steps of the forecasting process:

Step 1: Organize, analyze, and adjust data
After collecting the available data, you need to assess its quality before estimating the data to be reported. This means one should adjust for incomplete or unreliable consumption, service and demographic data. For example, if the program experienced a stockout, adjust the reported consumption data to account for that. Some types of data require conversions.

Step 2: Build and obtain consensus on the forecasting assumptions
In many cases, data are incomplete, outdated, unreliable, or unavailable. Therefore, to develop the forecast, it will be necessary to make some assumptions about program performances, targets, and future demand.

Step 3: Calculate the forecasted consumption for each product
Regardless of the data the quantification team uses for the exercise, the team must document the sources of the historical data, actual data collected, data quality issues, and any data adjustments. For each product, estimate the future consumption, the future type and number of services that will be provided, or the average absolute number of increase or decrease from one reporting period to the next.

Step 4: Compare and reconcile results of different forecasts

If availability and quality of data permits, the quantification team can use different types of data to conduct multiple forecasts. The forecasting steps must be repeated for each of these data types. Use at least two types of data and prepare separate forecasts, if possible. Compare the final forecast consumption quantities from each forecast and consider the implications of the different forecast for the program, including service capacity, storage and distribution capacity, funding availability, and other issues that could affect demand, supply, and use of commodities, past and current reports on expiration.

3. Supply planning process

To be successful, public health programs must always have enough medicines and supplies to meet the needs of their clients. At the same time, programs must avoid surpluses that waste products and money. Supply planning is used to estimate the total commodity requirements and costs for the program within a specific period. To calculate this estimate, start with the forecasted consumption for each product. Consider the stock on hand, any quantities of product already on order but not yet received, and the established maximum and minimum stock level. Be sure to include procurement and supplier lead times and provide a buffer stock for unexpected delays. Pipeline, a desktop software tool, has helped program managers in many countries to plan optimal procurement and delivery schedules for health commodities, and it monitors procurement orders throughout the supply chain.

Supply Planning Process Steps

Step 1: Organize and analyze data

Data for the supply planning step are different from the data for the forecasting step. However, it is important to collect both data types at the same time. Examples of data required for supply planning include stock on hand in the program, in-coming shipments, expiration dates and suppliers/vendors etc.

Step 2: Build supply planning assumption

As with the forecasting step, make assumptions in the supply planning step to account for missing, or low-quality data. However, the data user will then need to build consensus around the assumptions. Remember, it is important to document clearly and specifically the sources of information and the key informant inputs on the assumptions.

Step 3: Estimate total commodity requirements and costs

To estimate the total commodity requirements, you must determine the quantity of each product needed to meet the forecasted consumption and ensure the in-country supply pipeline has adequate stock levels to maintain a continuous supply to service delivery points.

Step 4: Develop the supply plan

Developing a supply plan, including the shipment quantities and delivery schedules, will ensure a continuous supply of products to the country. Developing the supply plan helps program managers to enter and track forecasting consumption data, identify funders and funding commitments for each product, identify suppliers for each product, coordinate timing of funding commitments and procurements, and schedule shipments according to procurement lead times.

2.5. Quantification methods

2.5.1. There are two common methods of quantification:

Consumption method: past consumption records of individual medicines are used to project future needs. It is essential to adjust for stockouts, projected changes in utilization (program scale up), and losses (pilferage, wastage, damage). In other words, the consumption method estimates the quantity of products expected to be consumed. This is the most precise method of quantification, provided consumption data are complete, accurate, and properly adjusted.

The main source of consumption data is LMIS. This system contains data on consumption which are dispensing data from dispensing registers or other point-of-service registers.
Consumption data is typically retrospective data on the quantities of ACT and RDTs that have been dispensed to patients within a particular period. When these data are not available, reports of stocks issued from the lowest level possible may be used. However, using issue data as a proxy for consumption data can result in an overestimation or underestimation, because quantities issued may not correlate well with the actual quantities dispensed.

Consumption data may be reported monthly or quarterly and may be aggregated with clinical and patient-specific data to enable observation on whether the consumption matches the number of cases treated.

Reporting rates of less than 50% should be considered unacceptable to use for quantification data. At very low levels of reporting (<50%), there will be serious inaccuracies.

Limitations of the consumption method

- Complete consumption data from a full supply are hard to find, so programs tend to settle for data extracted from a system with interrupted supplies and a non-full supply system
- The consumption data might not reflect rational use of the products (i.e., use according to the STGs)
- It cannot be used for a program that is new or scaling up, where consumption is unpredictable

Incomplete consumption data may be adjusted. Adjusted consumption is the monthly consumption adjusted considering the number of days of stockout and the morbidity information.

In the absence of quality consumption data from health facilities and community health workers, the morbidity-based quantification method can be used.

Morbidity method estimates the need for specific medicines based on the expected number of attendances, the incidence of common diseases, and standard treatment (as per national STGs) for the diseases and then translates these into the number of products expected to be consumed. This method is based on morbidity statistics, prevalence and morbidity data are used to estimate national-level prevalence of a disease and are usually available through routine information systems or surveillance or research and extrapolated to obtain national-level estimates. Morbidity data are usually expressed as incidences per 1000 or 100,000 population.
Incidence is a measure of disease that allows us to determine a person's probability of being diagnosed with a disease during a given period.

Limitations of this method

- Compared to the other methods, the morbidity method is the most complex and time-consuming.
- It requires conversion of sick people to medicines
- Morbidity data may not be easily available for the disease condition
- This method requires strict adherence to the STGs, but standard treatments may not be used or correctly followed by prescribers in that area

How to calculate the quantity to be ordered:

The quantity to be ordered is obtained using the following formula, based on consumption:

Quantity to be ordered = AMC_j X (LT+OP) +SS-(SOH+SO)

AMC_j: Adjusted average monthly consumption
LT: Lead time
OP: Ordering period
SS: Security stock
SOH: Stock on hand
SO: Stock on order

If the result is >0, then the calculated amount must be procured for the program to satisfy estimated demand and still maintain the desired stock at end of the period.

If the result is <0, there is a possible oversupply situation; in such cases, no procurement is needed for the period.

Formula based on morbidity:

$QE=DXD_DXT_D$
QE= Quantity to order by condition episode D= Quantity per dose per day
D_D= Frequency of dose per day T_D= Treatment duration

Other methods include:

Proxy consumption method: Proxy consumption method is used when there are no consumption and morbidity data for a standard system (known facility with standard and known data). The method involves extrapolating information for use from a facility that have consumption and morbidity data. Both facilities must share the same characteristics such as service to same population in the same geographic and climatic environment.

Proxy consumption method also mean the use of issue data for forecasting instead of dispense-to-user /consumption data. The issue data that is advisable are the ones from the health facility stores to the dispensary. The father the issue data is to dispense-to-user data, the more inaccurate the forecast.

NB: If central level data are incomplete, but data exist for some representative or standard facilities or districts, the proxy consumption method can be used.

Steps for using Proxy consumption-based method for forecasting

- Select the standard system for consumption and extrapolation
- Review records from the standard system for the determined review period
- Calculate the adjusted consumption in a review period
- Calculate the projected average monthly consumption for expected changes in consumption pattern
- Obtain the total projected average monthly consumption
- Obtain the total projected consumption in the review period
- Obtain rate of consumption use per 1000 treatment episodes
- Obtain the projected amounts of products needed in the target system

Issues to consider in quantification (forecasting and supply planning)

- Preparing an action plan for quantification
- Using centralized or decentralized quantification approach
- Using manual or computerized methods for quantification
- Estimating the time required
- Developing and organizing the medicines list
- Filling the supply pipeline
- Estimating the procurement period
- Considering the effect of lead time
- Estimating safety stock
- Adjusting for losses and other changes
- Cross-checking the results of quantification
- Estimating total procurement costs
- Adjusting and reconciling final quantities
- Preparing for possible program expansion
- Reconciling forecasts of different data sources

Reviewing quantification for ordering

Quantification does not end after determining the final quantities and costs. It involves an ongoing process of monitoring, reviewing, and updating the forecasting data and assumptions, and recalculating the total commodity requirements and costs as needed. For the quantification exercise to be useful and more effective, the forecasting assumptions and supply plan should be reviewed at least every six months. Ongoing monitoring and updating of the quantification lead to making timely decisions.

Reviewing and updating the quantification includes the following activities:

- Reviewing and updating the forecasting data and assumptions
- Calculating or recalculating the forecasted consumption
- Updating the stock on hand for each product
- Assessing national stock status for each product
- Reviewing and updating shipment delivery schedules to ensure continuous supply and maintain desired stock levels
- Computation of forecast accuracy for tracer products as a means of verifying some assumptions used in a forecast such as scale up rate

Selection and Quantification online resources

https://www.undp-psmtraining.com/login/index.php https://www.undp-psmtraining.com/course/view.php?id=2&section=2 https://www.undp-psmtraining.com/course/view.php?id=2&section=3	
https://elearning.jsi.com/mod/scorm/view.php?id=1	Topic 8
https://www.youtube.com/watch?v=M1c-jR_hPMg	The Art of forecasting video
http://supplychainhandbook.jsi.com/wp-content/uploads/2017/01/JSI_Supply_Chain_Manager's_Handbook_Chpt.4_Final.pdf	Product selection
http://supplychainhandbook.jsi.com/wp-content/uploads/2017/01/JSI_Supply_Chain_Manager's_Handbook_Chpt.5_Final.pdf	Quantification
https://www.msh.org/sites/default/files/mds3-jan2014.pdf	
https://www.jsi.com/JSIInternet/Inc/Common/_download_pub.cfm?id=11497&lid=3	
https://www.youtube.com/watch?v=Hwsa6Epm568	Quantification for Community Case Management

All online resources are free, and you will need to create an account as some of the links requires to access training. For the UNDP link, register with a non-UNDP email address

Unit 3: Procurement

Objectives

By the end of this chapter, users will be able to:

- Define procurement and related terms
- Describe the purpose of procurement
- Understand the procurement cycle
- Describe Good pharmaceutical procurement practices and management
- Describe procurement principles and methods
- Describe procurement process
- Identify procurement key stakeholders
- Be familiar with guidelines on prequalifying suppliers
- Define Pharmaceutical quality
- Describe the purpose of quality assurance
- Understand how to assess pharmaceutical quality
- Describe the determinants of pharmaceutical quality
- Explain practical approaches to quality assurance
- Describe quality verification of procured pharmaceutical products
- Explain pharmaceutical quality monitoring
- Identify risks in procurement process

3.1. Introductions

Procurement is the procedure through which an entity acquires good or services from suppliers in return for a price. Procurement is a major determinant for health products/technologies availability and utilization. Therefore, procurement process should be ensuring the supplier and buyer relationship should be transparent and ethical, right medicines are procured in the right quantities, quality standards are met while doing procurement, timely delivery is attained to prevent stock-outs and purchasing schedule is prior to procurement process.

Procurement Incoterms are a set of rules, which define the responsibilities of sellers and buyers for the delivery of goods under sales contracts. Each term conveys a set of pre- determined rules that parties should acknowledge, agree to and abide by.

Table 1: Procurement Incoterms

TYPE OF INCOTERMS	COMMENT
FOB (Free on Board)	It states that the seller's responsibilities include everything up to getting the goods loaded onto the vessel at the agreed port. The first charge to the buyer is the freight costs and then they are responsible for all the costs to get the goods to their destination.
EXW (ExWorks)	It states that pretty much everything is the responsibility of the buyer. The only obligation the seller has is to make the goods available for collection. The buyer pays all the costs to get the goods from the supplier to the destination. When written, Ex Works shipping terms are often followed by the supplier's collection address which is where the buyer's responsibility starts.

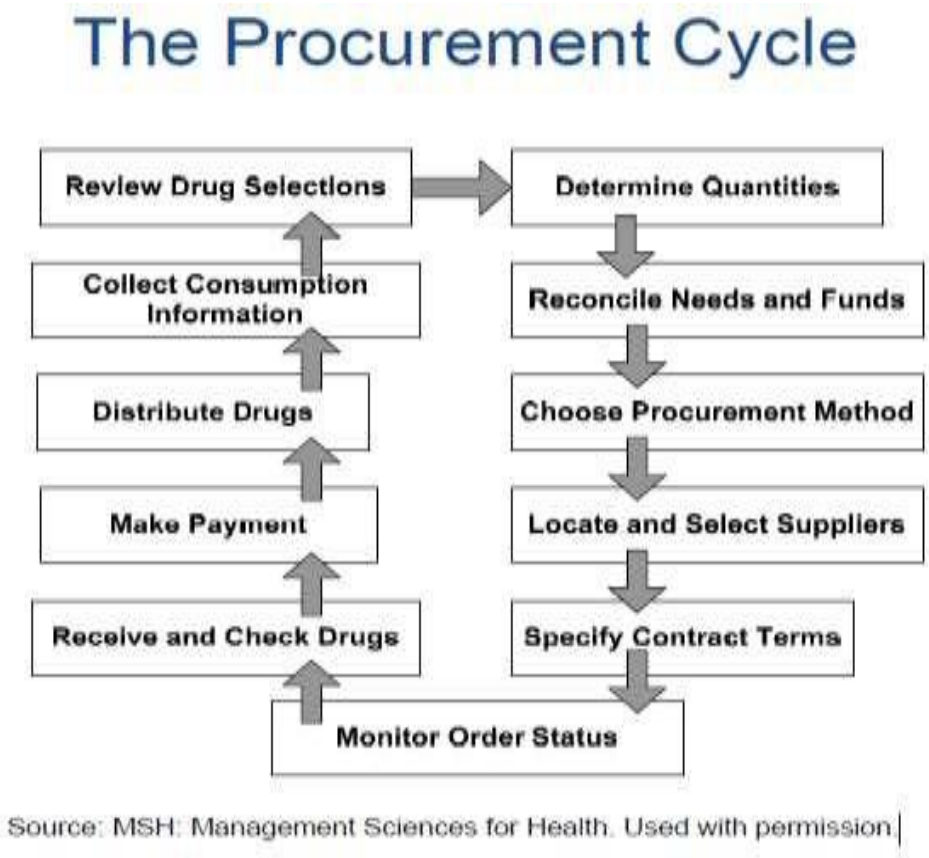
CFR (Cost and Freight)	When using CFR shipping terms, the seller's invoice includes the cost of the goods, and the freight to send them to the agreed country. The seller pays for everything up to and including the freight to a named destination port, the first charge to the buyer is the terminal handling at the destination port. CFR terms can look attractive but in reality, it's very difficult for the buyer to control their costs.
CIF (Cost, Insurance and Freight)	The buyer will also include insurance in the cost. The buyer pays for everything after the goods arrive at the destination just as in CFR terms. Like CFR terms, when using CIF terms, it can be very difficult for the buyer to control their costs.
DAT (Delivered at Terminal)	Shipping terms state that the seller bares all of the responsibility up to and including unloading the goods at the named terminal at the destination port. The buyer pays for customs clearance, import duties, taxes and delivery costs.
DAP (Delivered at Place)	Delivered at place terms state that the seller pays for and takes responsibility for everything involved in the shipment all the way to delivering to an agreed destination. All the buyer pays for is import duties and taxes.
DDP (Delivered Duty Paid)	For the buyer, this is a great option for minimizing risk. DDP terms mean that the buyer will purchase the goods before the seller pays all the costs to get the shipment to its destination. The seller also pays any import duties and taxes accrued in the buyer's country of delivery. All the buyer must do is unload their goods from the truck parked outside.
FCA (Free Carrier)	It requires the seller to deliver the goods to a named location where the designated carrier operates. The seller also clears the goods for export from the country of origin. After this point all costs, risk and responsibility lie with the buyer.
FAS (Free alongside Ship)	This term states that once the seller has done everything up to getting the goods alongside the ship ready for loading, they have fulfilled their obligations. This includes customs clearing the goods for export. The first charge for the buyer is terminal handling at the port of origin
CPT (Carriage Paid To)	Carriage Paid To' terms are very similar to CFR shipping terms, the difference being that CPT terms can be used in any mode of transport (Air/Sea etc).

