THE REPUBLIC OF UGANDA
MINISTRY OF HEALTH

THIRD EDITION

UGANDA ESSENTIAL MEDICINES AND HEALTH SUPPLIES MANAGEMENT MANUAL

Department of Pharmaceuticals and Natural Medicines
MINISTRY OF HEALTH

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PREFACE

This manual represents the revised and updated edition of the Essential Medicines and Health Supplies (EMHS) Management Manual, following the initial publication in 2012. The Department of Pharmaceuticals and Natural Medicines (DPNM) of the Ministry of Health, in collaboration with development partners, National Warehouses (National Medical Stores and Joint Medical Stores), supply chain partners, District Health Teams, and health facility representatives, has undertaken the task of revising this manual. The objective of this revision is to provide health workers with an enhanced and up-to-date reference book on managing the supply chain for EMHS at health facilities and community levels.

EMHS expenditure ranks as the second largest within the health sector, right after human resources. Effective management of these resources necessitates health workers who possess the right skills, knowledge, attitude, and practices. Supply chain management (SCM) encompasses a wide range of activities, including selection, quantification, procurement, distribution, storage, and appropriate use of medicines and health supplies. While certain staff in the health sector, such as pharmacists, pharmacy technicians, and supply chain officers, receive supply chain management training as part of their foundational education, there remains a gap in training for many other cadres responsible for handling health commodities. Thus, this revision emphasizes the importance of in-service training to address this gap.

In the past, numerous manuals were developed, each focusing on specific categories of commodities such as antiretrovirals (ARVs), tuberculosis medicines, and laboratory supplies. However, this approach led to the creation of multiple tools and processes that were specific to individual items, resulting in duplication and fragmentation within the healthcare system, which proved to be costly. Consequently, this revised manual consolidates and harmonizes the various tools, providing a standardized approach to managing supplies. By adopting this manual, health workers will gain access to a comprehensive resource that emphasizes the fundamental principles of supply chain management.

Efficient stock control and ordering of EMHS can be achieved by following the guidelines outlined in this manual. Health workers at all levels of care in the public sector are encouraged to implement the stock management system described herein. Given the limited financial resources available for procuring medicines and health supplies, effective stock management becomes crucial to ensure optimal resource utilization. This entails minimizing wastage resulting from overstocking, expiration, and inappropriate use. To facilitate decision-making during budget constraints, this manual introduces the vital, essential, necessary (VEN) classification system, guiding the reduction and prioritization of procurement quantities.

We believe that this revised manual will serve as a valuable resource, laying the groundwork for a more comprehensive, integrated, and institutionalized approach to training in medicines management in Uganda.

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Director General Health Services

Ministry of Health

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Morries Seru

Ag. CHS- Pharmaceuticals and Natural Medicines

Ministry of Health

ACRONYMS

AMC	Average Monthly Consumption
CAO	Chief Administrative Officer
DDA	Dangerous Drugs Act
DDMC	District Disaster Management Committee
DEPRC	District Emergency Preparedness Response Committee
DHC	Diocesan Health Coordinator
DHO	District Health Office
DLFP	District Laboratory Focal Person
DMMS	District Medicines Management Supervisor
DTF	District Task Force
DTLS	District TB and Laboratory Supervisor
eLMIS	Electronic Logistics Management Information System
EM SPARS	Essential Medicines and Health supplies SPARS
EMHS	Essential Medicines and Health Supplies
EMHSLU	Essential Medicines and Health Supplies List of Uganda
EML	Essential Medicines List
EPI	Expanded Program on Immunisation (EPI)
FEFO	First Expiry First Out
FIFO	First In First Out
GHSA	Global Health Security Agenda
HMIS	Health Management Information System
HSD	Health Sub District
HSDP	Health Sector Development Plan
IML	Institutional Medicines List
IMT	Incident Management Team
INN	International Non-proprietary Name
IPD	Inpatients Department

JMS	Joint Medical Store
Lab SPARS	Laboratory SPARS
LMIS	Logistics Management Information System
LSS	Laboratory SPARS Supervisor
MAAIF	Ministry of Agriculture, Animal Industry and Fisheries
MAUL	Medical Access Uganda Limited
MB	Medical Bureau
MMS	Medicines Management Supervisor
MoFPED	Ministry of Finance, Planning and Economic Development
MOH	Ministry of Health
MTC	Medicines and Therapeutics Committee
NADDEC	National Diagnostic and Diseases Epidemiologic Centre
NDA	National Drug Authority
NECOC	National Emergency Coordination and Operations Centre
NMS	National Medical Stores
NPA	National Planning Authority
NPSSP	National Pharmaceutical Sector Strategic Plan
NTF-LC	National Task Force Logistics Committee
OPD	Outpatients Department
OPM	Office of the Prime Minister
PFM	Pharmaceutical Financial Management
PGD	Practical Guideline for Dispensing
PHEOC	Public Health Emergency Operations Centre
PNFP	Private Not for Profit
SCM	Supply Chain Management
SDG	Sustainable Development Goals
SPARS	Supervision Performance Assessment and Recognitions Strategy
STG	Standard Treatment Guidelines

TB SPARS	Tuberculosis and Leprosy SPARS
UAC	Uganda AIDS Commission
UCG	Uganda Clinical Guideline
UHMG	Uganda Health Marketing Group
VIMCB	Vaccines and Injection Materials Control Book
VMMC	Vaccine Vial Monitor
VEN	Vital, Essential, Necessary
WHO	World Health Organization

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DEFINITIONS

Credit line	The credit line is a virtual budget/account at NMS/JMS allocated to all MoH accredited Government and PNFP health facilities from which they order for and/or are supplied EMHS. The credit line is funded by the Government of Uganda.
Discrepancy	This is a situation when there is a difference between what has been received and what is written on the invoice/delivery note or if the items received were not of good quality.
Forecasting	It is the process of estimating the expected consumption of commodities based on historical consumption, service statistics, morbidity and/or demographic data or assumptions when data is unavailable, to calculate the quantities of commodities needed to meet demand during a particular time frame.
Forward logistics	Forward logistics is the flow of products through the supply chain towards the consumer i.e., from the supply side to the demand side. It encompasses movement of products at any stage from manufacturer, warehouses, and facilities to consumers or patients.
Procurement planning	Procurement planning is the process of defining or selecting the products/services and the respective quantities to be procured for a particular period taking into consideration the budget. EMHS procurement planning in Uganda occurs at Ministry of Health, warehouse (NMS/JMS), district and facility levels.
Pull system	This refers to a supply mechanism whereby the facility determines items and quantities to order.
Push system	This refers to a supply mechanism whereby the items and quantities to be supplied to a health facility are pre-determined not requiring an order from the health facility.
Quantification	It is the process of estimating the quantities and cost of the products required for a specific health program (or service) and determining when the products should be delivered to ensure uninterrupted supply for the program.
Redistribution	Redistribution is a practice that involves movement of usable medicines and or health commodities from one health facility /district to another.
Reverse Logistics	Reverse logistics is a type of supply chain management that **moves products from customers back to the sellers or manufacturers**. Once a customer receives a product, processes such as returns, or recycling require reverse logistics.
Standardized Kit	This is a list of predetermined items and quantities for a specific user supplied periodically.
Supply Chain	A supply chain is the collection of processes and resources required to make and deliver a product to the final customer.

Supply Planning	It is the final output of quantification; supply planning details the quantities required to fill the supply pipeline, costs, lead times, and arrival dates of shipments to ensure optimal procurement and delivery schedules.

1. CHAPTER | 1 | MEDICINES POLICY AND REGULATORY FRAMEWORK

1.1. Introduction

The Ministry of Health is mandated to formulate policies, regulations, guidelines, and reforms that govern availability, access, use of medicines and oversee their implementation. These are aligned with the National Health Policy, National Development Plan and Uganda Vision 2040 priorities.

1.2. National Medicines Policy (2015)

The Ministry of Health with technical and financial support from the stakeholders and partners formulated the Uganda National Medicines Policy (NMP) which was approved in 2015 and its implementation started since to-date. The overall goal of the National Medicines Policy is to contribute to the attainment of the highest standard of health for the population of Uganda, by ensuring the availability, accessibility, affordability and appropriate use of essential medicines of appropriate quality, safety and efficacy at all times. The NMP underscores three important principles of quality of care, equity and efficient utilization of available resources. The NMP focuses on supporting the achievement of Universal Health Coverage; increasing funding for medicines; strengthening partnerships and collaboration for health; and on increasing the capacity of Ministry of Health and district health departments to undertake their respective roles for full policy implementation.

The National Medicines Policy (NMP) 2015 is implemented under the direct oversight of the Department of Pharmaceuticals and Natural Medicines in the Ministry of Health. The NMP is operationalized by the National Pharmaceutical Services Strategic Plan (NPSSP) - 2020/21-2024/25.

1.3. National Pharmaceutical Services Strategic Plan (2020/21- 2024/25

The Ministry of Health (MOH) with technical and financial support from the stakeholders and partners formulated a 5-year National Pharmaceutical Services Strategic Plan (NPSSP) 2020/21-2024/24 and has since implemented.

The overall goal of the NPSSP IV (2020-2025) in line with the National Medicines Policy (2015) is to contribute to the attainment of the highest standard of health for the population of Uganda, by ensuring the availability, accessibility, affordability and appropriate use of essential health commodities and pharmaceutical services of appropriate quality, safety and efficacy at all times.

The NPSSP is implemented under the direct oversight of the Department of Pharmaceuticals and Natural Medicines in the Ministry of Health. The strategic plan is implemented through participatory involvement of inter-sectoral and multi-sectoral collaborations and partnerships between the MOH and PNFPs, PHPs, Local Pharmaceutical Manufacturers, HPCs, Associations and Boards, the Pharmacy Board, NDA, NMS, research institutions, Pharmacy and Public Health Training institutions and line ministries.

The NPSSP has eleven strategic priority areas / strategic objectives, namely: (i) Governance, leadership and stewardship; (ii) Health commodity supply chain management system; (iii) Pharmaceutical human resource planning and development; (iv) Regulatory Framework and Compliance; (v) Appropriate Medical Product Use; (vi) Traditional and Complementary Medicines; (vii) Domestic manufacture of health commodities; (viii) Pharmaceutical Services Financing; (ix) Pharmaceutical management information systems and technologies; and (x) Multi-sectoral collaboration and engagement, (xi) Research, development and innovation.

These priority areas re-emphasize the position of health commodities to satisfy the priority health care needs and pharmaceutical services delivery policies to achieve the Universal Health Coverage. To achieve the 11 priority areas in the NPSSP, the Government of Uganda formulated a 10-Year

roadmap for Health Supply Self –reliance (2022- 2032). The roadmap articulates the strategic plan, process and transition as an exit strategy from donor reliance. It lays out a preparatory process of the health supply chain ownership and leadership to the government of Uganda to increase local capacity to plan, finance, and effectively manage the national supply chain independent of donor support and ensure sustainability of development outcomes.

1.4. Medicines Regulation

Medicines regulation involves a combination of legal, administrative, and technical measures that governments take to ensure the safety, efficacy, and quality of medicines, as well as the relevance and accuracy of product information[1]. This section gives an overview of the regulatory framework for the management of medicines in both the public and private sector.

1.4.1. Justification for Medicines Regulation

The use of ineffective, poor quality or harmful medicines can result in therapeutic failure, exacerbation of disease, resistance to medicines, and sometimes death. It also undermines confidence in the health system, health professionals, pharmaceutical manufacturers, and distributors. Access to medicines is a fundamental element of the right to health and is a key target to attainment of Sustainable Development Goal (SDG) 3[2]. The Government of Uganda, therefore, has a constitutional mandate to fulfill the fundamental rights of Ugandans to opportunities and access to health services, and to protect its citizens from social or economic exploitation that is likely to be harmful to their health or physical, mental, spiritual, moral or social development. Government of Uganda Vision 2040 enshrines a competent healthcare system as being essential for attainment of Middle-Income status[3]. The Government has therefore, established an effective national regulatory framework to ensure that the manufacture, trade, importation, exportation, distribution and use of medicines are regulated appropriately, and that the public has access to accurate information on medicines.

1.4.2. Regulation of Medicines and Health Supplies in Uganda

The National Drug Authority is mandated under Chapter 206 of the laws of Uganda with the improvement of government regulation and control of manufacturing, production, importation, exportation, marketing and use of medicines[4]. The Narcotics Drugs and Psychotropic Substances Control Act 2015 provides for the control, possession and trafficking of narcotic drugs and psychotropic substances. Uganda is currently reviewing the Indigenous and Complementary Medicines Bill to control and license the practice of traditional and complementary medicine.

The Pharmacy and Drugs Act Chapter 280 of the laws of Uganda prescribes the standards in the practice of Pharmacy. Other acts govern the other professions in the health sector, including the Allied Health Professionals Act (Chapter 268), the Nurses and Midwives Council Act (Chapter 274) and the Uganda Medical and Dental Practitioners Act (Chapter 272).

The National Medical Stores Act (CAP 207) provides for the efficient and economical procurement of medicines and other medical supplies and the secure, safe and efficient storage, administration and distribution to the public health sector. Under the Public Private Partnerships Policy for health, MOH has engaged private warehouses to complement the National Medical Stores, including Joint Medical Stores and others.

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[1] Lezotre, P. 2014. Convergence and Harmonization of Pharmaceutical Regulations. Academic Press (Elsevier).
[2] World Health Organisation, 2015. *Sustainable development goals*
[3] Uganda National Planning Authority, 2017. Uganda *Vision 2040*
[4] National Drug Policy and Authority Act 1993, Part I (5).

2. CHAPTER | 2 | HEALTH SUPPLY CHAIN LEADERSHIP, MANAGEMENT AND GOVERNANCE

2.1. Introduction

Leadership, governance, and stewardship is one of the six essential building blocks which together make up a functional health system. Generally, good governance both at national and sub-national levels is critical for policy direction and ensuring coordinated, transparent, accountable, responsive, inclusive, efficient, and effective delivery of the health supply chain services. At a health facility, good governance is a critical determinant of quality of healthcare provision and utilization.

Good governance and action-oriented leadership are essential for effective oversight and management of medicines, vaccines and other essential health commodities and technologies. Leadership and governance ensure appropriate management of health commodities that is key to minimizing waste, thus preventing stockouts of commodities at health facilities. Leaders play an essential role in ensuring effective planning and forecasting, procurement, storage, and use of health commodities. Ineffective leadership and governance may lead to corruption, wastage of resources and affects overall quality of pharmaceutical services.

The proposition is that even if the issues that require government intervention improve (such as physical infrastructure, human resources, supply of EMHS, among others), with the outstanding governance deficits, the quality of care does not correspondingly improve.

2.2. National level leadership and governance structures for EMHS management

At the national level, the Ministry of Health leadership and governance structures are charged with the mandate to formulate policy, provide technical oversight, and coordinate overall health sector activities and bring together stakeholders at the national, sub-national and community level for delivery of quality health services. The management of the EMHS is an integral part of this mandate.

The above key oversight functions are managed by the Minister and the Ministers of State. The Permanent Secretary coordinates resources for the effective management of Health Funds. The work of the Permanent Secretary is supported through Administration, Internal Audit, Finance and Accounting, and Procurement units. The PS also works through the Office of the Director General Health Services (DGHS) for guiding technical direction. The DGHS coordinates technical functions for the delivery of Health services. The work of the DGHS is coordinated through the four (4) Directorates and twenty (20) Departments. The agencies of the Ministry of Health such as National Medical Stores (NMS) and National Drug Authority (NDA) are also essential in the procurement, storage, distribution, quality, and safety of the EMHS.

There are also technical working groups in the ministry of health which are mandated to provide policy direction and technical guidance. These include medicines procurement management (MPM), governance, standards and policy and regulations (GOSPOR), and health information, innovation, and research (HIIRE). Table 1 shows the leadership and governance structures at the national level.

2.3. Sub-national leadership and governance structures for EMHS management

At the sub-national level, both the decentralization policy (1992) and the Local Governments Act, 1997 (as amended) gave the local governments central roles in the management of health service delivery. The management of the health commodities supply chain is an integral part of this mandate. The mandate is also stipulated in the district health supply chain management package which provides the scope for essential activities that are required for effective health supply chain (HSC) management at the districts, cities, and municipalities.

The same mandate is further stipulated in the recently launched 10-year roadmap for Government of Uganda's health supply chain self-reliance (2022-2032). The implementation of the roadmap involves national and sub-national stakeholders. At the national level, the multi-sectoral planning, programming, and budgeting for health commodities supply chain key priorities by government ministries, and agencies such as the MoFPED, MoLG, MoPS, MEMD, MoICT/NG, NPA, NITA-U, and Health Development Partners (HDPs) are efforts towards ensuring commodity security in the country. Particularly, the Ministry of Health is committed to provide technical oversight and an enabling policy environment to implement the 10-year road map to realize commodity security.

At the sub-national level, the planning and budgeting processes for health commodities supply chain coupled with the training and capacity building of the district/city/municipality leadership in health commodities supply chain leadership and governance are all efforts towards ensuring effective implementation of the 10-year road map to realize commodity security. The emphasis is on strengthening coordination mechanisms and oversight role among the top leadership both technical and political through the existing decision-making structures and organs in the districts, cities and municipalities to improve health supply performance. The intention is to utilize fully the existing decision-making structures and organs to plan and oversee the implementation of the health commodities supply chain activities in the districts and health facilities.

The same applies to hospital structures and organs such as the top management, Board / Health unit committee, and Medicines Therapeutical Committee.

The key district/city/municipal technical and political leaders in the HSC management include the Chief Administrative Officers (CAOs) or City/ Municipal Clerks, District Chairpersons or City / Municipal Mayors, District Health Officers (DHO) or City/ Municipal Principal Medical Officers, Resident district / city commissioners, Secretaries for health/ social services, district/city/municipal planners, auditors, biostatisticians, health information assistants, health management information systems focal persons, drug inspectors, medicines management supervisors among others. Table 2 below are some of their expected roles and responsibilities in health commodities supply chain management.

2.3.1. Hospital/Health Facility Level

The key hospital / health facility leadership and structures in the HSC management include Directors, medical superintendents, principal / senior administrators, in-charges, and pharmacists, top management, board. health unit management committees and medicine therapeutic committees.

Table 3 below highlights some of the expected roles and responsibilities of health facility staff in health commodities supply chain management.