3.2. The purpose of procurement in health supply chain is to:

- To manage risk associated with purchasing and dealing with suppliers
- To ensure the right products and their specifications are provided for health programs via the following:
    1. Promote transparency and accountability by using documented procedures, transparency criteria for the selection of suppliers, and regular reporting to the donors/government based key performance indicators in the procurement assessment plan
    2. Ensure that the products meet national quality requirements and are featured on the essential medicines and national formulary lists
    3. Ensure that medicines to be procured are identified using their international nonproprietary name
- Acquire the largest possible quantities to achieve economies of scale and savings.
- Ensure suppliers are pre-qualified to supply quality products, reliable services based on defined criteria.

3.3. The Procurement Cycle

Diagram 3: The Procurement Cycle



Source: MSH: Management Sciences for Health. Used with permission

The procurement cycle includes most of the decisions and actions that need to be followed for the procurement process to be more efficient.

3.4. Good Pharmaceutical procurement practices and management

Pharmaceutical procurement practices vary widely from country to country. However, decades of experience with essential medicines programs and many more years of experience with large government-run pharmaceutical supply services in many countries, as well as regional and global pooled procurement schemes, a number of key procurement principles have been suggested to promote good pharmaceutical procurement.

3.5. Good Pharmaceutical procurement practices and principles

Pharmaceutical procurement practices vary widely from country to country. However, decades of experience with essential medicines programs and many more years of experience with large government-run pharmaceutical supply services in many countries, as well as regional and global pooled procurement schemes, a number of key procurement principles have been suggested to promote good pharmaceutical procurement.

3.6. Good Pharmaceutical procurement principles

- **Reliable payment and good financial management**: this includes developing mechanisms for prompt and reliable payment, which might bring down prices more than bulk discounts. Establishing financial mechanisms with separate pharmaceutical accounts to allow procurement cycle to operate on a separate schedule from the treasury cycle.
- **Procurement by generic name** (International Nonproprietary Names) for fair competition and specify quality standards for medicines with similar bioavailability problems.
- **Procurement should be limited to essential medicines or formulary lists** for safe and cost-effective medicines to be procured.
- **Procurement in large volume** to reduce total prices
- **Formal supplier qualification and monitoring:** this include using formal supplier qualification based on pharmaceutical quality, service reliability of pharmaceutical sources with certificates of analysis, sound knowledge of good manufacturing and distribution practice and financial viability, licenses and registration with government. Approve suppliers before tendering (prequalification) or after (post qualification) and use a formal monitoring system to ensure continued supplier qualification.
- **Competitive procurement** to obtain the best prices, allow only prequalified suppliers to compete in restrictive tenders, and evaluate suppliers after submission of bids in open tenders.
- **Monopsony commitment:** this includes procuring all contracted pharmaceuticals from winning supplier in a particular bid for which the supplier was preferred and enter into no separate deal with noncontracted suppliers.
- **Order quantities based on reliable estimates of actual need**: Realistic need developed from actual quantification with detailed specification is meant for procurement.
- **Transparency and written procedures:** this include developing and follow on written procedures for all procurement actions and make information on the tender process and results public to the maximum extent possible.
- **Separation of key functions:** this includes separating key functions that require different expertise and functions that involve different committees or individuals.

- **Product quality assurance program:** this include establishing and maintaining a formal system for product quality assurance including product certification, inspection and targeted laboratory testing.
- **Annual financial audit with published results:** this include conducting an annual financial audit to assess compliance with procurement procedures, promptness of payment, and related factors, and present results to the appropriate public supervising body.
- **Regular reporting on procurement performance:** this includes reporting key procurement performance indicators against targets at least annually and use of key indicators such as ratio of prices to world market prices, supplier lead times, percentage of purchases made through competitive tendering, and planned versus actual purchases.

Fundamental Procurement Principles applied in Rwanda are:

- **Transparency** means applying procedures in a manner which is open, clear, easily accessible, and predictable. Bidders should see the procurement as being transparent.
- **Competition** means providing the bidders with equal opportunity and treatment in bidding for procurement contracts. Competition should be seen to be open and fair.
- **Economy:** Procurement should prioritize the best value for money, with value comprising both price and quality. The lowest initial price may not equate to lowest cost over the operating life of the item procured. The ultimate purpose of sound procurement is to obtain maximum value for money.
- **Efficiency** means being simple, timely, practical, and adhering to the budget of the procuring entity to achieve positive results without any unnecessary delays in the program implementation.
- **Fairness is** about being impartial, consistent, and reliable.
- **Accountability** is about bestowing a sense of responsibility by enforcing established rules and procedures. Good procurement holds its practitioners responsible for enforcing and obeying the rules.

3.7. Methods used for public procurement

3.7.1. Open method

This is a formal procurement process in which local or international suppliers (or their representatives) are invited to submit bids. It allows for the widest selection of potential suppliers, but it is time-consuming and complex.

3.7.2. Closed or restricted method

This method restricts bidding to suppliers who meet certain conditions, e.g., suppliers with certain financial capacity or suppliers producing health commodities of a certified quality.

3.7.3. Request for quotations

The procuring entity may request quotations from at least three bidders. Request for pricing of products that is based on defined specification.

3.7.4. Single-source procurement or direct contracting

Products are purchased directly from one supplier. This is the simplest method but very expensive because purchasers do not seek better value by checking out other suppliers.

Table 2: Different procurement methods with advantages and disadvantages of each.

When it comes to pharmaceuticals and other medical products, quality is non-negotiable. Any deployed procurement method must deliver quality medical products, or the patient suffers or even die.

Method	Advantage	Disadvantage
Open	• Competition (tender is open to all) • Low prices • Transparency • New suppliers, experience, and technologies	• Long time in assessment due to many bids • High workload • Long lead times • Need for assessment is high
Restricted	• Known suppliers (in terms of performance) • Prices are usually favorable	• Less price competition • No chance to get new suppliers • Less transparency • Long time in establishment (prior prequalification of suppliers) • Need for assessment is high
Request for quotations	• Known suppliers • Reduce prices • Short lead times • Prices can be favorable	• Less transparency • Need for assessment is high
Direct purchase (Single source tender)	• Very short lead time • Low workload	• High prices • No competition • Need for assessment is high

3.8. Procurement process

Competitive tenders are recommended for most pharmaceutical systems, to maximize the benefit of pharmaceutical purchases, and minimize corruption and favoritism in procurement. A formal tender process includes procurement planning, preparation of tender documents, collation of offers, publication, motivation to bid, formal bid opening, evaluation, notifications, contract awarding, performance monitoring and evaluation.

Procurement tenders can be structured as follows:

- Restricted versus open tender
- Local or international
- Estimated or fixed tenders
- Split or single tender awards
- Primary/secondary contracts or rebids
- Required or optional use of local agents in international tenders
- Annual or biannual tenders versus multiple tenders in a year

3.9. Assuring Pharmaceutical Quality in Procurement

Pharmaceutical quality

The quality of pharmaceutical products is determined right from the starting materials, equipment, and technical know-how that go into producing ang packaging it. Unlike a steel, a medicine is a dynamic product whose color, consistency, weight, and even chemical identity can change between manufacture and ultimate consumption. A medicine that passes all laboratory tests upon receipt may be useless within a few months if the packaging, storage, and transportation conditions are not maintained properly.

The purpose of quality assurance

Pharmaceutical quality assurance is done to help ensure that each medicine reaching a patient is safe, effective, and of appropriate quality. Note that quality assurance in pharmaceutical supply is not the same as quality control in manufacturing. The quality assurance framework includes document review, inspection of local/imported product samples or manufacturing sites or marketplace, product testing and reporting. Once these activities are done, analysis and evaluation of data obtained from these activities lead to decision making and enforcement to ensure patients are using quality medicines.

Assessing poor pharmaceutical quality

Quality of medicines can be defined and tested in many ways, but the most common way is assessing medicines compliance with specifications concerning identity, purity, strength, potency. A poor-quality medicine is one that does not meet these specifications and the use of such medicine may lead to undesirable clinical and economic effects. Clinical effects can include prolonged illness or death or adverse reactions. On the economic side, limited financial resources may be wasted on poor-quality medicines which may lead to poor health system credibility from prolonged illnesses even with medication.

Determinants of pharmaceutical quality

The quality of a medicine product coming off the production line is determined by the start- up materials, plant environment, manufacturing equipment, and technical know-how invested in developing and manufacturing the pharmaceutical. The medicine that ultimately reaches the patient, however, is further affected by packaging and by transportation and storage conditions. Things to consider under start-up materials that determine the quality of medicines include the quality control of the manufacturing process, pharmaceutical formulation, active ingredients, immediate packaging, external packaging, shipping conditions, port conditions, transportation conditions, warehousing conditions, repackaging procedures, storage conditions, dispensing conditions and patient handling. Temperature, humidity and cleanliness are things to consider under plant environment, one of the four main determinants of pharmaceutical quality.

Global quality-monitoring options

The procedures to establish a comprehensive quality assurance program can be divided into three categories:

1. **Procedures to ensure that only medicine products that meet current standards for quality are bought.** These include:

- Careful product selection
- Careful supplier selection
- Certificate of analysis for each batch of product
- Certification of good manufacturing practices
- Batch certification (WHO-type certificate of pharmaceutical product)
- Inclusion of detailed product-quality specifications in the contract

2. **Procedure to verify that shipped goods meet the specifications.** These include:

- Pre-and post-shipment inspection
- Analytical pharmaceutical testing

3. **Procedures to monitor and maintain the quality of pharmaceuticals from the moment they are received until the medicine is finally consumed by the patient**. These involve:

- Proper storage and distribution procedures
- Appropriate dispensing
- Instructions to the patient on proper use of medications
- Product defect and pharmacovigilance reporting programs.

Verifying the quality of shipped products

The quality of products received should be verified as soon as possible by physically inspecting each shipment and testing selected products in the laboratory as required by regulation. In addition, more advanced product-tracking technologies have been introduced to help ensure the integrity of the pharmaceutical supply chain.

Maintaining and Monitoring pharmaceutical quality

This refers to maintaining medicine quality during storage conditions and transport down to when pharmaceutical products are being dispensed to patients. Despite every effort, defective products occasionally slip through, and the quality of even the best-manufactured product may deteriorate. For monitoring purposes, quality assurance program staff should carefully analyze all reports like using laboratory testing reports. If problems are identified through lab testing, product problem reports should be generated to provide information for product recalls.

Table 3: Examples of questions during supplier's selection process and or prequalification

Status	Is the supplier a primary manufacture or distributor? Does the supplier manufacture all products in-house? Who is the primary manufacture for each product offered?
Quality control	Does the supplier use good manufacturing practices? Does the supplier have an on-site quality control laboratory? What tests are routinely performed? (before and after manufacture) Are special tests performed for stability in tropical areas?
Inspection	What official have inspected the facility? What are the results of the most recent inspections? What certification documents available from regulatory agency?
Personnel and facilities	What are the qualifications of key personnel? What is the capacity of the supplier's plant? Does the supplier have the capacity to supply? Will the supplier have to subcontract portions of large awards?
Trade references	What other local or foreign buyers work with the supplier? How long has the supplier served the above? What is the experience of buyers with this supplier?
Financial status	Is the supplier financially stable? Will the supplier's existence remain for the entire contract period?
Corporate associations	Is the supplier a subsidiary, a parent or known by another supplier? How long has the supplier been supplying the goods?
Local reputation	How is the supplier regarded by local buyers or prescribers? How are products of the suppliers regarded by the same? Is there any information from public sources concerning his performance?