Table 1: Leadership and governance structure at national level

Structures/Stakeholder	Composition	Roles
MoH and Department of Pharmaceuticals and Natural Medicines	Permanent Secretary Director General of Health Services Directors Commissioner- PNM Assistant Commissioner Supply Chain and Logistics Assistant Commissioner Quality Assurance Principal Pharmacists Senior Pharmacists	• Policy formulation and direction. • Technical Oversight and direction. • Quality Assurance. • Monitoring and Evaluation.
National Drug Authority	Authority Chairman Secretary to the Authority Representative to the public- pediatrician Representative to the public- Lawyer Uganda Herbalists Association Uganda Dental Association- Department of Dentistry General manager, JMS General manager, NMS Director, Natural Chemotherapeutics Research Laboratory Commissioner of Veterinary Services, MAAIF Director General Uganda AIDS Commission (UAC) Director General Health Services, Ministry of Health Chief of Medical Services, Ministry of Defence Head of Pharmacy Department, Makerere University Director, Criminal Investigations Directorate President, Uganda Veterinary Association Commissioner Internal Trade, Min. of Trade, Industry & Cooperatives Commissioner Health Services & Pharmaceuticals Representative of the Pharmaceutical society of Uganda Executive Director, Mulago National Referral Hospital Representative, Uganda Medical Association	• Deal with the development and regulation of the pharmacies and drugs in the country • Approve the national list of essential drugs and supervise the • revisions of the list in a manner provided by the Minister • Estimate drug needs to ensure that the needs are met as • economically as possible • Control the importation, exportation and sale of pharmaceuticals • Control the quality of drugs • Promote and control local production of essential drugs • Encourage research and development of herbal medicines • Promote rational use of drugs through appropriate professional training • Establish and revise professional guidelines and disseminate information to health professionals and the public • provide advice and guidance to the Minister and bodies concerned with drugs on the implementation of the national drug policy • Perform any other function that is connected with the above or that may be accorded to it by law.

Structures/Stakeholder	Composition	Roles
Warehouses	National Medical Stores Joint Medical Stores	• Procure, store, and distribute quality medicines and health supplies for the public health sector.
Technical Working Groups	Medicines Management and Procurement / Commodity Security Group Governance, standards and policy and regulations (GOSPOR) Health information, innovation, and research (HIIRE)	• Provide technical guidance on the specific aspects of health products procurement, management, and related components at regular intervals. • Ensure that appropriate standards and regulatory aspects for health products and technologies are aligned and implemented as proposed in the 10-year supply chain roadmap. • Coordinate all actors in the national health supply chain to guarantee their complete alignment to the 10-year supply chain roadmap. • Ensure high-level alignment, efficiency, and better use of resources for EMHS. • Continuously review commodity security risks associated with the transition processes and develop appropriate action plans. • Coordinate the national warehouses (NMS, JMS) and the rented warehouses to ensure effective redistribution and management of EMHS at all levels. • Lead the review processes for health commodities security across all levels.

Table 2: Expected roles of the leadership and governance structures at sub-national level

No	Name of Stakeholder/Committee	Expected roles and responsibilities
1	District Chairperson / City/municipal mayors	• Ensure that HSC activities are incorporated in the strategic and annual plans and budgets. • Demand HSC data for update and discussion during the management meetings (e.g., stock status, functioning of eLMIS in HFs, state of medicine stores in HFs, human resources in HFs, general health facility infrastructure).

No	Name of Stakeholder/Committee	Expected roles and responsibilities
		• Guide the Clerk to Council and Speaker to include HSC issues on the agenda for district council sessions. • Oversee the implementation of the HSC action points and resolutions of the DEC and Council sessions through supervision visits.
2	Chief Administrative Officer (CAO)/ City/ Municipal clerks	• Manage technical teams to effectively incorporate HSC activities in the district strategic and annual plans and budgets. Participate in the procurement planning for EMHS. • Periodically review, verify, and make follow-up on the HSC data / reports. • Ensure accurate HSC data is presented at management meetings for updates, discussions and decision making.
3	District Health Officer (DHO) / City / Municipal medical officers	• Prepare HSC activities to be incorporated in the district strategic and annual plans and budgets. • Review and verify HSC data before being presented / submitted. • Ensure timely submission of accurate and complete HSC stock status data (EMHS, FP, and Vaccines) into DHIS 2 and EPIVAC. • Present the HSC data / reports during the DEC, TPC or District council.
4	Resident district/ city commissioner / DISOs	• Supervise the health commodities supply chain service delivery. • Oversee and verify the delivery of EMHS at both the district / city / municipal stores and health facilities. • Demand HSC data presentation of key issues from DHO or CAO or Secretary social services or Biostatistician to include on the agenda for security meetings (RDC/RCC/ DISO/GISO). • Oversee the implementation of the HSC action points.
5	The District / City/Municipal Planner	• Incorporate the HSC activities in the strategic and annual plans and budgets. • Participate in the procurement planning for EMHS. • Demand HSC data for update and discussion during the TPC meetings.
6	District Senior Pharmacist	• Coordinate and liaise with DHO, Biostatisticians, and health facility-based records and stores personnel to: o Prepare HSC activities to be incorporated in the district strategic and annual plans and budgets. o Oversee the collection and analysis of HSC data. o Present the analyzed HSC data to the DHTs and district management meetings for decision making. o Oversee timely submission of accurate and complete HSC data reports to DHIS 2 with particular reference to HMIS 105 section 6. o Oversee the effective use of MoH approved eLMIS.
7	District Biostatistician	• Demand and analyze HSC data from health facility in-charges/ stores personnel in the health facilities.

No	Name of Stakeholder/Committee	Expected roles and responsibilities
		• Submit the analyzed HSC data to DHO/City /Municipal Medical Officers to inform decision making on a regular basis. • Ensure timely submission of accurate and complete stock status for EMHS report (HMIS 105 (6) approved by DHO to DHIS 2. • Participating in the procurement planning meetings for EMHS in the district.
8	The District Health Team (DHT)	• Manage data driven procurement planning meetings for EMHS in the district. • Periodically review, verify, and discuss HSC data (stock status, functioning of eLMIS in HFs, state of medicine stores in HFs, human resources in HFs, health facility infrastructure). • Supervise HSC health service delivery in the district /HFs. • Ensure appropriate HSC staffing.
9	The District Executive Committee (DEC)	• Include on the agenda a presentation of the HSC data / reports. • Demand HSC data presentation of key issues from DHO or CAO or Secretary social services or Biostatistician. • Oversee the implementation of the HSC action points.
10	The Clerk to / Council	• Include on the agenda a presentation of the HSC situation to be made by DHO or CAO or Secretary social services or Biostatistician to guide planning and budgeting. • Legislate, plan, budget, mobilize resources and appropriate funds for HSC activities, and enforce accountability and monitor HSC service provision. • Approve the district plans and budgets with HSC components incorporated (HSC HR, Supervision, IT equipment maintenance, HSC infrastructural development, etc.) • Oversee the implementation of the council resolutions on the HSC service delivery through integrated supervision, monitoring and inspections.
11	District/City / Municipal Auditor	• Demand HSC from DHO or CAO or Secretary social services or Biostatistician or health facility in-charges. • Conduct audit assessments on EMHS stock status and quantities of distribution cycles.
12	District/City / Municipal ICT Officer	• Regularly assess the ICT needs. • Support the procurement, repair, and maintain the ICT equipment for full functionality.
13	Medicines Management Supervisors / Drug Inspectors	• Provide support supervision to health facility staff to build their competences in the management of the EMHS. • Conduct assessment of health facility staff performance on the management of EMHS.

Table 3: Expected roles of hospital / health facility leadership in health supply chain management

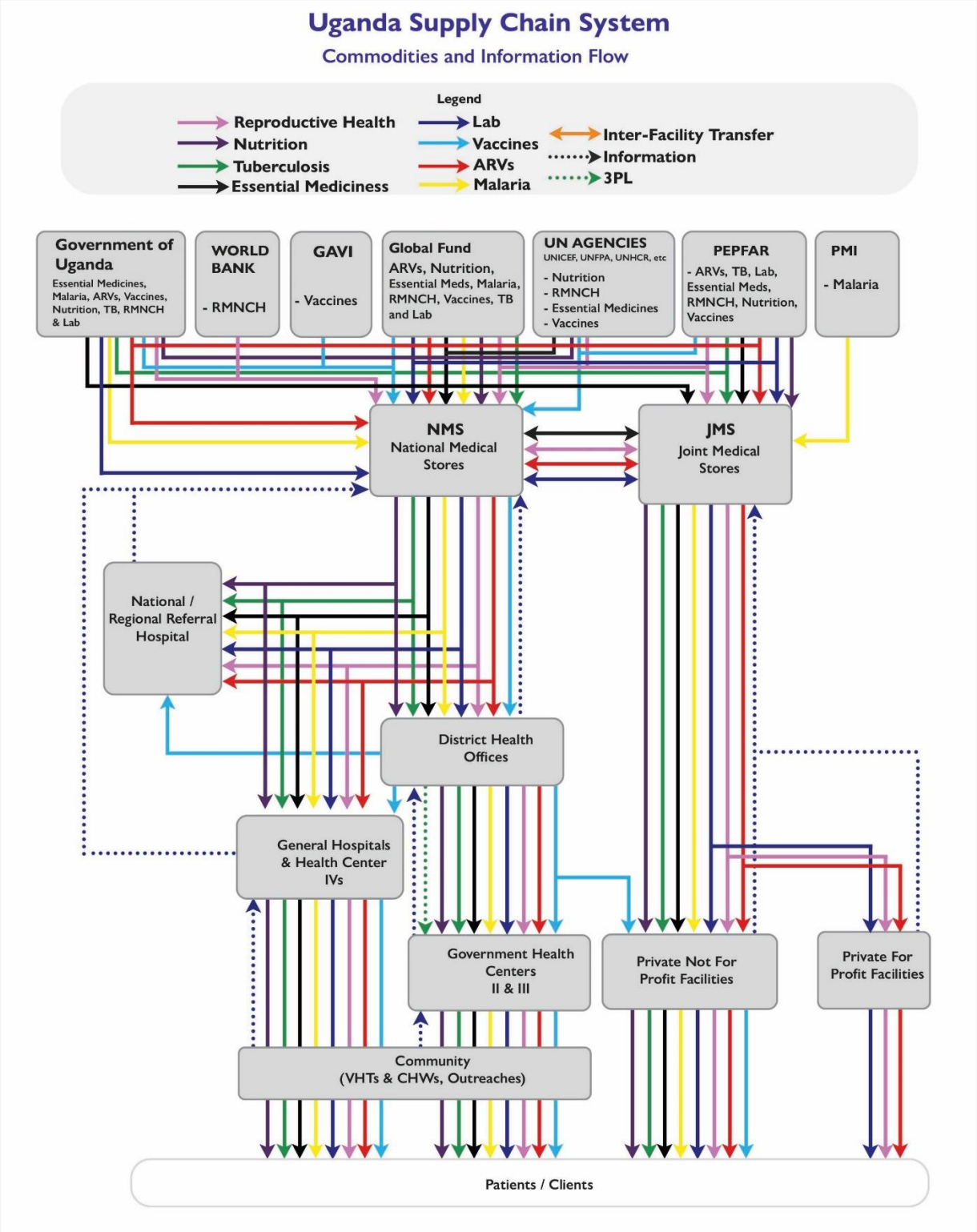
No	Name of Stakeholder/Committee	Expected roles and responsibilities in the HSC management
1	Director / In-charge	• Ensure that HSC activities are incorporated in the hospital strategic and annual plans and budgets. • Organize periodic meetings to review and verify HSC data before being presented / submitted. • Ensure timely submission of accurate and complete HSC stock status data (EMHS, FP, and Vaccines) into DHIS 2 and EPIVAC. • Present the HSC situation / reports during the Board meetings. • Ensure the implementation of the HSC action points. • Support functionality of MoH approved eLMIS for managing commodities. • Conduct quarterly medicines audit for the tracer medicines and any other medicines as prescribed by MoH to ensure traceability and accountability.
2	Pharmacist	• Prepare HSC activities to be incorporated in the district strategic and annual plans and budgets. • Liaise with records and stores personnel to collect and analyze HSC data. • Present the analyzed HSC data to the Director for review. • Timely submit accurate and complete HSC data reports to DHIS 2 • Ensure effective use of MoH approved eLMIS. • Ensure data driven orders are made timely to the warehouses.
3	Hospital board / HUMC	• Ensure that HSC activities are incorporated in the strategic / annual plans and budgets. • Verify and validate the deliveries of the EMHS. • Monitor implementation of HSC strategic activities.
4.	Medicines Therapeutic committee	• Maintain an up-to-date institutional medicines list. • Develop and disseminate medicines management and use policies and procedures. • Identify and investigate medicines use problems. • Ensure effective monitoring, management and reporting of medicines adverse events and reactions, antimicrobial resistance, and medication errors.

3. CHAPTER | 3 | SUPPLY CHAIN MAP, SELECTION, QUANTIFICATION AND PROCUREMENT PLANNING

3.1. National Supply Chain Map

Provides an initial level of visibility on the key components at the national, sub-national, health facility, and community levels. The national supply chain map is critical as it shows how health commodities and information flow to the final consumer. Figure 1 below shows the current supply chain map.

Figure 1: Uganda supply chain system



3.2. Selection of Essential Medicines and health supplies

Essential Medicines are those health commodities that satisfy the health care needs of most of the population, at a price they and the community can afford [5]. Public sector medicines and health supplies are included in the Essential Medicines and Health Supplies List for Uganda (EMHSLU), which is used to guide procurement and supply. The lists are developed at the national level based on the Uganda Clinical Guidelines, National Laboratory Test Menu and Techniques and other national guidelines. The rationale for the selection and use of a limited number of essential medicines is that it leads to an improved supply of medicines, more rational prescribing, and lower costs.

Essential medicines are selected according to the following criteria:

1. Disease pattern
2. Public health relevance
3. Evidence on efficacy and safety
4. Adequate scientific data and evidence of performance in a variety of settings
5. Adequacy of quality
6. Favourable cost-benefit ratio
7. Desirable pharmacokinetic properties,
8. Availability of health infrastructure and equipment,
9. Capacity of medical staff to prescribe the medicine, and use the equipment,
10. The possibility for local manufacture, and availability as single compounds (Management Sciences for Health, 2012).

3.2.1. Advantages of a limited list of essential medicines and health supplies

Table 4 below shows the objectives and benefits of a limited list of essential medicines and health supplies.

Table 4: Advantages of a limited list of essential medicines and health supplies

Major objective	Benefits
Supply	Easier procurement, storage and distribution
	A manageable product range
	Better quality assurance
Prescribing	Training more focused and therefore simpler
	More experience with fewer medicines
	Non availability of irrational treatment alternatives
	Appropriate medicine use
	Focused drug information
	Better recognition of adverse drug reactions
Cost	Economies of scale

[5] WHO, 1977. The Selection of Essential Drugs. Report of a WHO Expert Committee. World Health Organization.

Major objective	Benefits
	Lower inventory holding costs
Patient use	Focused Education efforts
	Appropriate medicine use
	Improved medicine availability

Source: Management Sciences for Health 2012

3.2.2. Guiding Principles of the EMHSLU

The EMHSLU is made up of four (4) categories, namely essential medicines, general health supplies list, specialist health supplies list and the laboratory supplies list.

The following principles are applied in the EMHSLU:

- Categorization of medical supplies according to therapeutic indication and VEN classification
- Stratification according to relevance at the different levels of care
- Use International Non-proprietary (generic) Names.

3.3. Quantification

Quantification is the process used to estimate how much of the specific EMHS is needed for procurement for a specific period to ensure an uninterrupted supply. EMHS can be quantified using one or a combination of the standard methods. These include consumption, morbidity,proxy method and service level projection of budget requirement.

3.3.1. Consumption method

Involves use of the past consumption records for individual medicines to project future needs. In many instances, the consumption method is the most precise method for quantifying EMHS usage provided the source data are complete, accurate, properly adjusted for stock outs and anticipated changes in demand and use. The likely sources for data on consumption include dispensing log, stock cards, stock book, Electronic Logistics Management Information Systems (eLMIS).

How to use the updated stock card and stock book to extract consumption data for each EMHS item.

3.3.1.1. Using a stock card

1. Determine the quantity consumed in the last 12 months or 365 days (preferably previous financial year).
2. Calculate the number of months or days you were out-of-stock for this item in 12 months or 365 days.
3. Determine the number of days or months the item was available in the period of review by subtracting the days or months you were out of stock from 365 days or 12 months.
4. Divide the consumption by the number of months or days it was available, and multiply by 12 months or 365 days.

3.3.1.2. Using a stock book

1. Add up the calculated monthly consumption for the last 12 months in the "adjusted MC" column (aMC) for each EMHS.
2. Make a note of the total at the bottom of the page for each item.

It is important to realize that the appropriateness of past drug use may or may not correspond with public health priorities and needs, thus irrational drug use may be promoted with the consumption method. For example, the use of expensive EMHS might be interpreted as a need, whereas cheaper EMHS would suffice.

3.3.2. Morbidity Method

Estimates the need for specific medicines based on the population and patient attendances, actual or projected incidences of health problems and standard treatment guidelines or diagnostic protocols. The approach involves the following steps:

1. List the major specific health problems or diseases encountered at the health facility.
2. Use the standard treatment guidelines to determine the appropriate generic name, dosage form and strength of each drug to be used in the treatment for each health problem.
3. Calculate the quantity required to treat an episode of the disease (QE) by the formula below:

$$= Basic\ units\ per\ dose\ or\ administration \times Number\ of\ doses\ per\ day \times Length\ of\ treatment\ in\ days$$

Example

The standard treatment guidelines state that pneumonia treatment includes use of 500mg amoxicillin, 3 times per day for 7 days. Amoxicillin is available as 250mg tablet.