3.10. Procurement performance indicators

- Percentage by value of Ministry of health (MOH) medicines purchased through a central procurement system (Formula: Value of procured products by Public Central Medical Store/Value of tendered products x 100)
- Percentage by value of MOH medicines purchased through competitive tender (Formula: Value of products procure through competitive tenders/ value of all procured products x 100).
- Percentage by value of medicines purchased from local manufacturers (Formula: Value of products procure form local manufacturers/ value of all procured products x 100)
- Average lead time for a sample of orders (Calculated separately for all suppliers, local manufacturers, foreign suppliers) (Formula: Number of days or months for a specific supplier to deliver health products for a defined period)
- Average time for payment for a sample of orders (calculated separately for all suppliers, local manufacturers, foreign suppliers) (Formula: Number of days or months in excess for public central medical store to pay specific supplier from the contract defined payment period/time)
- Percentage of pharmaceuticals (batches) that failed quality control tests (Formula: Number of batches that fail QC tests/ Total number of batches submitted for QC test for defined periodx100).

3.11. Key procurement stakeholders in Rwanda

- Rwanda Biomedical Center (RBC)
- Rwanda Medical Supply Ltd (RMS Ltd)
- BUFMAR
- RMS Ltd Branches
- Referral, provincial, and district hospitals
- Teaching hospitals
- Health Centers Health Posts
- Rwanda Public Procurement Authority (RPPA) Ministry of Health
- Ministry of Finance
- Donors/ Health related Non-governmental Organization Private sector
- Health Insurances
- Other health-related nongovernment organization Ministry of Infrastructure
- Rwanda Food and Drug Authority (Rwanda FDA)

3.12. General Procurement Steps for Pharmaceuticals

Step 1: Need Identification stage
Every procurement begins with the demand by a client. The demand of several clients can be pooled together. Product selection and quantification determine medicine needs and demand of a country or a program. The essential medicine needs are generated at central supplying organizations (RMS Ltd and BUFMAR)
Step 2: Specification stage

A standard product list to include generic names, pack sizes, packaging, labelling and the time the product is to be delivered is determined in this stage. The technical officers at central supplying organizations (RMS Ltd and BUFMAR) work to get these specifications for correctness. The procurement process takes time and it is advisable to get this right.

Step 3: Source Options
The technical officers at central supplying organizations (RMS Ltd and BUFMAR) need to determine where to obtain the product. There may be pre-qualified vendor list. If not, they will need to search for a supplier using appropriate tender process and procurement method allowable by the procurement policy.

Step 4: Price and Terms
The technical officers at central supplying organizations (RMS Ltd and BUFMAR) will investigate all relevant information to determine the best price and terms for the product and review multiple suppliers/vendors before making final decisions.

Step 5: Purchase Order
The need, price, specifications and terms and conditions of the product or service and any additional obligations are used to create a purchase order. The purchase order is used to engage the vendor. There becomes a binding contract with terms and conditions

Step 6: Delivery
The purchase order is delivered, usually by fax, mail, personally, email or other electronic means. Sometimes the specific delivery method is specified in the purchasing documents. The recipient then acknowledges receipt of the purchase order. Both parties keep a copy on file.

Step 7: Expediting and Procurement follow up
The RMS Ltd follow up with vendor to provide status of the order placed regularly. This is to manage expectations and timeliness of products delivery. It becomes especially important to have a plan B if there are any delays. Also, payment of vendor for products delivered should not be delayed.

Step 8: Receipt and Inspection of Purchases
Once the vendor delivers the product, RMS Ltd warehouse and technical officers accepts or rejects the items. Acceptance is based on thorough physical inspection of delivered products to ensure they meet with specifications stated in the procurement order. These include the pack size, shelf life of product at the time of receipt, quantity and quality of the pharmaceuticals etc. Acceptance of the items obligates the payment automatically. Evidence of delivery is the proof of delivery (POD) which must be signed by recipients.

Step 9: Invoice Approval and Payment
Three documents must match when an invoice requests payment - the invoice itself, the receiving document and the original purchase order. The agreement of these documents provides confirmation from both the RMS Ltd and the vendor/supplier. Any discrepancies must be resolved before the recipient pays the bill. Usually, payment is made in the form of cash, check, bank transfers, credit letters or other types of electronic transfers by the Rwanda Biometric Center (RBC).

Step 10: Record Maintenance
In the case of audits, the warehouse and procurement unit must maintain proper records. These include purchase records to verify any tax information and purchase orders to confirm warranty information.

Procurement online resources

All online resources are free, and you will need to create an account as some of the links requires to access training. For the UNDP link, register with a non-UNDP email address.

https://www.undp-psmtraining.com/course/view.php?id=2&section=4 https://www.undp-psmtraining.com/course/view.php?id=2&section=6	
https://www.youtube.com/watch?v=QJNVrY_Z2NM&list=PLCD3E338A3E58E906&index=11	Quality Management video
http://supplychainhandbook.jsi.com/wp-content/uploads/2017/01/JSI_Supply_Chain_Manager's_Handbook_Chpt.6_Final.pdf	Procurement
https://www.msh.org/sites/default/files/mds3-jan2014.pdf	
https://www.jsi.com/JSIInternet/Inc/Common/_download_pub.cfm?id=11497&lid=3	

Unit 4: Inventory Management (Receiving, Storage, Inventory Control, and Distribution)

Objectives

By the end of this chapter, participants will be able to:

- Define inventory management and its importance
- Define receiving process of health products and its importance
- Demonstrate the process of receiving health products
- Define good storage practice and its importance
- Describe key storage activities and procedures
- Describe cold chain storage instructions
- Discuss inventory management control terms
- Explain the management of donations
- Explain the management of unusable pharmaceutical products
- Define distribution and its importance
- Discuss good distribution practices
- Explain the national distribution system

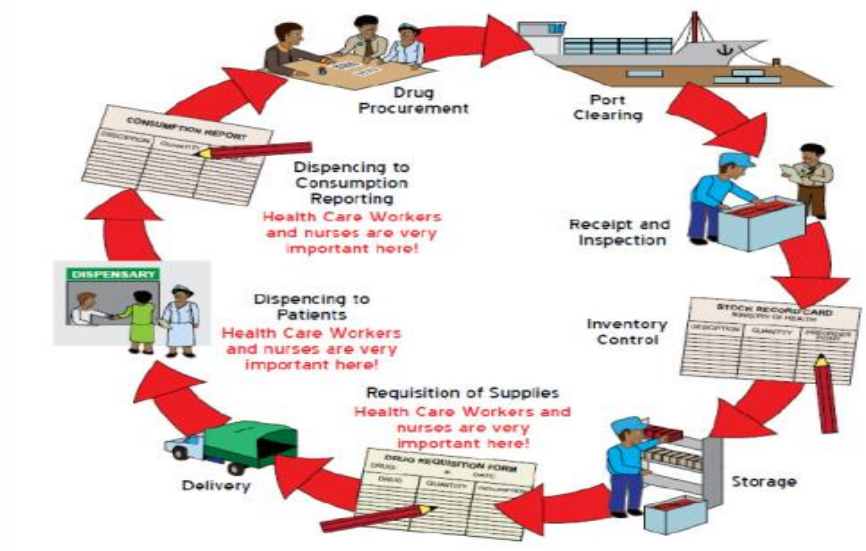
4.1. Inventory management

Inventory management is not difficult, but it requires recognition of the value of health supply chain management to the public health system. Therefore, the government should be committed to mobilize funds and resources to ensure health supplies are well managed and do finally get to end-users timely.

4.1.1. Inventory management

comprises the activities related to ordering, receiving, storing, distributing and issuing, and re-ordering commodity stock. All these activities are tracked and documented; thus, good record-keeping is critical. There are two types of orders. Procurement orders which are received in central or regional warehouses and re-supply orders/requisitions which are received in the health facilities and from the warehouses/RMS Ltd Branches

Diagram 4: Inventory Management Cycle



4.1.2. Importance of inventory management

Inventory management is important for the following reasons:

- To ensure availability in most drug supply systems
- To maintain patient and health facility personnel confidence in the health care system
- To avoid the costs of stockout: If emergency orders are needed to prevent or manage a stockout, the unit cost will likely be much higher than for a regular order.
- To avoid the costs of excess stock and product loss
- To minimize procurement costs: Procurement costs increase when products are ordered frequently.
- To minimize transport costs: Good inventory management will enable less frequent deliveries of health commodities, allowing more efficient use of transportation.
- To cope with variability in demand: Changes in demand for specific health commodities are often unpredictable, and adequate stock management allows the system to mitigate the effect of variability in demand.
- To monitor quality of medicines through visual inspection

4.2. Receiving products

4.2.1. Receiving products

Receiving products is one of the steps of supply chain cycle where purchased or/and donated products are distributed within a health institution and all stock are processed for storage in accordance with requirements. A staff member should receive all orders at the time of delivery. A reception committee receives and checks products and makes reception reports that serves as reference for administration purposes (feedback to suppliers, payment if applicable). In case any products are refused, the reception committee fills out and signs the commodity return form with approval by the top facility manager, and products are returned to the supplier (see commodity return form in appendix).

4.2.2. Importance of receiving products

- Guarantee the quality of products
- Ensure the availability of right quantity
- Avoid financial losses caused by products ordered but not received, damaged, and/or expired

Detailed steps for receiving commodities are described below

A. Check the quantity of received products:

1. Check for pilfered or damaged products

a. Check all the boxes ordered.
b. Check if any of the boxes have been opened, are wet, or are damaged.
c. If any order is not complete or stock is damaged, contact the RMS Ltd Branch.

2. Check the products received against the items on the purchase order and delivery notes:

a. The RMS Ltd Branch includes delivery notes and invoices with the details of products supplied.
b. Remove the products from the box and group all items that are the same together.
c. Read the delivery notes and check off each item.
d. Check received products against ordered ones on the purchase order.
e. Make sure that the quantity received have a good shelf life.

B. Check the quality of received products.

To check for signs of damage or deterioration:

a. Check refrigerated items.
Refrigerated items should be stored first. If refrigerated items are not packed in cold packs, do NOT accept them. If refrigerated items are not cold, contact supplier.

b. Check the color of products.
If products are discolored, they have deteriorated; do NOT accept them.

c. Check for broken containers. Check for leaks.
Carefully remove broken containers. If there is a leak, remove any products damaged from the leak.

d. Check for unsealed or unlabeled items.
If items are unsealed, someone may have tampered with them. Also, it is dangerous to use unlabeled items. Do NOT accept them.

e. Check for unusual odor of products.
If products have unusual odors, they may have deteriorated. Do NOT accept them.

f. Check injectable liquids.
Shake the vial and then hold it to the light. Clear liquids should have no particles that reflect light. If a vial has small particles, the medicine has deteriorated. Do NOT accept the vial.

3. Sign documents related to product delivery (e.g. delivery notes)

After checking the products, all parties should sign delivery notes. However, if the products are not checked for any reason, the documents should be indicated as "**unchecked."**

4. Fill in management tools (e.g. stock cards, eLMIS)

After checking and signing documents, an authorized person should fill in management tools according to standard operating procedures (SOPs)

5. File signed delivery notes, invoices and purchase orders

Authorized persons should file the related documents appropriately. A copy of delivery notes will be filed in main store while original invoices, delivery notes, and purchase orders will be sent to financial departments.

6. Ensure the storage area is enough, clean and in good condition

4.3. Storage

Storage is keeping health products in a safe, secure, accessible location while awaiting to be used.

4.3.1. The importance of good storage

Good storage conditions ensure that the quality of the products is maintained.

4.3.2. Key storage activities

The key storage activities in the supply chain are medicines receiving, visual inspection, put away (putting supplies in their respective storage areas), picking, and packing.

Visual inspection of delivered products is done to ensure there are no damages during transport.

What to look for when conducting visual inspections:

- Number of containers delivered is correct
- Number of packages in each container is correct
- Quantity in each package is correct
- Drug is correct (do not confuse generic and brand names)
- Dosage form is correct (milligrams, percentage concentration, other measurements)
- Unique identifiers are present, if required (article code, Ministry of health stamp or other codes)
- No visible evidence of damage (describe if present)

4.3.3. Storage procedures

Irrespective of the location system, medicines must be stored within each zone in a way that would make them easily accessible to personnel while protecting their integrity. They can either be put on shelves (for small volume and weight), pallets, block-stacked pallets, and pallet racks.

The storage room has designated areas for receiving, usable stock, and quarantine space. The quarantine space can be divided for unusable products to be disposed, and for products awaiting a quality control check.

4.3.4. Storage best practices

1. **Always follow manufacturer or shipper's directions when stacking and follow labels for storage conditions**
2. **Keeping products in a store makes it easy to always know what is available.**

It is also an easy way to keep products safe. The store should be large enough to fit all the products.

The store should be a secured room or locked cupboard. To secure the store, keep it locked and give keys only to persons who are responsible for the supplies in the store. Keep an extra set of keys in a safe place. Secure all openings with grills or bars to prevent theft. Keep the store locked always when it is not in use.

3. Keep the store in good condition.

High temperatures, light, or humidity may damage products. Heat affects liquids, ointments, and suppositories. Some medicines, such as injectables and eye or ear drops, spoil quickly when exposed to light. Tablets and capsules can easily absorb water from the air, making them sticky and damaged.

The following actions are needed to keep the products in good condition:

a. Inspect the physical structure of the store regularly.
Repair any damage to the roof, walls, door, windows and floor.

b. Control the temperature in the store.
Check that there is a ceiling in the store.
Allow warm air to escape.
Open the door and windows while someone is in the store. Install air vents/conditioners.
Record temperature twice a day.

c. Control the light in the store.
Block any direct light that enters the store through windows.
Either paint the windows white or hang curtains.

d. Control humidity (moisture) and prevent water damage.
Check that there is good drainage. There should be drainage channels around your store.
The roof should have gutters. Secure drainage areas.
Allow air to move freely. Secure air vents and windows.
Repair leaks as soon as they occur to reduce moisture and water damage. Containers of tablets and capsules may be packed with a sachet of desiccant (nonedible drying crystals). The desiccant keeps the inside of the container dry. Do NOT open the sachet. Keep the sachet in the container. Keep the container closed except when dispensing medicines. Keep all cartons on pallets.

e. Keep the store free of insects and pests.
Some common pests are rats, roaches, ants and wasps.
Clean spills, which may attract pests and remove broken containers immediately.
Use screens to keep out insects.

4. Keep your store clean and organized.

In a clean and organized store, it is easy to find products.
The supplies are likely to be in good condition and ready to be used.

To organize the store:

a. Clean the store and keep it tidy.
Dust contaminates products and makes labels difficult to read. Spills and breakages collect dirt. Mop the floor, dust the shelves, and wipe down the walls regularly. Do not sweep the floor in the storeroom.

b. Store products on shelves.

Using shelves is an easy way to organize products. Place the boxes or boards on pallets. Do NOT put boxes or boards directly on the floor, which might be wet. Moisture can rot the cardboard or wood.

How to store health commodities on shelves

- Arrange products on shelves off the floor in groups according to your order form e.g. externals, internals, and injectables).
- Store tablets, capsules, and other dry medicines (such as ORS packets) in airtight containers on the upper shelves.
- Store liquids, ointments, and injectables on the middle shelves.
- Do not put dry medicines below them.
- If liquids leak, the dry medicines may spoil. Otherwise, liquid products can be kept on the bottom shelves.

c. Products arrangement in a small store.

Products can be arranged in one of three ways in small stores.

1. **Alphabetical order by generic name**

   Often seen in both large and small facilities. Arrange and label medicines by the generic names in alphabetical order and allow enough space for each item. Print the label and attach to the front of the shelf. Group products by expiry dates following FEFO method.

2. **Therapeutic or pharmacologic category**

   Most useful in small storerooms or dispensaries where the health care worker knows what the medicines are used for (e.g. antibiotics, pain, non- communicable diseases).

3. **Dosage form**

   Medicines come in different forms, such as tablets, syrups, injectables, and external use products such as ointments and creams. In this system, medicines are categorized according to their dosage.

Note: Arrange cartons above the shelve or on the pallet but not on the floor. Make sure identification labels, expiry dates, and manufacturing dates are visible, if not, write all this information on the visible side of the carton.

1. **Products arrangement in a larger store (warehouse)**
   1. **Health system level: In** this system, items for different levels of the health care system are kept together.
   2. **Frequency of use:** Fast-moving products are placed in the front of the working area in this system, to minimize the amount of movement required to pick and pack the items that are ready for dispatch to the customer.
   3. **Random location:** A specific storage space, such as a pallet or shelf, is assigned a unique location code that corresponds to its aisle, shelf, and position on the shelf.

2. **Keep some products in an environment with controlled access**

Identify products that are at risk of theft or abuse or have legal or regulatory requirements in a controlled access area. Controlled products include medicines such narcotics, opioids, strong analgesics, psychotropic medicines, ARVs and ACT.

4.3.5. Products that require special storage conditions

Storage of flammable and corrosive products require special temperature-controlled conditions as follows:

- **Flammables:** Some flammable liquids such as acetone, anesthetic ether, alcohols and kerosene should be kept in a separate location away from the medicines. Instead, they should be kept in a steel cabinet in a well-ventilated area, away from open flames and electrical appliances in the store.
- **Corrosives**: these are substances such as acetic acid, concentrated ammonia solutions, silver nitrate and sodium nitrate. These too should be stored in a separate steel cabinet to prevent leakage. Protective gloves and eyeglasses should be used when handling these items.

- **Temperature-controlled products:** The potency of vaccines, blood products, test kits, and many other items depends on cold storage. Vaccines, in particular, must be kept at precisely controlled temperatures from the point of manufacture to the point of administration.

4.3.6. Cold chain storage instructions

Cold chain is the supply system used to keep vaccines and other medical supplies at full strength by keeping them at **temperature suggested by manufacturers**. This temperature needs to be maintained from the manufacturer until the moment the vaccine is used. The cold chain manager is responsible for all cold chain equipment repairs on refrigerators, vaccine carriers, and cold boxes. This person is the main contact for questions about the cold chain.

Storing vaccines and using the fridge correctly

- Check the fridge temperature **DAILY** and record it on the FRIDGE TEMPERATURE CHART.
- The layout in the picture above is the best way to organize your fridge.
- **NEVER** let Hepatitis B, DPT or TT vaccines **FREEZE** or come in direct contact with **ICE**.
- Keep vaccines in separate containers in the main compartment of the fridge.
- Stack the vaccines carefully so that air can move between the boxes.
- Keep the diluent (to reconstitute measles and BCG) in the **MAIN** compartment with the vaccine.
- Freeze ice packs in the **FREEZER** only two at a time so that you do not exceed the cooling power of the fridge.
- Only open the door when you need to get refrigerated medicines and vaccines out (opening the door lets the **HOT** air in).
- **NEVER** keep food in the fridge. Food makes the temperature of the fridge uneven, which can damage vaccines.

- **NEVER** keep **EXPIRED** vaccines or **PARTLY USED** BCG and measles vaccines.
- Dispose of properly.
- All vials of opened BCG and measles vaccines **MUST** be discarded at the end of the day or six hours after diluent has been added, even if they are kept at a sustained temperature of +2^{o}C to +8^{o}C.

4.3.7. Use of cold box and a vaccine carrier

Vaccine carriers and cold boxes have thick walls and lids. They are **insulated.**
This means that they are made of special material which does not allow heat to pass through it. An insulated container cannot **keep** vaccines or ice packs cold, but only a refrigerator can **make** them cold.

Cold Boxes
Cold boxes usually have a cold life of two to seven days**.**

Cold boxes are used to transport vaccines from the Expanded Vaccination Program store all the way to the health facility, and from the facility to the immunization sites.

Vaccine Carriers
Vaccine carriers are smaller than cold boxes. They can keep vaccines cold for only 48-72 hours (1-3 days), and only if used carefully.

Vaccine carriers are used to:

- Take vaccines to outreach sites and for temporary storage during health centre immunization sessions.
- Transport vaccine easily by motorbike or walking.
- Temporarily store vaccines to be used during immunization sessions.
- Store vaccines for a short time while defrosting the fridge, or when the fridge breaks down.

Note: When an order is placed, the RMS branch must inform health facilities when it will be delivered. Vaccines should not be kept in cold boxes for a long time and should be placed in a fridge upon receipt.

4.3.8. Temperature monitors

Temperature monitors are used to show when a fridge, icebox, or vaccine carrier has reached a temperature too warm or too cold for safe storage of vaccines.

Thermometer and Chart

The main way to monitor the fridge temperature is to use a fridge thermometer and temperature record chart.

The fridge thermometer is designed to read temperatures above and below zero the temperature is recorded by looking where the silver or red line has risen.

Some fridges have a digital thermometer which displays the temperature in numbers.

The fridge temperature should be checked **twice daily** to make sure it is correct. These temperatures should be recorded on a Fridge Temperature Record Chart. This chart acts as a record of the fridge temperature and can be used to tell if there are problems with the fridge. A sample chart appears at the back of this manual.

The facility should keep a record of its completed monthly temperature record chart to show supervisors that the fridge has been working properly over many months. If the temperature deviates from the normal range, this should be reported to the upper level and appropriate measures should be immediately taken.

4.3.9. Stock rotation and expiry monitoring

FEFO (First to Expire = First Out!)

FEFO means that the medicines with earliest expiry date are distributed first, regardless of the order in which they are received. When the order is unpacked, the stock with a long shelf life should be placed in the back and stock with the earliest expiry date should be moved to the front. This is called "stock rotation. This is most advisable to use for medicines.

FIFO (First In = First Out!)

FIFO means that you use the medicines that have been in your facility the longest first. If your medicines have the same expiry date or you have medical sundries with no expiry date, then you should use the item that has been in your facility the longest first. It is advisable not to use medicines without expiration dates. FIFO is not popular with Pharmaceuticals but can be for some medical equipment and consumables.

4.3.10. Summary of good storage practices

1. Clean and disinfect storeroom regularly.
2. Store supplies in a dry, well lit, well ventilated storeroom out of direct sunlight.
3. Secure storeroom from water penetration.
4. Ensure that fire safety equipment is available and accessible, and personnel are trained to use it.
5. Store condoms and other latex products away from electric motors and fluorescent lights.
6. Maintain cold storage, including a cold chain, for commodities that require it.
7. Keep narcotics and other controlled substances in a locked place.
8. Store flammable products separately from other products. Take appropriate safety precautions.
9. Stack cartons at least 10 cm (4 in) off the floor, 30 cm (1 ft) away from the walls and other stacks, and not more than 2.5 m (8 ft) high.
10. Store medical supplies away from insecticides, chemicals, old files, office supplies, and other materials.
11. Arrange cartons so that arrows point up. Ensure that identification labels, expiry dates, and manufacturing dates are clearly visible.
12. Store supplies in a manner accessible for FEFO, counting, and general management.
13. Separate and routinely dispose of damaged or expired products.

Note: Narcotics and psychotropic medicines and other controlled medicines must be stored in a double-locked cupboard as required by law N°03/2012 of 15/02/2012 governing narcotic drugs, psychotropic substances, and precursors in Rwanda.

4.4. Inventory controls

4.4.1. Assessing stock status

Assessing stock status is a management function primarily to guide decisions related to resupply. Stock status assessments should be conducted regularly at least monthly to avoid stockouts. Stock status should also always be assessed during quantification exercise.

The importance of assessing stock status:
Being able to determine how long the stock will last will tell if supplies are running too low or if the stock might expire before use. It helps also to know the stock value in terms of money or whether the facility is overstocked.

4.4.2. How to assess stock status

Stock status is knowing how long your stock will last. It is calculated by dividing stock on hand by average monthly consumption.

Stock on hand (SOH)
SOH is the quantity of usable stock at the facility. (Items that are unusable are not considered as part of stock on hand.) SOH is obtained from store cards or from eLMIS after running a physical count.

Stock position is the sum of stock on the hand (working and safety stock) and stock on order, minus any stock back-ordered to clients. Overstocks may occur if several months' worth of stock are on hand or on order when a new order is placed.

Average monthly consumption (AMC)
AMC is the amount of stock used on average in one month. The quantity of medicines used over time must be known to calculate this. AMC can be calculated by using your stock card or eLMIS. The best way to calculate your AMC is to use information on stock given to the patients (consumption data). To calculate the AMC, first calculate a simple average by finding the sum of a set of monthly consumption, and then divide by the number of months used. This information can be found from:

- the daily consumption registers
- eLMIS
- tick sheets
- patient registers
- stock cards

Because AMC can change over time, it is important to derive an average from the last three to six months, and AMC should be checked about every six months for changes.

Safety stock
Safety stock is the stock that should always be on hand to prevent stockouts. When lead times and consumption are predictable and stable, the reorder level does not necessarily need to include safety stock, however, when consumption patterns and lead-times are highly variable, additional stock will be needed. **SS= Lead time x Average Consumption**
Max (maximum stock level)

Max is short for maximum stock level in a Max/Min inventory control system. It represents the highest acceptable stock level needed to satisfy demand until the next order after the current one is received. Any order placed should not exceed the maximum level, which is either 3 or 6 times the AMC (the former for the RMS branch, and latter for the Central level). Maximum stock is calculated as the average monthly consumption multiplied by the procurement period or resupply cycle.

Min (minimum stock level)/reorder level

Min is short for minimum stock level. It is the quantity of remaining stock that should trigger a reorder. If the ordering system is working well, stock should not be lower than the min level when the next order arrives. The store manager is responsible for ensuring that stock never goes below the minimum. Min stock is calculated as the average lead time multiplied by the average quantity consumed during the lead time. At the RMS branch level, the minimum is defined as: **AMC x 2 = Min**. At Central level, the minimum is defined as: **AMC X 3=Min**

Minimum and maximum stock-level formula: this formula is often used in scheduled purchasing with set order intervals. Using this approach, one defines a theoretical maximum stock for each item to provide sufficient, but not excessive, stock to last from one order to the next, as well as a minimum stock level or reorder level that determines at what point an order should be placed. Safety stock may be included in the minimum stock level, or an additional quantity may be assigned to protect against variations in demand and supplier performance.

Procurement period is the time from when the first order is placed until when the next regular order will be placed. In any scheduled system, the period might be in the multiples of one month or days/weeks (which needs to be converted to months by dividing number of days per 30.5 days) in a perpetual system. Procurement period for essential medicines is resupply period for program medicines

Months of stock (MOS)

This is the length of time in months that the stock will last. This can be calculated when the AMC and SOH are known. **MOS** is calculated by dividing SOH by AMC.

Emergency order point (EOP)

The EOP is the level at which stock is at high risk of stocking out, necessitating immediate placement of an emergency order. Emergency order point is reached when a stock level reaches a safety stock level. Efforts must be made beyond regular ordering processes to get the products to avoid a stockout. The EOP is calculated as: EOP=0.25 X Min

4.4.3. Physical count

Physical inventory is the process of counting by hand the number of each type of product in the store at a particular given time. The process allows one to check that the stock on hand matches stock keeping records. This is always done at the end of the month. There are two common methods of physical inventory: a complete physical inventory and a cyclic or perpetual physical inventory.

Complete physical inventory: this kind of physical inventory ensures all products are counted at the same time. This is usually done at least once a year in all stores but more frequent inventories (quarterly or monthly) are recommended. A complete physical inventory is easier to conduct regularly at small facilities. Large warehouse may need to close the facility for a day or longer.

Cyclic or perpetual physical inventory: this kind of physical inventory, selected products are counted and checked against the stock keeping records on a rotating or regular basis throughout the

year. This is appropriate at facilities that manage large quantities of products and should be done at least once during the year.