QE = $(500mg/250mg) \times 3 \times 7$

QE= 42 Capsules

4. Determine the number of treatment episodes of each health problem at the facilities. A treatment episode is a patient contact for which a standard course of drug treatment is required. For example, in the past year there were 300 episodes of pneumonia per 1000 contacts in 100,000 population. The number of treatment episodes is calculated as follows:

Treatment episodes $= \frac{300 \times 10,0000}{1,000}$

$= 30,000$ episodes per year

5. Calculate the total Quantity for each commodity required for the forecast period with the formulae below:

$$Total\ quantity\ of\ a\ drug\ required\ for\ a\ given\ health\ problem = Quantity\ of\ the\ drug\ specified\ for\ a\ standard\ course\ of\ treatment \times Number\ of\ treatment\ episodes\ of\ the\ health\ problem$$

Therefore, the quantity of amoxicillin required in the management of Pneumonia is:

$$42\ capsules \times 30,000 = 1,260,000\ amoxicillin\ capsules$$

The challenges associated with using this method are limited data on morbidity patterns, and difficulty in defining standard treatments, which make applying this method to every health problem hard. Despite the limitations of this method, it is the best alternative for quantification if consumption data is unavailable, or for estimating budget needs, or a new program with no consumption history such

as HIV/AIDs program rolling out antiretroviral therapy. Where a facility decides to use the morbidity method in quantification, there is need to cross reference with the consumption method. If both methods agree, then the morbidity method can be used and if not consider the consumption method.

3.3.3. The Proxy Consumption Method

Uses data on medicine consumption, demand, or use and/ pharmaceutical expenditure for different facilities and extrapolates this information to another facility taking into consideration the population coverage or service level. This method is used when the other methods of quantification are unreliable. The steps involved in this method include:

1. Selection of standard facilities; when selecting the standard facilities, they should closely resemble the facility parameters for which the estimate is made if feasible. These parameters include, population served, morbidity patterns, prescribing patterns, level of care.
2. Review the records of the standard facility to compile population data that is the number of patients that visited the facility.
3. Determine the consumption rate for the standard health facilities: This is calculated by dividing the annual consumption by the number of patients that visited the facility.
4. Extrapolate the standard health facility's consumption rate to the target facility by multiplying the consumption rate by estimated number of people the target facility is expected to serve.

This is also used for new facilities which may lack consumption or morbidity data using data from facilities with similar characteristics (similar level of care, catchment population, disease burden and diagnostic capacity). This method is not very accurate since it uses data from another facility. Hence routine monitoring of consumption should be emphasized.

3.3.4. Service level projection of budget requirements

This method uses average medical supply procurement cost per attendance or bed-days in different types of health facilities in one system to project needs for similar types of facilities in another system. It does not forecast needs for specific medicines but provides a clear, logical justification for EMHS financing requirements. This method uses the following steps:

1. Establish the categories of health facilities and the number of health facilities in each category. The number of facility categories used depends on the size and scope of the target health system (e.g., 20 facilities at HC2 level if you are forecasting for a HC2 or 10 HC4s if your target is to forecast for a HC4 facility, or picking a given number of facilities from each level of care if your interest is to have a regional or National forecast).
2. Determine the patient contact denominators for each type of facility, and compile or estimate the average number of patient contacts of each type at each level of care (e.g., inpatient contacts, outpatient contacts, major surgery contacts, etc. in each health facility).
3. Calculate the average cost per contact. This is derived by dividing the total EMHS purchases for a sample of facility (s) by the total attendances. In facilities with both inpatients and outpatients, the fraction of total procurement costs attributable to each category must be estimated.
4. Calculate the total projected EMHS financial need. Multiply the average number of patient contacts for each facility by the number of facilities. This is then multiplied by the average EMHS cost for that category of patient in that level of care. These totals are then summed to produce the total financial EMHS cost.

3.4. Making Annual Procurement Plans

The Government of Uganda has centralized the funds for the procurement of EMHS in the public and PNFP sector. The warehouses procure and distribute EMHS to the health facilities based on the EMHS budget allocations and the aggregated facility procurement plans. This section describes the recommended approach to procurement planning at both high and lower-level facilities.

3.4.1. What is procurement planning?

At the facility level, procurement planning is the process of defining or selecting the products/services and the respective quantities to be procured for a particular time period taking into consideration the budget.

3.4.2. Why develop procurement plans?

Procurement plans developed at health facility level are aggregated to inform the procurement plan at national level and guide ordering of EMHS from the central warehouses. This means that inaccurate quantification at health facility level can result in an inaccurate national procurement plan leading to stockouts, understocking or overstocking of EMHS, yet the allocated resources are scarce.

3.4.3. Who should be involved in development of a procurement plan?

Procurement planning team should include a political leader, prescribers, user departments, stores manager, pharmacy staff and administration/finance staff. In facilities where there is an active MTC, they should lead the procurement planning process. MTC may co-opt additional members to support the process. Where necessary, warehouse representatives, MoH representatives, and or IPs may provide technical guidance during the procurement planning process.

3.4.4. Tools and information needed to develop a procurement plan

The following tools and information are required to prepare a procurement plan:

1. Updated Uganda Clinical Guidelines
2. Treatment and Prescribing guidelines
3. Other disease specific guidelines
4. Essential Medicines and Health Supplies List of Uganda (EMHSLU)
5. Past and projected patient attendance
6. Price catalogues or latest invoices/delivery notes with prices of commodities
7. Health facility annual budget allocation
8. Updated stock books
9. Updated stock cards
10. Practical guidelines for dispensing

3.4.5. Steps for procurement planning

The entry meeting shall be convened by the pharmacy Department/unit. The following shall be in attendance:

a. Technical staff/user units
b. Administration of the health unit
c. Representative of the Health Unit Management Committee/Board members
d. Political leaders

The purpose of the entry meeting is to discuss:

a. Objectives of the meeting
b. The quantification process
c. Tools for data collection
d. Review period
e. Allocated budget as communicated by NMS.

3.4.5.1. Step 1: Selection

Involves the critical assessment of medicines and supplies required in diagnosis, treatment, and care, taking into consideration specific needs required within each level of care. The rationale of the

product selection processes is to increase resource optimization and efficiencies within the procurement system. The selection of commodities to be quantified is guided by the following:

- EMHSLU
- Consumption data
- UCG
- Expected changes in morbidity patterns
- Procurement plan/product catalogue.

3.4.5.2. Step 2: Quantification and forecasting

The different methods of quantification presented in section 2.1 should be used to determine the quantities of EMHS needed to meet the needs of the population being served for the specified period.

3.4.5.3. Step 3: Costing

Apply the indicative prices for each item (from the planning templates/product catalogue) to the estimated quantities and add up the costs for all items to obtain a costed non-vetted requirements list or "wish list". Each health facility is required to have a needs'-based wish list to inform the development of the health facility non-vetted requirement list. Lack of these individual wish lists will result into under representation of the individual facilities during the development of a procurement plan/kit. Needs based wish list may be established from the needs analysis activity.

3.4.5.4. Step 4: Vetting/Prioritizing

When funds are not available to purchase all the health commodities included in the wish list, reducing the list according to health system resources is required. The following tools can help with prioritization.

a. The VEN concept involves the reducing or complete removal of the necessary (N) Items to fit within the budget. If after removal of the N items the need still exceeds the budget, consider reducing the E. If complete removal of the E items, the need still exceeds the budget consider reducing the V items.
b. Therapeutic category analysis: Analysis of the therapeutic choices to help select the best medicines for treating common diseases while minimizing overall cost to the health facility. This helps to remove duplicates and select the cheapest: Note if a good selection has been made this should not be an issue.
c. ABC analysis: is analysis of expenditure and quantities of items consumed over a certain period to identify the items that accounts for the high cost and high use when considering ways to reduce procurement costs.

3.4.5.5. Step 5: Approval of the final procurement plan

After developing the procurement plan, ensure that it is approved by the authorized person at the different levels of care before submitting to the respective warehouses. Each health facility is expected to keep and file a signed hard copy of the final procurement plan/kit.

3.4.5.6. Step 6: Procurement plan performance monitoring

Ideally if the perfect procurement plan was developed, the health facility order would not vary so much from the procurement plan. It is the responsibility of the health facility to monitor its adherence to procurement plan submitted. Monitoring adherence to the procurement involves comparing the submitted orders with the procurement plan for that financial year.

- Calculate the difference in quantities between what was included in the procurement plan and order form.

- Sum up the items that were under planned. For government facilities, under planned items are those whose quantity ordered exceeded 10% of the quantity in the plan.
- Sum up the items that were over planned. For government facilities, over planned items are those whose quantities ordered where below 10% of the quantity in the plan.
- Calculate the percentage of over planned items = (Over planned items/ total number of items in the procurement plan) *100
- Calculate the percentage of under planned items = (under planned items/ total number of items in the procurement plan) *100

The higher the percentage of over planned and under planned activities, the more reason the facility needs to investigate, identify, and prevent the underlying factors from happening in future.

Failure to adhere to the plan may imply changes in disease patterns, prescribing patterns, poor quantification, and changes in the standard treatment guidelines (STGs).