Before doing any kind physical inventory, always check that all the stock is in its correct place, and that it is not expired or damaged. After conducting a physical count, compile a report disclosing some of the inventory information: item description, park size, lot number, quantity, expiry date and the value (see annex). The report should be signed by the team which participated in the inventory before it is approved by management team.

Instructions on conducting a physical inventory

- Check that the stock is in the correct place.
- Clean the shelves to remove dust and insects.
- Check for expired/damaged stock.
- If stock is expired/damaged, remove it from the shelf, write it out on the stock card, and put it in the quarantine zone. (Don't forget to note this on your inventory reporting form too.)
- Any expired/damaged stock and opened containers should NOT be counted.
- Carefully count the number of full current units you have.
- Write this number on the stock card and on your inventory reporting form. (Watch carefully that you count using the SAME units that you use on the stock card, e.g. tablets or bottles of 1000.)

Maintaining the quality of products in storage

Checking for physical damage, cleaning, heat and humidity control, water damage prevention, protection against fire, preventing pests and protection against theft are some of the measures that can be adapted to ensure the quality of products is maintained throughout the entire storage period. The following list describes what to look for to prevent the quality from being compromised.

Type of products	**Indicator to look for**
All products	Broken or ripped packaging Missing, incomplete, or unreadable labels Blackening of the packing, which may indicate fungal growth in the packing material.
Liquids	Discoloration Cloudiness Sediment Broken seal on bottle Cracks in ampoule, bottle, or vial Dampness or moisture in the packaging
Latex products	Dryness Brittleness

	cracks
Lubricated latex products	Sticky packaging Discolored product or lubricant Stained packaging Leakage of the lubricant
Tablets	Discoloration Crumbled pills Missing pills from blister pack Stickiness Unusual smell
Injectables	Liquid that does not return to suspension after being shaken Foreign particles
Sterile products (including IUDs)	Torn or ripped packaging Missing parts Broken or bent parts Moisture inside the packaging Stained packaging
Capsule	Discoloration Stickiness Crushed capsule

4.4.4. Management of donations

Often visitors from other countries may have medicines with them that they want to donate to you. These visitors include travelers, foreign workers, church groups, or visiting medical teams. Donations can be useful, but they can also be dangerous or even illegal, and sometimes can cost you money and waste your time.

Problems with donations

Many different types of pharmaceutical donations exist, and each has its own set of specific problems. These are some of the common problems:

- Pharmaceutical donations in emergency situations may not be relevant for the situation, or health workers may not be familiar with the donations or may not be registered in the recipient country and may not comply with local treatment guidelines.
- Pharmaceutical donations between government as part of development aid may interfere with the implementation of national registration procedures, quality assurance, and inspection schemes, as a result may not be in line with promotion of rational medicines use.
- Donations of returned or unwanted pharmaceuticals that doctors may be forced to prescribe to patients, yet the same medicines may not be consistently available.

For ALL donations, use the following guidelines:

- People must have permission from Rwanda Food and Drug Authority or the Ministry of Health BEFORE they donate any health commodities. (Check before accepting)
- ALL donations should be on the Essential Medicines List.
- They should be from a reliable source. (If not sure then don't accept.)
- All medicines should be labeled in English/French with the medicine name, strength, form, batch and expiry, storage conditions and manufacturers name clearly printed. (If you can't read it don't accept it.)

Procedures need to be developed to define needs, prioritize requirements, coordinate donations, decide which supporting documents is needed, establish a criteria for accepting or rejecting donations, arrange for transportation and storage area, agree on who will pay for all the involved costs, agree on how donations are to be valued in budget and expenditure reports, agree on whether to charge or not to charge donations, dealt with donated products not registered in the country, supervise the distribution of donated medicines to prevent them from being diverted for commercial sale, and plan how worthless donations will be disposed.

Note: Donated medicine management may sometimes require a separated room from the general storage room based on donor's requirements. When this is the case, donated medicines will have to be stored apart from general stocks, and separate stock records and reports should be kept.

You DO NOT have to accept all medicine donations.
If they DO NOT comply with the rules, say NO THANK YOU.

4.5. Management of unusable (Expired, damaged and quarantined) pharmaceutical products

Expired and unwanted medicines need to be disposed properly. Disposing of medicines helps ensure the safety of the local people and the environment. Keep expired and unwanted medicines separate from the normal medicine and equipment supplies. Dispose of them properly according to the standard operating procedures.

Tips on how to dispose health commodities:

- Separate each unusable (expired and damaged) medicine from the stock in use immediately after its identification and quarantine it prior to disposal.
- Mark the quarantine zone, by sorting of unusable medicines should be done carefully with respect to national SOPs in place.
- Make a list of all medicines to be disposed. The list must include the following information: the name, strength, form, batch number, expiry date, monetary value of each item on the list, and the quantity for each medicine. The list must be approved by a competent authority at the health facility level. For district hospitals, the board of directors will approve the list; for health centers, the list will be approved by COSA (comité de santé) (reference: law no 50/2008 of 9/9/2008 determining the procedure for disposal of state private assets).
- The disposal process is conducted using the nearest appropriate incinerators. Provide report to competent entities and include the date of activity, disposed volume (kg), and monetary cost.

Table 4: Waste Management Methods

Category	Disposal Methods	Comments
Solids **Semisolids** **Powders**	Landfill Waste encapsulation Waste inertization Medium-and high-temperature incineration	No more than 1% of daily municipal waste should be disposed of in an untreated form in a landfill
Liquids	Sewer High-temperature incineration	Antineoplastic should not be disposed of in the sewer due to the high risk they present to anyone coming into contact with them
Ampoules	Crush ampoules and flush diluted fluid into sewer	Antineoplastic should not be disposed of the sewer due to the present to anyone coming into contact with them.
Anti-infective medicines	Waste encapsulation Waste inertization Medium-and-high-temperature incineration	Liquid antibiotics may be diluted with water, left to stand for several weeks, and discharged to a sewer
Antineoplastic	Return to donor or manufacturer Waste encapsulation Waste inertization High-temperature incineration Chemical decomposition	Not to landfill unless encapsulated Not to sewer No medium-temperature incineration
Controlled medicines	Waste encapsulation Waste inertization Medium-and-high-temperature	Not to landfill unless encapsulated
Aerosol canisters	Landfill Waste encapsulation	Not to be burnt, may explode
Disenchants	To sewer or fast-flowing watercourse: small quantities of diluted disinfectants	No undiluted disinfectants to sewer or watercourses Maximum 50L per day diluted to sewer or fast-flowing watercourse No disinfectants at all to slow-moving or stagnant watercourses
PVC plastic, glass	Landfill	Not for burning in open containers
Paper, cardboard	Recycle, burn, landfill	

Table 5: Inventory management checklist

Record Keeping	Are the inventory records up to date? Check the stock cards to see how recently they have been used?
Stock levels	Are minimum and/or maximum stock levels calculated for each item? Has the average monthly consumption been calculated recently and accurately? Has the store successfully avoided stock outs?
Quality assurance	Is there a system for performing quality checks to make certain that all medicines are of good quality? Are medicines and supplies checked for quality immediately upon arrival and before they are dispensed to patients? Are all reported problems documented? Are all documented problems reported?
Physical inventory	Is a physical inventory conducted at least once a year? Small facility should do this at least once a month or every two-six months.
Ordering	If the facility orders its supplies, are orders placed on time in order to maintain inventories at agreed stock level? Are the quantities to order calculated correctly? Has an ABC and/or VEN analysis been performed?
Reporting	Are reports submitted on time? Are any reports missing in the last six months? Are reports filled out correctly? Is the information in the reports accurate?
Disposal	Is there an annual survey of expired or damaged medicines and supplies, or physical inventory of unusable stock that is set aside? Are damaged or expired products removed and disposed of according to government guidelines?
Materials	Is there an up-to-date supply manual available to staff? Is there an adequate supply of the correct forms for recording stock movements, reporting, and ordering?

4.6. Typical pharmaceutical distribution system

Distribution begins when pharmaceuticals are dispatched by the manufacturers or suppliers and ends with patients. The distribution system includes port-clearing, receipt and inspection, inventory control, storage, requisition of supplies, delivery, dispensing to patients and reporting consumption.

The primary distribution management goal is to maintain a steady supply of pharmaceuticals and supplies to facilities where they are needed while ensuring that resources are used in the most effective way. A good distribution system is a cost-effective system that provides an acceptable level of service.

Effective pharmaceutical distribution relies on good system design and good management. A well-designed and well-managed distribution system should:

- Maintain a constant supply of medicines
- Keep medicines in good condition throughout the distribution process
- Minimize medicine losses caused by spoilage and expiry
- Maintain accurate inventory records
- Rationalize medicine losses caused by spoilage and expiry
- Maintain accurate inventory records
- Rationalize medicine storage points
- Use available transportation resources as efficiently and effectively as possible
- Reduce theft and fraud
- Provide information for forecasting medicine needs
- Incorporate a quality assurance program

A distribution system needs to be able to move medicines from a central warehouse to lower levels of the supply chain. The following considerations should be kept in mind when setting up a distribution system:

- Define appropriate roles in the distribution system
- Design an efficient network of storage facilities with the fewest number of levels appropriate to the country's geography
- Select an appropriate strategy for delivery
- Keep reliable records of medicine stocks and consumption Allocate supplies based on actual workload andt8treatment needs
- Maintain accountability procedures and securet8storage at each level of the system Construct or renovate facilities to be appropriate fort8storing medicines
- Manage storage facilities to maintain pharmaceutical quality and efficiently serve health units
- Make reliable transport arrangements
- Reinforce reporting and supervision arrangements

The importance of distribution

Medicine distribution is a key element of the medicine management cycle, and its primary objective is to ensure the smooth delivery of medicines and medical supplies to the final user, the patient, through different internal services. The process of ensuring **optimal** operation of distribution in the supply chain is also known as **optimization**.

Good distribution practices of health commodities ensure that:

- There is a constant and uninterrupted commodity supply
- Commodities stay in good condition until they are used
- Losses due to spoilage and expiry are minimized
- Theft and fraud are prevented
- Adequate stock is maintained
- Storage locations that allow for on-time delivery are used
- The collection of accurate information for forecasting is enabled (World Bank, 2004)

Push and pull systems

Distribution schemes can be defined by which levels of the system order medicines and which, if any, passively receive medicines distributed from higher levels. The two basic alternatives are:

Pull system: Each level of the system determines what types and quantities of medicines are needed and places orders with the supply source using the information from the recipient level. This type of system is sometimes called an independent demand or requisition system.

Push system: supply sources at some level in the system determine what types and quantities of medicines will be delivered to lower level using the information from the lower (recipient) level.

Allocation is when resupply decision is made at a higher lever to a lower level without using information from that lower level.

Pull system are preferred whenever the capacity exists to manage them effectively. When the capacity does not exist at the lower level but are available at higher level, push system will be preferred. Yet an allocation system can be useful in certain situations, such as disaster relief and when the supply pipeline does not function at all levels of the system.

Other conditions favoring a pull system are:

- Lower-level staff members are competent in assessing needs and managing inventory
- Sufficient supplies are available at supply sources to meet all program needs
- A large range of products is being handled
- Field staff members are regularly supervised, and performance is monitored.
- Good data are available to decision makers

Other conditions favoring a push system

- Lower-level staff members are not competent in inventory control
- A limited number of products is being handled

Conditions that may favor rationing and allocation:

- Disaster relief is needed, or the situation calls for short-term supply through prepacked kits
- Demand greatly exceeds supply, making rationing necessary

Factors that determine distribution frequency

- Storage capacity at each level of the system
- Availability, order size, carrying capacity, and cost of transport
- Seasonal factors that influence transport reliability
- Staffing levels and competence of staff at each level of the system

- Other factors, such as expiration dates, security against pilferage, cash flow, and other locally relevant concerns

Transport

Transport managers should make the best use of available transport through careful route planning and delivery scheduling and should carefully consider private-sector alternatives.

Delivery schedules

- Good planning is needed to ensure that each facility receives supplies regularly and on time.
- When determining delivery schedule consider storage capacity, increased transport costs per unit supplied, efficient vehicle usage and climatic factors.

Things needed for effective distribution management

- Experienced and professional logistics managers
- Reliable management information systems for coordinating the distribution network
- Good communication for pharmaceutical distribution system

Steps to follow in order to transport medicines safely

- Fill voids in cartons with packing material and prevent breakages
- Load vehicles carefully and systematically (first-in/last-out) and save time when unloading
- Secure vehicle doors to prevent losses or theft or physical damage
- Protect supplies from sun or rain to minimize deterioration of pharmaceuticals during transit
- Stay near the vehicle to guard against theft
- Start early in the day and drive with care, especially on hazardous roads and avoid nighttime driving to prevent accidents
- Ensure safe and timely delivery

Techniques for the theft control right from port clearance to transportation

- Containers at the port should be physically secured to reduce both major and petty theft
- Containers should be cleared at the port within the shortest time possible to reduce chances of products being stolen ports where security is weak
- Select products that are likely to be pilfered or be misused and check against its delivery records
- Check packing seals to check if they were not tempered with
- Use portable strongboxes or built-in compartments with padlocks or tamper-proof strings should be used

National distribution

The distribution system in Rwanda begins with products flow from central medical stores to districts. The distribution plays an essential role in the medicines logistics system and consists of moving products down the pipeline from the national central warehouse until they are dispensed to the patients.

Country distribution starts when the goods arrive to the country and are released from customs (port clearing) for delivery to the central warehouse. In Rwanda, products flow through a supply system that consists of a central medical store that carries out procurement, storage and delivery to RMS branches. The national distribution system to supply pharmaceuticals across the country is mostly

active. The central warehouse delivers medicines to RMS branches, which in turn supply health facilities.

At the district level, health facilities place orders at the RMS branch based on their need, and the district distributes ordered products. Medicine orders are placed through the eLMIS.

The "Active Distribution" operational in Rwanda is designed for the upper level that supplies product to lower level be responsible for the cost of transportation. However, the lower takes the cost in emergency requisition scenario. This makes lower level to ensure the right quantity of products are always requested.

Product recalls

Pharmaceutical products found to be defective should be recalled quickly. The quality assurance unit should develop standard procedures for carrying out the recall. Recalls may be classified according to the degree of risk to the consumer when the product is likely to cause serious illness or death, temporary or mild illness, and no adverse clinical effect. Once products are detected to be causing one of these three problems, the quality assurance program should monitor the quality and ensure recalls are done on time.

Inventory management online resources

All online resources are free, and you will need to create an account as some of the links requires to access training. For the UNDP link, register with a non-UNDP email address

https://www.undp-psmtraining.com/course/view.php?id=2&section=5	
https://elearning.jsi.com/mod/scorm/view.php?id=1	Topics 3, 4 and 5
https://www.youtube.com/watch?v=-ZpHiMTwOdM&list=PLCD3E338A3E58E906&index=4	Transportation and Logistics video
https://www.youtube.com/watch?v=kpGLsvjdOiA	Disposal of Waste video
http://supplychainhandbook.jsi.com/wp-content/uploads/2017/01/JSI_Supply_Chain_Manager's_Handbook_Chpt.7_Final.pdf	Inventory strategy
http://supplychainhandbook.jsi.com/wp-content/uploads/2017/01/JSI_Supply_Chain_Manager's_Handbook_Chpt.8_Final.pdf	Warehousing and Distribution
https://www.msh.org/sites/default/files/mds3-jan2014.pdf	
https://www.jsi.com/JSIInternet/Inc/Common/_download_pub.cfm?id=11497&lid=3	

Unit 5: Logistics Management Information System (LMIS)

Objectives

By the end of this chapter participants will be able to:

- Define logistics management information system (LMIS)
- Explain the importance of LMIS
- Explain the six "rights" for logistics data
- Describe the essential data needed for decision making
- Explain the importance of LMIS vs. eLMIS

5.1. Introduction

5.1.1. Logistics management information system

A logistics management information system (LMIS) is the system of records and reports that one uses to collect, organize, and present logistics data gathered across all levels of the system. An effective LMIS enables people involved in health product management to make informed decisions that will ultimately improve medicines availability to patients.

5.1.2. The importance of a logistics management information system

Information is the engine that drives the entire logistics cycle. We collect data for appropriate information to make decisions; the better information we have, the better decisions we can make.

The LMIS can be used to make decisions in a variety of areas, including:

- Quantification
- Procurement
- Inventory management and control at the health facility level Monitoring program performance
- National pipeline monitoring
- Redistribution of health commodities when necessary
- Capturing information on where consumption is highest or lowest, which helps determine whether more resources are required

An effective LMIS for health products will thus contribute to preventing stockouts and stock imbalances of medicines at health facilities. However, it heavily relies on good record- keeping practices of the staff responsible for medicines management at health facilities.

The six "rights" for logistics data

The logistics six "rights," which also apply to data, are the six key elements needed for an effective LMIS. MOH and programs need:

1. the right data (also called the essential data items),
2. at the right time (in time to act),
3. at the right place (the place where the decisions are made), and
4. in the right quantity (having all essential data from all facilities).

The data must be of

5. the right quality (we must believe that the data are complete and accurate) and Right Condition
6. at the right cost (we should not spend more to collect information than we spend on supplies).

5.2. Essential data for decision making

To make supply decisions, three pieces of information are needed:

- **stock on hand:** Quantities of usable stock available at any level or at all levels of the system at a point in time.

- **rate of use (consumption):** The average quantity of commodities dispensed to users in a given time.
- **losses and adjustments:** Losses are the quantity of health commodities removed from the distribution system for any reason **other than** consumption by clients (e.g., losses, expiry, and damage). Adjustments may include receipt or issue of supplies to/from one facility to another at the same level (e.g., a transfer) or a correction for an error in counting. Losses/adjustments may therefore be a negative or positive number.

These are the three MINIMAL and ESSENTIAL data required to manage a logistics system. They must be recorded as well as reported through the LMIS.

5.2.1. types of records

In the supply pipeline, only three activities can happen: supplies are stored, moved (in transit), or consumed (used). Because we want to be able to monitor supplies always in the pipeline, we need three types of records to track the supplies.

1. **Stock keeping records**

These keep information about products in storage (stock on hand, receipts, issues, losses, and adjustments). Anyone who receives or issue stock from storage and takes a physical inventory should complete the stock keeping records. When the stock keeping record is full, a new record should be started using the ending balance from the previous record. Examples are stock cards and store ledgers.

2. **Transaction records**

These keep information about products being moved from one storage to another (requesting, receiving, and reporting form as well as delivery notes). Sometimes, a transaction record will be combined with a type of report and will include data like current stock on hand, and depending on the system design, losses and consumption data. Warehouse personnel or pharmacy personnel or nurses. Examples are 'issued' and 'receipt' vouchers as well as combined requisition.

3. **Consumption records**

These keep information about products being used (consumption data — this can be found, for example, in the Daily Consumption Register, which records the medicines dispensed to patients or end user at a facility). Usually, products are not distributed (dispensed) directly from the storeroom to the customer; therefore, actual consumption data is not collected on a stock keeping record. Issue data is often a substitute for consumption data. Service providers who dispense products to clients or use products at SDPs complete this type of record. Examples are daily activity register, daily usage registers and pharmacy dispensing register

Note: A stock card is an individual stock keeping record that holds information about a single product by lot number or batch number. The card should note the stock on hand, losses and adjustment of a product for that batch number only. An inventory control card is an individual stock keeping record that holds information about all the lots of a single product, it can also be known as a summary of many bin cards for a product. To ensure each lot is managed correctly in large warehouse, it usually advised to maintain both inventory control cards and bin cards. In small storerooms, stock keeping record or stock card or inventory control cards can be used. Apart from these record tools, an electronic logistic management information system (eLMIS) also can be used for recording, moving, and reporting data.

Sample Stock Card

REPUBLIC OF RWANDA

MINISTRY OF HEALTH
P.O. BOX 84, KIGALI

STOCK CARD No.

Maximum Stock:	
Emergency Order Point:	

Province:	
District:	
Facility Name:	

Product Description: (Name, Dosage, Form)	
Unit of Issue:	
Storage Condition:	
Product Code	

Date	Received from/ Issued to	Batch Number	Expiry Date	Received	Issued	Balance	Months of Stock	Observations	Signature
&676>F5!)6DD=5B!+ADḢ6DB									

Monthly Consumption/ Distribution	January	February	March	April	May	June	July	August	September	October	November	December
	--	--	--	--								

5.3. Electronic logistics management information system (eLMIS)

The Ministry of Health has strengthened national supply chain management planning by implementing an electronic logistics management information system (eLMIS) to improve supply chain processes and best standard practices, and to ensure availability of accurate logistic data in a timely manner for informed decision making.

5.3.1. eLMIS functionalities

An eLMIS has various components, with its users' roles and responsibilities assigned depending on health care levels. These components are order management, inventory management, transportation, warehouse management, price configuration, and replenishment planning.

5.3.2. Importance of recording and reporting through an eLMIS

Rwanda is benefiting from the use of an eLMIS to collect and use more complete and accurate data which allows for a timely decision-making process.

The advantages of using an electronic version over a paper-based system include reducing stockouts, managing waste and losses, and operating an effective and efficient supply chain. In addition, preparing a summary and feedback report is easier and less time consuming when the LMIS is automated. An eLMIS application can automatically populate report elements, especially if the system is also used for routine inventory control, and for opening balance, receipts, consumption, losses, or adjustments that are recorded with every transaction.

With the click of a button, the eLMIS can generate a summary report and a requisition order with suggested replenishment quantities. The eLMIS can also streamline and customize a feedback report by generating and transmitting notifications, reminders, and alerts.

A notification might be a short message to a manager to log in, review, and approve a requisition, or to a health care worker that a consignment is ready for pick up or delivery.

A reminder can help personnel to attend to routine activities, such as conducting physical inventory at the end of the month and submitting their requisition orders.

An alert flags a problem, such as a product that has limited shelf life remaining, or an impending stockout.

An eLMIS can also enable routine reporting to other stakeholders, programs, and divisions within the Ministry of Health and development partners.

Likewise, an eLMIS enables analysis of supply chain performance by displaying dashboards that are specific to each user and role within the system. At higher levels, these dashboards can help supply chain managers see the big picture based on key performance indicators, and to drill down into specific indicators.

Finally, an eLMIS can be integrated into the broader supply chain and health information systems to enable deeper analysis, better workflows, and greater visibility across health domains. An eLMIS can be linked with electronic medical records and other eHealth systems.

An LMIS is at the heart of key decisions making in the supply chain. It is therefore important that:

- Health center (HC) and hospital health supply chain staff review their data before entering it in the eLMIS.
- Both HC and hospital health supply chain staff enter data into the eLMIS on a regular basis.

5.3.3. Data interpretation steps

- Check if the data is correct by reviewing if calculations were done correctly by working closely with data validation committee
- Check if the data is representative by ensuring that aggregation and analysis of data is based on a representative sample of data to ensure that a majority of units are reporting on time.
- Check if any of the figures seem high or low Compare the figures with previous figures Compare figures for different geographic areas
- Check what might be the cause of differences identified in the reports (check if seasonal variations and economic problems were responsible for the difference or not)
- Act after interpretation by discussing reports with colleagues, provide feedback and work together to agree on possible actions.
- Gather more data to correct the problem

LMIS online resources

All online resources are free, and you will need to create an account as some of the links requires to access training.

https://elearning.jsi.com/mod/scorm/view.php?id=1	Topic 2
https://www.youtube.com/watch?v=SXDvHgjRNDQ&list=PLCD3E338A3E58E906&index=12	IT Systems video
http://supplychainhandbook.jsi.com/wp-content/uploads/2017/01/JSI_Supply_Chain_Manager's_Handbook_Chpt.3_Final.pdf	
https://www.msh.org/sites/default/files/mds3-jan2014.pdf	
https://www.jsi.com/JSIInternet/Inc/Common/_download_pub.cfm?id=11497&lid=3	

Unit 6: Monitoring & Evaluation and Supervision

Objectives

By the end of this chapter participants will be able to:

- Define monitoring and evaluation (M&E) and supervision
- Describe the purpose of M&E and supervision
- Describe the process of M&E and supervision and related tools
- Describe how to solve problems systematically throughout M&E and supervision findings

6.1. Introduction

Monitoring is the systematic collection and analysis of information as a project progress. It is a planned, systematic process of observation that closely follows a course of activities and compares what is happening with what is expected to happen.

Evaluation is the comparison of actual project impacts against the agreed strategic plans. It looks at what you set out to do, what you have accomplished, and how you accomplished it. The process assesses an achievement against present criteria. The process of evaluation follows distinct methodologies (process, outcome, performance, etc).

Supervision in this context is defined as the way of supporting often health care workers and ensuring the quality of the health services they provide, for example by introducing interventions to improve performance. However, supervisory visits require time and transport and can be relatively costly. Supervision plays a critical role in effecting change both at the facility and within the health care system.

The purpose of monitoring and evaluation (M&E) and supervision

M&E shows whether a service/program is accomplishing its goals. It identifies program weaknesses and strengths, areas of the program that need revision, and areas of the program that meet or exceed expectations. It also helps to document lessons learnt and qualitative narratives supporting documented quantitative progress

Monitoring helps identify shortcomings and provides guidance to modifying original plans during implementation. It also provides elements of analysis as to why progress fell short or above expectations.

Evaluation attempts to measure service's relevance, efficiency, and effectiveness. It measures whether and to what extent the program's inputs and services are improving the quality of people's lives. It aims to determine the extent to which service needs and results have been or are being achieved and analyses the reasons for any discrepancy.

The process of monitoring and evaluation allows one to:

- Review progress to determine whether activities are being carried out as planned
- Measure achievement of short-term targets
- Identify problems in planning and/or implementation to initiate corrective action Identify and reinforce good performance and strengthen weak performance to improve project or organizational efficiency, effectiveness, and impact;
- Keep the work on track and let management know when things are going wrong. If done properly, it will help the team tackle problematic areas early.
- Assess whether activities are having their expected effects

In the context the medicines supply chain, logistics monitoring is essential to inform managers on how logistics operations are impacting service delivery; for example, if they are providing enough, not enough or too much medicines, or whether the management of the supply chain effectively contributes to the achievement of health care system goals.

Data collected through continuous monitoring and measurement can be used to improve logistics systems to be more cost effective, have a greater impact on service quality and utilization, and to adequately support all other activities aiming to achieve program goals.

Using the monitoring system to improve performance

A monitoring system gives managers a way to identify potential problems with program and staff performance and to improve performance. A formalized monitoring system facilitates the development of improvement plans and performance targets, all of which must be clearly communicated at all levels of the pharmaceutical management system. For the monitoring system to be useful, managers should review and share the results regularly and take timely action to follow up. The ongoing monitoring activities will determine if follow-up actions achieved the desired results.

Five types of actions a manager can take to reach desired results are:

- Provide positive feedback to high-performing units or staff to encourage continued good performance
- Provide corrective feedback to staff or units that have not met expectations, but that should be able to take specific steps to improve their performance; many problems can be corrected through supervision and retraining.
- Reallocate resources or reassign staff to achieve a better fit between the task to be accomplished and the resources or staff available
- Make plans and targets more realistic based on actual experience
- Request additional information to further define a specific performance problem and the reasons for the problem

Supervision

Regular supportive supervision by knowledgeable staff is key to ensuring that data used to assess whether the right medicines are available in the right quantities and at the right places are reliable and accurate.

Supervision allows the DP (RMS branch) and central level to check that:

- Patients get the health commodities needed when they need them;
- Planned logistics activities are carried out according to schedule;
- Records are correctly maintained, and reports submitted in a timely manner for re- supply and decision making;
- Qualified health professionals are in place and performing supply chain activities;
- Pharmaceuticals management activities are performed according to the norms and guidelines.