KEY POINTS

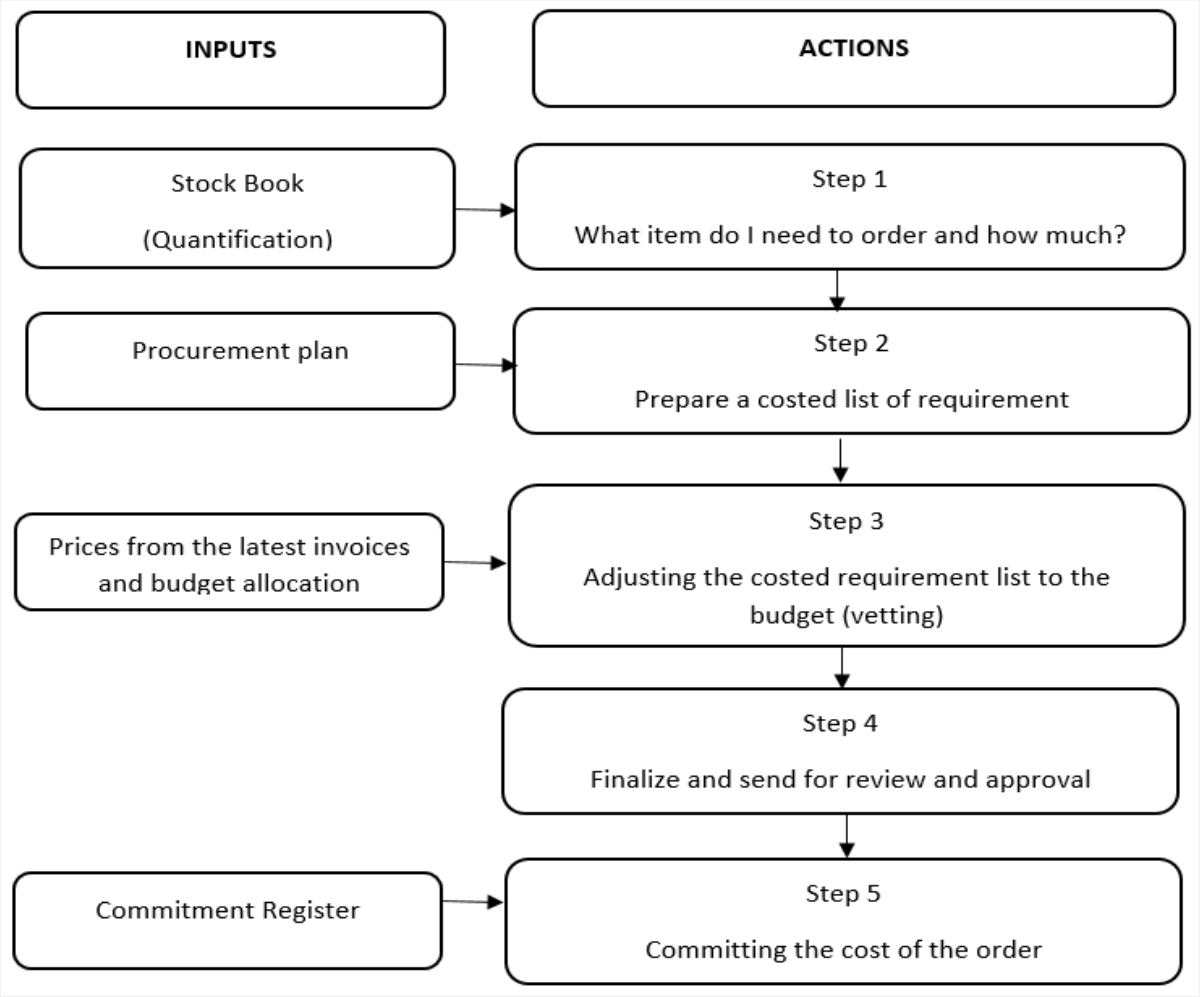
- Essential Medicines Concept has been applied worldwide to increase access to EMHS.
- Limited resources should be used to provide priority medicines that meet 80% of the population requirements.
- The VEN classified lists should be the guide to health facility workers and planners.
- A representative, credible and competent team should be responsible for selection and classification of health commodities.

4. CHAPTER | 4 | ORDERING EMHS

All Essential medicines and health supplies should be systematically controlled and ordered. The system described in this manual is applicable to all items independent of procurement source. This part will describe the procedures for ordering (that is from NMS and JMS) and completing requisitions. Sometimes an emergency occurs; therefore, instructions are provided on how to make special orders. Finally, the procedures related to vetting and costing are described.

4.1. How to Order EMHS

Figure 2: Steps for preparing an order



4.1.1. Step 1: What items do I need to order and how much?

Every ordering cycle, or in accordance with a schedule agreed upon with the warehouse/supplier, the facility must prepare an order. The process of preparing an order should be started in time so that you are sure to meet the supplier's deadlines for submission of orders.

4.1.1.1. What to order

Only order those items indicated in the EMHSLU that are authorized for and needed by the facility according to the procurement plan. The EMHSLU classifies all commodities by "level of care" as illustrated see in

Figure 3 below. For example, if the level of care for an item is marked "HC4", then only HC4 and the levels above can order this item. Therefore, in this scenario, HC2 and HC3 cannot order for this item.

Figure 3: An extract of the EMHSLU showing classification by level of care and VEN

MEDICINE	DS	STR	L	C
Flumazenil	Injection	0.1 mg/ml	H	N
Sodium thiosulphate	Injection	250 mg/ml	NR	N
Protamine	Injection	10 mg/ml	H	E
5.ANTIEPILEPTICS/ANTICONVULSANTS				
Carbamazepine	Tablet	200 mg	HC3	V
Carbamazepine	Tablet	300 mg	RR	V
Carbamazepine	Tablet (chewable)	100 mg	HC4	N

4.1.1.2. Which items should be ordered?

To start, make a physical count of each item in the store room, enter the figures onto the stock card and use a red pen to draw the line, and then enter the physical count into the stock book. For every item in the stock book, compare the recorded "balance on hand" (this month's physical count) with the recorded "Maximum stock quantities". If the balance on hand (physical count) is more than the maximum stock level, an order is NOT needed. If the balance on hand figure is less than the maximum stock quantities, then an order is needed (Maximum stock level is four months of stock for most medicines and two months for vaccines

4.1.1.3. How much to order

Using the stock book, you can determine the quantity to order. Subtract the figure recorded under balance on hand from the figure recorded under maximum stock quantities. This gives you the amount to order:

$$Quantity\ to\ order = Maximum\ stock\ quantities - Balance\ on\ hand$$

Enter the figure in the quantity to order column in the stock book. Go through all items in the stock book in a similar manner and decide whether to order, and if an order is to be made, calculate the quantity to order and enter the quantity to order in the stock book.

Taking the example from the stock book for August:

Balance on hand = 27; Maximum stock quantities = 100;

Quantity to order: 100 – 27 = 73 packs

You should respect the suppliers' minimum unit of measure when making an order. For example, if the minimum unit of measure is 50, the quantity ordered should be in multiples of 50 (50, 100, 150, etc.). This issue is minimized by introducing pack size instead of single units such as tablets.

4.1.1.4. When to order

Orders should be submitted according to the suppliers' order and delivery schedules except for emergency situations. For government facilities, lower levels- HC II and HC III- receive district facility-based orders (Modified PUSH) except for Reproductive Health, HIV test kits, ART, and anti TB medicines for which all accredited health facilities are required to pull. The list of EMHS that can be pulled by facilities may-be expanded by MoH based on available resources and capacity to order. HC

IV and above make their orders according to needs and resources available (Pull). All PNFP facilities should submit their orders to the warehouse as per the order and delivery schedule.

4.1.2. Step 2: Preparing a costed list of requirements

The items identified as required from the stock book as described in Step 1 are compiled into a Requirement List. This list has items and quantities that are required in that period. Include the item name/strength and the unit size information from the stock book, so that you can clearly identify the item, and the quantity to order, and then list the VEN classification from the EMHSLU (See Table 5 below).

Table 5: Requirement List

Item	VEN	Unit	Quantity to order	Unit cost
Mebendazole 500 mg	E	1.000	20	
Amoxicillin 250 mg	V	1.000	9	
Benzyl benzoate 25%	N	1 bottle 100 ml	50	
Cetrimide + chlorhexidine sol 0.15% + 0.015%	N	1 bottle 500 ml	5	
Cotrimoxazole tabs 480	V	1.000	23	
Doxycycline 100 mg	V	100	90	
Magnesium trisilicate compound 250+120 mg	E	1000	5	
Paracetamol 500 mg	E	1.000	12	
Calamine lotion 5% 100 ml	N	1 bottle	7	

Based on the requirements list, you can now calculate the cost of what you would procure if sufficient funds are available. This requirements list will enable you to reduce or remove items and quantities based on the available funds as allocated in the procurement plan and VEN classification before filling in the order form.

4.1.2.1. Calculating the Cost of Order

Multiply the unit cost of the item by the number of units being ordered to find the total cost for each item. Add up these totals to find the total cost of the whole order.

Step-by-step instructions are given below for working out the estimated cost of your order:

- As you write down each item that you intend to order, write its price in the "Unit cost" column on the requirements list sheet. The price you should use is the latest price obtained from the supplier or from the received invoice.
- Using a calculator, multiply the unit cost by the unit quantity that is being ordered and write the figure in the column marked "Total cost" (round off to the nearest Uganda shilling [UGX], 100, 1,000, or 10,000, depending on the UGX value, to make calculations easier).
- Add up the total cost as shown in Table 6.

Table 6: Costed requirement list

Item	VEN	Unit	Quantity to order	Unit cost	Total cost (Quantity to order x unit cost)
Mebendazole 500 mg	E	1.000	20	5300	106,000
Amoxicillin 250 mg	V	1.000	9	32,750	294,750
Benzyl benzoate 25%	N	1 bottle 100 ml	50	1,050	52,500
Cetrimide + chlorhexidine sol 0.15% + 0.015%	N	1 bottle 500 ml	5	37,900	189,500
Cotrimoxazole tabs 480	V	1.000	23	15,200	349,600

Item	VEN	Unit	Quantity to order	Unit cost	Total cost (Quantity to order x unit cost)
Doxycycline 100 mg	V	100	90	2,900	261,000
Magnesium trisilicate compound 250+120 mg	E	1000	5	3,900	19,500
Paracetamol 500 mg	E	1.000	12	7,700	92,400
Calamine lotion 5% 100 ml	N	1 bottle	7	1,450	10,150
Total					1,375,400

4.1.3. Step 3: Adjusting the costed requirement list to the allocated budget (vetting)

4.1.3.1. Adjusting to the Available Budget

The total cost that you have just calculated is now compared to the EMHS budget for that cycle (as in the procurement plan). How to find out about the budget and how to keep track of expenditures can be found in the Pharmaceutical Financial Management Manual. If the cost is higher than your budget you will need to revise your requirement list to reduce the total cost and remain within the available budget. In many cases the facility budget will not be enough to buy all the EMHS that meet the estimated requirements. The VEN methodology can be used to prioritize or vet the items and quantities.

4.1.3.2. The VEN Concept

The ***Vital, Essential, Necessary (VEN)*** classification aims to prioritize items by the magnitude of their clinical relevance to guide procurement by warehouses and drug ordering by health facilities. The aim is to ensure that the most vital medicines are given **priority** when procuring so that they are always available at all times.

The VEN principle applies to all health commodities including sundries, laboratory items and consumables.

V: Vital drugs are potentially lifesaving, and unavailability would cause serious harm and side effects, must be available always;
E: Essential drugs are effective against less severe but nevertheless significant forms of illness but are not absolutely vital to providing basic health care;
N: Necessary (or sometimes called **non-essential**) drugs are used for minor or self-limited illnesses, are of questionable efficacy, or have a comparatively high cost for a marginal therapeutic advantage.

4.1.3.3. Vetting

Figure 4: Health workers preparing a vetted requirements list

It is important to note that some items are supplied "free of cost" to the health facility (i.e., the items do not reduce the health facility credit line and hence should not be included when costing and vetting the order). Current examples include Artemether/Lumefantrine tablets, ARVs, Fluconazole tabs, contraceptives, HIV test kits and anti-TB medicines. The suppliers (NMS or JMS or MAUL) or MOH programs will periodically update the health facilities on which items belong in this category.

Revising the total cost of the order should be based on VEN prioritization. The first step in the vetting (as illustrated in Table 7) is to remove some or all the N items and re-calculate the costing. If the total cost is still above the budget, remove or reduce the quantities of E items. Only when all E items are removed can you consider reduction of quantities of V items to fit your budget. When the cost of the list of requirements is within the allocated periodic budget, transfer this information and fill in the supplier's (NMS or JMS) blank order form, HMIS 085. The vetting should be done for all your EMHS together because they are taken from the same budget. Laboratory supplies have a separate budget, and you should follow the same practices when ordering laboratory supplies.

For example, if the annual budget is UGX 6 million. This gives you a budget of (6.000.000/12 month) = UGX 500.000 per month, and (500.000 × 2) = UGX 1.000.000 for 2 months (bimonthly). The estimated cost was in Table 6, UGX 1.375.400. You will therefore need to cut to fit the available budget/funds of UGX 1 million. In this case, the cost of UGX 1,375,400 was reduced to 999,250 as shown in Table 3 below. The process of vetting is easy to do using an excel spreadsheet if you have access to a computer, but is also easy to do manually, although it takes more time. Keep the final requirements list in your files.

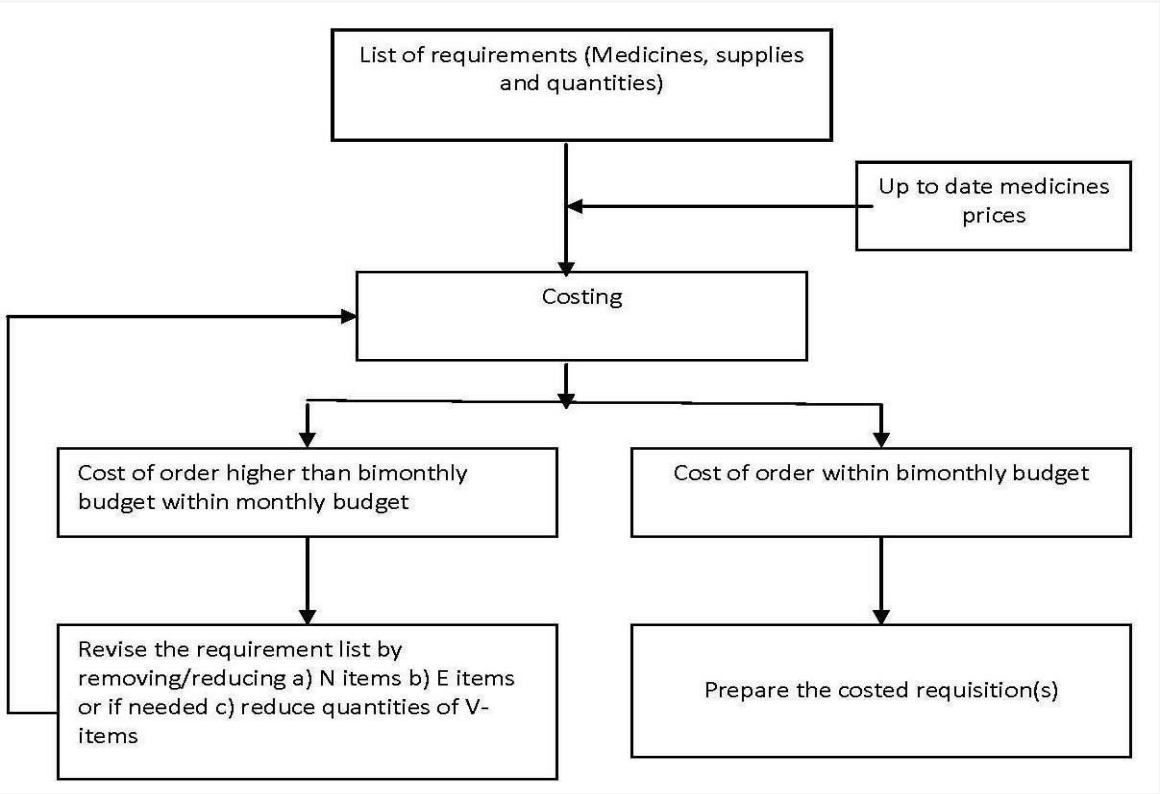
Table 7: Requirements list adjusted to available Funds

Item	VEN	Unit	Quantity to order	Unit cost	Total cost (Quantity× Unit cost)
Mebendazole 500mg	E	1.000	9	5,300	47,700
Amoxicillin 250 mg	V	1.000	9	32,750	294,750
Benzyl benzoate 25%	N	1 bottle 100 ml	0	1,050	0
Cetrimide + Chlorhexidine sol 0.15% + 0.015%	N	1 bottle 500 ml	0	37,900	0

Item	VEN	Unit	Quantity to order	Unit cost	Total cost (Quantity× Unit cost)
Cotrimoxazole tabs 480	V	1.000	23	15,200	349,600
Doxycycline 100 mg	V	100	90	2,900	261,000
Magnesium trisilicate compound 250 +120 mg	E	1.000	0	3,900	0
Paracetamol 500 mg	E	1.000	6	7,700	46,200
Calamine lotion 5% 100 ml	N	1 bottle	0	1,450	0
Total					999,250

The process is summarized in Figure 5 below:

Figure 5: Flowchart showing process of preparing orders



4.1.4. Step 4: Fill in the order form

Using the final costed and adjusted requirements lists, fill in the order form(s).

4.1.4.1. How to fill in an order form

When you are ready to start ordering, have final costed and adjusted requirements lists and the HMIS 085 order form (Figure 6), some blank sheets, a calculator, and a pen on hand. Not all facilities use the HMIS 085 order form but instead they use the order form provided by the warehouse. Any order form will do as long as you fill it in following the steps described in this manual.

4.1.4.2. Order form for essential medicines and health supplies

Transfer the information from your requirements list to a blank order form for EMHS. The form is used to order all medicines and health supplies, including ACTs, laboratory commodities, TB medicines, and RH commodities. Note that the order should only include items permissible for the facility's level of care as listed in the EMHSLU.

Table 8: Fields to complete in an order form

Field on the order form	Action/explanation
Order to warehouse	Specify the name of the supplier
Facility name	Fill in the name of the health facility
District	Fill in the name of the district to which the facility belongs
Level	Circle the level of care of the health facility (HC II, III, IV, or hospital)
HSD	Fill in the name of the HSD to which the facility belongs
Date	Fill in the date
Facility code	Fill in the facility code; on that same line, fill in the year and month; this will guide the supplier in tracking the order made by the health facility
Year	Fill in the year
Month	Fill in the month
Order no.	On that same line, fill in the order number and/or cycle number, which is based on the number of orders made by the facility
Item code	These are found in the supplier's (NMS/JMS) catalogue; fill in this code for each item being ordered
Item description	Fully describe the items being ordered, including the name, dosage form, and strength
Pack unit	Fill in the pack unit of the item being ordered as given in the supplier's catalogue (e.g., for Co-trimoxazole 480, the unit is a tin of 1,000 tabs)
Pack unit price	Fill in the price of each item as reflected in the supplier's catalogue
Quantity ordered	The quantity ordered is obtained by subtracting the current stock balance from the maximum stock level and depends on AMC which is in the stock book
Total cost	Transfer the calculated total cost from your prepared requirement list
Ordered by and signature and date	The person filling in the order form should write his or her name then sign and include date next to the signature
Reviewed and approved by	The health facility in-charge should review and approve the order form by confirming that the cost of the order lies within the facility's budget; the person should write his or her name then sign and include date next to the signature

The final order should be approved by authorized person(s) before being sent to the supplier and a copy kept at the facility. Government lower-level facilities currently receive kits and may order for special supplies i.e., ARVs.