6.2. Conducting monitoring and evaluation (M&E) and supervision

Monitoring can be conducted using various methods

- Supervisory visit, which consists of overseeing and providing direction, guidance, and instruction
- Routine reporting of data, using a management information system
- Sentinel sites — for more detailed reporting and monitoring of developing situations, most passive surveillance systems receive data from as many health workers or health facilities as possible. This is called a sentinel system.
- Special studies to gather additional information or to resolve problems in the health facility by conducting investigative studies to analyze the root causes of the problems that could not be highlighted in the reports generated based on the other three methods

Evaluation can be conducted using three methods

1. Needs assessment (situation analysis)
2. Formative evaluation (midterm review)
3. Summative evaluation (final evaluation)

These three methods can be used in self-assessment, limited assessment, and structured assessment. The choice of assessment approach depends on available financial and human resources, timing, sponsorship, and intended uses of the results. Evaluation can be conducted through five phases; planning for evaluation, selecting appropriate evaluation methods, collecting and analyzing information, reporting findings and implementing evaluation recommendations

M&E is part of "**Quality Assurance" as it contributes to the continuous improvement of quality.** Because information is so important in the medicines supply system, it is necessary to monitor that all required information is available on a regular basis.

Methods of supervision

Supervisee self-report: The report is prepared and reported by the supervise with no much efforts of the supervisor.
Observation supervision: The report is prepared fully by the supervisor.
Co-therapy: The report is prepared with the effort of the supervisor and the supervisee.

6.3. Using indicators for monitoring and evaluation

Indicators are variables that measure change in performance of particular supply chain activities or the overall supply chain system. They may be numerical and can be expressed in terms of numbers, percentages, or averages. They may also be expressed as binomials such as yes or no.

Performance indicators are applied in:

- Monitoring of the workplans implementation
- Evaluating achievement of long-term goals
- Assessing the performance of individual units
- Identifying relative strength and weakness in current policies and systems

- Measuring the effect of new policies or management systems
- Self-monitoring to improve performance
- Demonstrating needs to treasury, donors, or other funders
- Reporting on progress to senior officials, donors, or other interested parties

Characteristics of good performance indicators

Logistics performance can be tracked in a variety of ways; regardless of the method used, it is important to focus on indicators that have the following characteristics:

- Measurable (quantitative): rates, proportions, percentage, common denominator (e.g. population), or "yes/no" response
- Motivates "correct" behavior
- Defined mutually by the parties concerned (including health facilities staff)
- Multi-dimensional: balance among quality, utilization, and performance!
- Benefits of the measure outweigh the costs of collection and analysis!
- Clear: easily understandable by everybody**!**
- Useful: represent all the important dimensions of performance
- Measurable easy to measure quantitatively
- Reliable: can be collected consistently by different data collectors
- Valid: measure what we mean to measure**!**

6.4. Some common pitfalls in monitoring and evaluation

- Failure to identify the basic questions that are clear and easy to be answered
- Over-ambitiousness in collecting information such as collecting more information with less accuracy, yet the team has less time to analyze the information and give timely feedback
- Complexity due to using cumbersome systems that have often been designed from top down with insufficient testing and input from staff involved in generating and using monitoring information
- Lack of integration with planning and implementation
- Failure to build on existing systems
- Inadequate resource for both monitoring and evaluation
- Lack of objectivity into assessing process
- Jumping to wrong conclusions without crosschecking of the findings
- Lack of comparison (baseline) data against which findings can be compared to know if the apparent changes are real and are as a result of the effort put in during implementation.
- Failure to develop a monitoring and evaluation plan with defined times

Monitoring and Evaluation online resources

Al online resources are free, and you will need to create an account as some of the links requires to access training.

https://elearning.jsi.com/course/index.php	
https://elearning.jsi.com/enrol/index.php?id=6	
https://www.globalhealthlearning.org/program/monitoring-and-evaluation	
https://www.youtube.com/watch?v=R4HPYYR5iLw&list=PLCD3E338A3E58E906&in dex=10	Measuring performance video
http://supplychainhandbook.jsi.com/wp-content/uploads/2017/01/JSI_Supply_Chain_Manager's_Handbook_Chpt.9_Final.pdf	Performance Management
https://www.msh.org/sites/default/files/mds3-jan2014.pdf	
https://www.jsi.com/JSIInternet/Inc/Common/_download_pub.cfm?id=11497&lid=3	

Unit 7: Resource Management

Objectives

By the end of this chapter, participants will be able to:

- Understand the process involved in financial management
- Describe the process of tracking commodity financial flows
- Explain a typical process of financial management stepwise
- Understand supply chain costing method and its importance
- Describe the process of economic evaluation of health products and technologies in public health supply chain management

7.1. Introduction

Resource management is the process by which businesses manage their various resources effectively. Those resources can be intangible (people and time) and tangible (equipment, materials and finances).
It involves planning so that the right resources are assigned to the right tasks. Managing resources involves schedules and budgets for people, projects, equipment, and supplies

With limited public financial and human resources allocated to pharmaceutical supply management, managers are responsible for ensuring that both resources are used in the best way possible, with the goal of achieving health care objectives. To achieve good financial management, managers must be able to:

- Prepare long-range plans to project the need for services, devise the most cost- effective way of providing them, outline the amount of money needed, and help secure government and donor funding.
- Prepare and communicate program policies and procedures
- Set sales prices that are affordable, competitive, and meet program cost-sharing goals Prepare and use budgets to plan and monitor expenses
- Prepare cash flow forecast to ensure the availability of cash to cover anticipated financial obligations
- Analyzes costs to assess cost-effectiveness and monitor efficient Control and manage the collection, safekeeping, and spending of funds
- Keep proper accounting records and prepare reports for management, government, and donors

7.2. Financial management

In recent years, many governments have begun to follow the private-sector principle of demonstrating “value for money” through the effective and efficient use of resources. In addition, a changing public-sector environment, featuring health care reforms such as decentralized responsibilities and autonomous management, greatly affects how a country carries out its health sector financial management. When possible, an accrual (which recognizes receivables and payables without a cash exchange) basis should always be used. However, if a cash basis must be used because of government rules, elements of an accrual system should be used to complement the government accounting figures and provide more complete information. In order to track pharmaceutical transaction on an accrual basis, accounts should be opened for stock, accounts payable, and accounts receivable.

Process	Description
Financial Planning • Budgeting • Setting targets for monitoring and evaluation	Assessing the current resource position, linking resources to service plans and determining a budget. • Drawing up a budget which will guide how money is spent in order to achieve the goals set. • Setting targets for revenue and expenditure. • Setting targets for efficiency and equity.
Resource allocation	Allocating resources across district services.
In-year management: Operating, monitoring, safeguarding	• Ensuring that funds are spent and revenue collected according to the financial plan and according to the norms and standards set by the Treasury. • Making sure that there are good internal control measures and monitor that these are applied.
Evaluation: Reviewing and reporting	• Linking expenditures to service outputs and analysing with respect to equity, efficiency and sustainability. • Drawing up an annual report. • Identifying key strategic issues for the next District Health Plan.

7.3. What supply chain managers need to know

Supply chain manager needs to know the following about financing-:

- Cost of the health care products that are required by the health care system
- Source of funding for these products and the extent to which commitments are sufficient to meet requirements in the short and long term
- Cost of the supply chain operations to deliver those products to the last mile.
- Cost can be thought of as operating costs to procure, store, distribute and manage the products, capital cost, and advisory cost
- Strategy and plan for efficiently meeting the costs to operate and strengthen the supply chain

7.4. Tracking commodity financial flows

Adequate funding for essential health commodities is to ensure that patients have access to health services they need and deserve. Tracking commodity financial flows involves seven steps which are:

Step 1: **Defining financial tracing objectives** involves monitoring funding, analyze funding by main sources and uses, comparing funding over time, advocating for more funding to overcome funding bottlenecks, ensuring funders meet commitments, gauging the success of commodity security efforts, facilitate procurement decision making, improving transparency, anticipating funding gaps, and responding more effectively to spending surveys.

Step 2: Developing a tracking team and steering committee to effectively track finances. This team should have people who are familiar with government accounting mechanisms, have in- depth knowledge about the national health system and health policies, specific knowledge about the national health system and health policies, specific knowledge about actors in the specific health program, experience with advocacy and the likes.

Step 3: Mapping the commodity financing players. Once the tracking team is formed and the list of commodities to track agreed upon, the team should identify the financing schemes, financial agents and financing sources for commodities that make up the health commodity financing system.

Step 4: Determining data analysis
In general, information needed will include funding needs, commitments, and spending for commodity procurement. While entities within the financing system operate on different fiscal years, the recommended approach is to select a single year of analysis and then convert all the information to that year. Because government funding is usually the focus, the logical choice is to use the government's fiscal year as the unit of analysis.

Step 5: **Analyze data** to know the amount of funding requirements commitments and spending in a variety of ways in support of your defined objectives. For example, the analysis can be done in terms of commitment as percentage of need, comparison of requirements, commitments and spending, spending as a percentage of need, total commitments, and commitment by source, and public share of spending on health commodities for the government scheme.

Step 6: **Mapping the funding process to understand the financing processes and flows.** This will help the team to track and influence spending more effectively. For each funding source, the team can map funding processes, including the timing and decision makers for each step then identify advocacy entry point for mobilizing funds for procuring health commodities.

Step 7: Use the tracking information for decision making and advocacy. The financial tracking information provides the evidence to strengthen decision making and advocacy. Advocacy with in-country stakeholders is often an under-valued activity. However, it is critical in monitoring and mobilizing more funds and ensure accountability. Information gained from tracking can also be used for ensuring funds are converted to commodities, identify and follow up on bottlenecks including delaying procurements, determining quantification timeline, ensuring spending and gauging success.

7.5. Typical financing process steps

1. Identify commodity financing needs
2. Develop budget requests
3. Negotiate request
4. Match request against needs/balance budget
5. Finalize budget
6. Officially allocate or obligate funds
7. Release funds for use
8, Disburse funds for procurement of commodities
9. Procure commodities

7.6. Budgeting

Budgeting process begins early because it takes time for budgets to be approved. This is because all the resources indicated in the budget should be obtained and that process takes long to be ascertained. Two types of budgets are operating budget and capital budget.

Operating budget covers the cost of all items consumed during the year, including salaries, allowances, medicines, transport, travel, postage, telephone, office supplies, heat, electricity, water, and office rent. Any donated items such as medicines or office supplies should be shown and identified in relation to a specific funding source. When assets are to be replaced from sales revenue, depreciation should be included here as an expense.

Capital budget must show all land and buildings to be bought or built, as well as vehicles and equipment to be purchased. All assets that have a long life (more than a year) or a significant value should be included. The definitions of life and value should be in accordance with government regulations or with current accounting standards, if not, covered by regulations. A donated item, such as a vehicle, should be shown in the capital budget and identified in relation to a specific funding source.

Budgeting Method

All budgets should be prepared according to needs, the amounts approved should follow a historical year's budget and adjusted by a percentage to reflect the expected change in funding. This should be achieved by identifying, quantifying and costing resources needed then determine the level of available funds and finally adjust expenditures to the expected level of funds.

7.7. Supply Chain Costing

Essential health commodities are key to improving health outcomes in developing countries, and strong supply chain play a critical role in protecting commodity investment and ensuring these commodities are available where a when users need them. Yet the true costs to optimally operate the supply chain are often overlooked or unknown. Understanding these costs helps managers identify sources and mobilize resources and drive performance improvement decisions. Examples of supply chain costing include costs for storage space, staff involved in supply chain, transportation costs, warehousing costs, information systems and tools, management and overhead.

7.7.1. The importance of supply chain costing

Knowing the total cost of the system as well as its components provides useful information to assist governments and partners in meeting the financial requirements of operating and strengthening a country's supply chain. A supply chain costing exercise helps decision makers understand these costs and use the results of the study to advocate and plan for funding, provide for better planning and management system designs, inform decision making on supply chain policies and financing, provide a clear understanding of funding sources for the supply chain, procurement, transportation, storage, and management.

7.7.2. Supply chain costing methodology

The process of costing the supply chain includes four main steps: planning, data collection, data analysis, and reporting results. Data collection can be challenged by how readily available the information is, and this must be taken into consideration

7.8. Economic Evaluation

Once the supply chain cost data collection is complete, economic evaluation guides decision makers to make informed choices about the best way to strengthen and improve the performance of public health supply chains. Economic evaluation compares the costs and consequences of alternative courses of action as a way to guide decisions about the efficient use of scarce resources.

Economic evaluation includes two broad categories of analysis i.e. cost-effectiveness analysis and cost-benefit analysis, sometimes referred to as return on investment analysis. A cost- effectiveness analysis related the costs of different approaches to a common measure of supply chain effectiveness, such as stock status, order fill rate, or a composite performance measure. Whereas cost-benefit analysis measures costs and consequences of alternative approaches but in monetary terms. The benefits can include savings to the supply chain that result from better system performance due to lower drug costs when inventory is reduces, fewer expired or spoiled products, lower transportation and labor cost.

7.9. Human resources management

Human resources are central to planning, managing, and delivering health services, including pharmaceutical services. In many countries, personnel account for a high proportion of the national budget for the health sector, often more than 75%. In addition to staffing shortages, the health system faces many human resources challenges, including human resources planning, recruitment, deployment, training, staff motivation and staff development. The root causes of these issues can be traced to years of neglect, low salaries, poor workplace climate, and limited capacity to train and update staff skills.

7.9.1. Human resource crisis interventions

Interventions needed to alleviate the human resources crisis include short-terms actions, such as task shifting, while in the long term, countries need to expand their capacity to train enough staff to fill needs. Some issues need to be addressed at the national level (for example, compensation) but many can be addresses through better leadership and human resource management at the facility level. In pharmaceutical sector, the goal is to develop and sustain adequate supply of skilled professionals who are motivated to provide a high level of pharmaceutical care.

7.9.2. Effective ways towards addressing human resource challenges

- Improved leadership and management at all levels
- Recruitment of the right skilled human resources who meet the desired expectations
- Good relationships between leaders/managers and their human resource
- Collaboration between human resource and their supervisors
- Motivate human resource by giving effective supervision, treating them fairly, describe their roles and responsibilities clear
- Create working environment that makes them feel valued and appreciated

7.9.3. Things that strengthen human resource management system

- Employees understanding their work and how that contribute to the mission and goals of the organization
- Employee viewing performance appraisals as an opportunity to learn about their skills and competencies
- The supervisor's role is valued and supported by the organization
- Job descriptions are up-to-date and readily available to all employees
- Employees are routinely considered for job vacancies and other opportunities for promotion
- Employees understand the organization's policies on salaries and benefits and consider them fair and equitable
- Organization engages in long-term planning towards human resource development Improving staff motivation and performance through better human resources practices

7.10. Managing supervisee through supervision

The supervisory activities comprise assessing the comprehensiveness of the implementation, identifying challenges, and proposing solutions without delaying the implementation process. The supervisory teams comprise representatives or those in charge of the CHW activities at all the health system levels (district hospitals, district pharmacies, health centers), including the directorate of maternal and child health, MOH planning and budgeting, HMIS, the MOH health financing unit, and chief accountants in the MOH.

During supervision, the data quality is assessed using a three-step process:

- **Records and forms check:** Which LMIS records and forms are being used?
- **Records and forms review:** Are the records and forms properly maintained and kept up to date?
- **Cross check for data consistency within facilities:** Are the records within this facility consistent with one another? That is, do shipping/receiving records match stock cards? Do stock records match a physical inventory taken at the time of the assessment for some tracer commodities?

This involves checking data consistency:

- between inventory record and physical inventory (balance on hand)
- between inventory record and daily activity register (quantity dispensed to consumers)
- between daily activity register and stock report (quantity dispensed to consumers)
- between inventory record and delivery notes and invoice (quantity received)
- between quantity ordered and quantity received

7.10.1. Examples of tools used during supervision of the health supply chain

Currently the following tools exist for supervising and evaluating the supply chain:

- Integrated supervision checklist, which includes some indicators relevant to inventory management and medical products and technologies storage conditions
- DHMT Supervision Checklist
- Quality Management Improvement Approach (QMIA) checklist

Resources Management online resources

https://www.youtube.com/watch?v=kS-5QXSc3Hc	Why invest in Supply Chains video
https://www.youtube.com/watch?v=ohrm-PGLydg	Supportive supervision video
http://supplychainhandbook.jsi.com/wp-content/uploads/2017/01/JSI_Supply_Chain_Manager's_Handbook_Chpt.10_Final.pdf	Organization and capacity Workforce

Unit 8: Communication, Leadership and Change Management

Objectives

By the end of this chapter, participants will be able to:

- Describe the role of communication in leadership and change management
- Describe different communication methods available for use
- Explain feedback and its importance in communication
- Describe things that affect good communication
- Define leadership and management
- Explain different types of leaderships
- Describe process of problem solving
- Explain the process of change management

8.1. Introduction

Communication is the way people share their ideas, information, opinions, and feelings with others directly or indirectly. Communication is very important and should be done well so that leaders are able to effectively inform their subordinates and collaborate well to reach the intended goals and objectives. Change management is inevitable too without effective communication between the leader and change agents.

8.1.1 Communication methods

Communication can be:

- Face-to-face with verbal and non-verbal messages, e.g. to a patient at the dispensary window, to health workers on the wards and fellow staff.
- Verbal only (non-face to face), e.g. over the telephone or on the radio.
- Written, e.g. letters, memos, faxes, and e-mails
- Good communication requires skills in listening, understanding the messages and giving feedback to the one sending a message because for communication to work well, it must be a two-way process.

Feedback

Feedback is getting information from the person receiving the message to find out whether the message was understood. Feedback helps the communicator to see if enough information has been given, and it allows the communicator to give clarity where there is ambiguity.

8.1.2 Things that affect communication

People

We each have thoughts and things that happened in our lives that make us different from others. The more shared experiences you have with others, the easier it is to communicate with them.

Not everyone sees or hears things in the same way. While communicating, think about the needs and experience of the receiver.

Needs

We all have the same basic human needs of survival, making friends, and feeling good about ourselves, and we like to be part of making things. Individual needs are different from one person to the other and from one situation to the next. This affects communication because one may understand or misunderstand a message depending on his/her needs at the time. For example, if a person is feeling pain then he/she may not feel like spending time with people.

Background

The way we are brought up, our culture, and what village we come from affects our needs, values, and expectations.

Education

How much and what type of education we have affects the way we think and understand life. For example, peoples understanding of their body and health' – where people have not had the education to understand how their body works and how medicines work then they will need more support and explanation to ensure they follow instructions and understand why

Language

The way we speak and the words we understand, and use affect our communication. If English is not a first language, then it is harder to understand it.

Interests

Whether we like reading books, listening to music, playing outdoor activities, sports, or staying at home affects how we think about things.

Occupation

Our jobs lead us to have different ideas and outlooks.

Personality

Whether we are energetic, quiet, mix well with people, shy, secure, or scared, these all affect the way we communicate.

Race

Our nationality or the village we come from affects the way we see and respond to the world.

Age

People of different ages have different interests, thoughts, and needs. You would probably speak to an old person in a different way than you would to a person of your own age.! Therefore, be aware that these things can affect the way we communicate with other people. It will help you to communicate better with them.

Attitude

Our attitude to those we communicate to will affect our communication with them. It is very important to respect the person you are communicating with.

Body language

What you say with your body can say more than your words. The impressions you send is very important. Avoid sign language as much as possible because the meaning of sign may differ by race and age

Appearance

Appearance leads others to form “first impressions" about us. Their first thoughts about our appearance can influence what they think about us as a person or a health care worker.

8.2. Leadership

Good leadership is exhibited when health facilities can provide services to the community in an appropriate, efficient, equitable, and sustainable manner. A leader is anyone who is trying to close the gap between the way something is and the way it could be.

A leader is anyone who is trying to close the gap between the way something is and the way it could be.

8.2.1 Leadership styles

Autocratic, transactional, democratic, transformational and Laissez-faire are the different leadership styles.

- **Autocratic leadership** also known as authoritarian leadership, is a leadership style characterized by individual control over all decisions and little input from group members. Autocratic leaders typically make choices based on their ideas and judgments and rarely accept advice from followers. Autocratic leadership involves absolute, authoritarian control over a group.

- **Democratic or participatory leadership** allow the team to give input but still make the final decisions. This type of leadership guide rather than direct and help team members feel valued and develop their skills in the process.

- **Transformational leadership** is a leadership style in which leaders encourage, inspire and motivate employees to innovate and create change that will help grow and shape the future success of the company. This is accomplished by setting an example at the executive level through a strong sense of corporate culture, employee ownership and independence in the workplace

- **Transactional leadership,** also known as **managerial leadership** focus on supervision, organization, and performance. It is a style of leadership in which leaders promote compliance by followers through rewards and punishments.

- **Laissez-faire leadership,** also known as **delegative leadership**, is a type leadership in which leaders are hands-off and allow group members to make the decisions.

8.2.2 Good Leadership Traits

Effective leadership maybe looked at from the perspective of an effective leader who has the following traits:

1. Dominance

Effective leaders take charge but are not overly bossy nor do they use bullying style of administration.

2.High energy

They are optimistic, positive and have high stamina which shapes their decision to lead.

3.Self confidence

On a continuum from strong to weak they are self-assured in their judgment, decision making, ideas and capabilities.

4.Locus of control

They are internalizers and believe that they control their fate and that their behavior directly affects performance of their organization.

5.Stability

They are emotionally in control of themselves and don't let their anger have negative outcomes.

6.Integrity

They are honest, ethical and trustworthy which is essential in running a successful business.

7.Intelligence (general mental ability)

They have a cognitive ability to think critically solve problems and make decisions.

8.Flexibility

They can adjust to different situations.

9.Sensitivity to others

They understand group members as individuals, what their position on issues are and how best to communicate with and influence them.

8.2.3 Other Good Leadership traits

- **Time management** is very important in leadership and change management because once time is wasted it can never be regained.

Leaders need to analyse how they spend their time and learn on how to save time effectively. Unanticipated interruptions, procrastinating, making unrealistic, time estimates, unnecessary errors that would require one to do things over again, poor organization, micromanaging or failure to delegate responsibilities, doing urgent other than important tasks, poor planning and lack of contingency plans, and lack of policies and standard operating procedures are some of the examples of time wasters.

To manage time well, leaders need to make decisions timely, concentrate in doing one task at a time, establish daily to short-term to log-term priorities, establish deadlines, maintaining accurate calendars, know when to stop a task, use checklists or to-do lists, and adjust time according to priorities.

- **Improving facilitation** skills require a facilitative leader to use facilitation as a style in an

environment of rapid change such that no single person can see what is going on or what needs to be done. These skills include helping others to do things, to find a view and understand it, to concentrate, to think and communicate their thoughts, to articulate a shared vision and common mission or purpose and to respond to things that are not common.

- **Continuing Professional Development** is the lifelong process of learning and continuing personal development. It is the means by which you can maintain and enhance your knowledge and skills to complement both current and future career progression. Leaders should promote continuing professional development by encouraging others to do the following:
  - Learn new skills and keep up to date with the current knowledge
  - Perform better in their current role
  - Gain a competitive and improve their future employment opportunities
  - Increase self-confidence
  - Enhance professional reputation
  - Achieve tangible evidence of great competence and professionalism

8.3. Change Management

Change management is a structured approach to transitioning individuals, teams, and organizations from a current state to a desired future state, to fulfill or implement a vision and strategy. It is an organizational process aimed at empowering employees to accept and embrace changes in their current environment
(Kotter, John P. "Developing a Vision and Strategy". Leading Change (1996). 72. Library of Congress Cataloging-In-Publication Data. Web. Feb 1. 2011)

We live in a world where change in inevitable. Therefore, any leaders should be prepared to manage change well. There are many theories about how to "do" change. Many originate with leadership and change management guru, John Kotter.

Step 1: Create a Sense of Urgency

For change to happen, it helps if the whole organization really wants it. Develop a sense of urgency

around the need for change.

What should a leader do?

- Identify potential threats and develop scenarios showing what could happen in the future.
- Examine opportunities that should be, or could be, exploited.
- Start honest discussions and give dynamic and convincing reasons to get people thinking.
- Request support from external stakeholders to strengthen your argument.

Step 2: Form a Powerful Coalition

Convince people that change is necessary. This often takes strong leadership and visible support from key people within the organization.

What should a leader do?

- Identify the true leaders in the organization, as well as key stakeholders.
- Ask for an emotional commitment from these key people.
- Work on team building within the change coalition.
- Check the team for weak areas and ensure there a good mix of people from different departments and different levels within the organization.

Step 3: Create a Vision for Change

A clear vision can help everyone understand why asking them to do something. When people see for themselves what the organization is trying to achieve, then the directives they are given tend to make more sense.

What should a leader do?

- Determine the values that are central to the change.
- Develop a short summary (one or two sentences) that captures what you see.
- Create a strategy to execute that vision.
- Ensure that your change coalition can describe the vision in five minutes or less.
- Practice the "vision speech" often.

Step 4: Communicate the Vision

Don't just call special meetings to communicate the vision. Instead, talk about it every chance. Use the vision daily to make decisions and solve problems. When the vision is kept fresh on everyone's minds, they will remember it and respond to it. It's also important to "walk the talk."

What should a leader do?

- Talk often about the change vision.
- Address peoples' concerns and anxieties, openly and honestly.
- Apply the vision to all aspects of operations; from training to performance reviews.
- Tie everything back to the vision.
- Lead by example

Step 5: Empower actions

Removing obstacles can empower the people needed to execute the vision, and this can help the change move forward

What should a leader do?

- Identify, or hire, change leaders whose main roles are to deliver the change.
- Look at the organizational structure, job descriptions, and performance and reward systems
- Recognize and reward people for making change happen.
- Identify people who are resisting the change and help them see what is needed.
- Act to quickly remove barriers.

Step 6: Create quick wins

Create short-term targets, not just one long-term goal. The change team may have to work very hard to come up with quick targets, but each "win" attained can further motivate the entire staff.

What should a leader do?

- Look for projects that can be implemented without help from any strong critics.
- Do not choose early targets that are expensive.
- Thoroughly analyze the potential pros and cons of the targets.
- Reward the people who will help to meet the targets.

Step 7: Build on the Change

Quick wins are only the beginning of what needs to be done to achieve long-term change. To reach that tenth success, leaders need to keep looking for improvements. Each success provides an opportunity to build on what went right and identify what can be improved.

What should a leader do?

- After every win, analyze what went right and what needs improving.
- Set goals to continue building on the momentum achieved.
- Keep ideas fresh by bringing in new change agents and leaders for change coalition.

Step 8: Make it stick

This will help give the desired change a solid place in the organization. It is during this that organizational leaders continue to support the change to be adopted by all its existing staff.

What should a leader do?

- Talk about progress every chance
- Include the change ideals and values when hiring and training new staff.
- Publicly recognize key members of the original change coalition

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https://www.dropbox.com/sh/050lo9lngrradoj/AABcfnJ227mGw4a1oQh-eOvba?dl=0	Improving your facilitation skills webinar
https://www.dropbox.com/sh/hgybzoi4xg376l0/AAAdYfx900hv9hEnsl12oZH2a?dl=0	Continuing Professional Development webinar
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http://supplychainhandbook.jsi.com/wp-content/uploads/2017/01/JSI_Supply_Chain_Manager's_Handbook_Chpt.11_Final.pdf	Financing
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