4.1.4.3. Filing the order and the vetted requirements list

For purposes of records keeping, the requirements list and the order must be filled.

4.1.5. Step 5: Updating the commitment register

The commitment register enables you to keep track of how much of the budget has already been spent or committed and how much remains (the balance). "Committed" means that an order has been placed for commodities and will be paid for at some point in the future (e.g., an order submitted to NMS). In other words, a commitment has been made to spend that amount. How to use a commitment register and undertake the financial management involved in ordering EMHS are explained in the Pharmaceutical Financial Management Manual.

Figure 6: Filled in Order Form

HMIS FORM 085: ORDER FORM FOR EMHS					
Order to (NMS, JMS, Other): NMS		Facility Name: Kojja			
District: Mukono		Level: IV			
HSD: Mukono South			Date: 16th May 2023		
Order details: Facility Code: HF0828 Year: 2023 Month: May Order no: 3					
Item Code	Item Description	Pack Unit	Pack Unit Price	Quantity Ordered	Total Cost (UGX)
220 390	Mebendazole 500 mg	1,000	5,300	9	47,700
220 034	Amoxicillin 250 mg	1,000	32,750	9	294,750
220 185	Cotrimoxazole tabs 480	1,000	15,200	23	349,600
220 222	Doxycycline 100 mg	100	2,900	90	261,000
220 640	Paracetamol 500 mg	1,000	7,700	6	46,200
	Total				999,250
Ordered by: Odeke Boniface			Approved by: Dr. Mulwana (in charge)		
Signature & date: 16th May 2023			Signature & date: 18th May 2023		
Confirmed by Dr. Tumushabe DHO Signature & date: 18th May 2023					

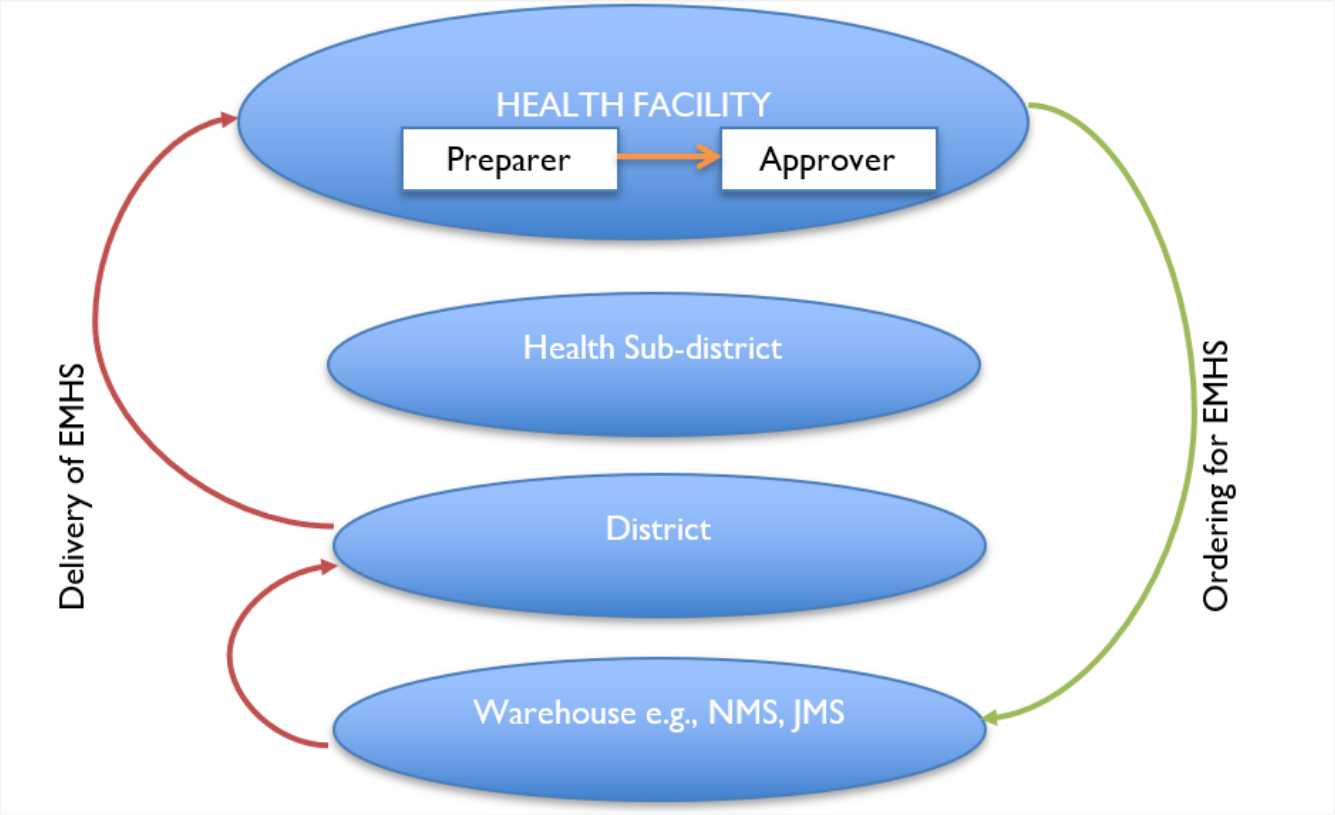
Note: Incomplete orders might be returned to your health facility, causing delays.

4.1.6. Step 6: Completing the order

The summary below outlines the current system of placing orders with central warehouses. Figure 5 below illustrates the process of ordering and delivering credit-line medicines to lower-level health units in the public sector. In summary:

1. The health facility in-charge/approver reviews and approves orders and forwards them to the central warehouse before the specified order deadlines.
2. The central warehouse now ensures "t delivery in accordance with planned delivery schedules.

Figure 7: Movement of Orders for the public health sector facilities



4.2. Emergency Orders

Though not the best practice, prevailing circumstances might dictate the need for placement of emergency orders. Health facility in-charges (HC IVs and above) should contact the central warehouse in writing to explain the situation. HCIIs and HCIIIs should communicate emergency orders to the central warehouse through the DHO's office. The authorities may make arrangements for the facility to be supported by others within the district or in the region. If the facility still has a balance of funds with the supplier (e.g., NMS), arrangements can be made to place a supplementary order outside the normal schedule.

4.3. Ordering and Reporting for Special Program Items

Ordering for RH, ARVs (HMIS-PHAR 017), TB medicines (HMIS-PHAR 026), and HIV test kits (HMIS-PHAR 021) may require more information. It should be filled in at the end of each reporting cycle. At that time, the stores officer, laboratory officer, or any other authorized officer managing the items at the health facility will use stock cards, stock book and dispensing logs to complete the Bimonthly Report and Order Calculation Form. The report and order is sent by the health facility staff to the central level data processing unit on a designated period at the end of the reporting period.

The objectives of this report/order form are to; (i) provide stock on hand balances of items (ii)report bimonthly usage, and (iii) assist planners in determining quantities of commodities to resupply to the health facility. Follow the same principles as described previously when using this form to order RH, ARVs, TB medicines, and HIV test kits.

Table 9: How to Fill in the Bimonthly Order and Patient Report Form HMIS Form 084b

Field Name	Instructions
Facility name:	Write in the name of the facility. Example: Butebo HC IV
Facility code:	where available
Report period:	Write in the beginning day, month, year, and ending day, month, and year of the specified report period following this format: DD-MM-YEAR to DD-MM-YEAR
Health sub-district:	Write in the name of the health sub-district where the facility is located. Example: Butebo HSD.
District:	Write in the name of the district where the facility is located
Date prepared:	Write in the actual date when the form is completed
Item code	Check in the NMS/JMS product catalog and write the item code in this column
Item description	Write the full name of the item to be ordered using the generic name, dosage form, and strength
Basic unit/pack size	By checking the NMS/JMS product catalog, identify and write the basic unit of the item to be ordered
Physical count at the beginning of the review period/Opening Balance	Enter the total number of items that were available at the beginning of the review period. The quantities can be obtained from the stock book by looking at the physical count done at the start of the review period; alternatively, get the figure from the last bimonthly report by looking at the physical count reports at the end of the last reporting period
Quantity received during the two months	Enter the total quantity received by the facility from the official sources of supply (i.e., JMS/NMS) during the two-month reporting period. The quantities of each product received can be found in the quantity received column of the stock card.
Consumption/quantity dispensed during the two months	Enter the total quantity used during the two-month reporting period. The usage data comes from the dispensing log forms. Add up the totals from all the forms for the two months. Repeat the process for each item. You will need to retrieve all the forms you have completed for the two months you are reporting.
Losses/adjustments	Calculate the total losses/adjustments for the reporting period by adding losses/adjustments for the two-month period from the stock card to the losses and wastage from each of the respective dispensing logs for the same period. Enter the total amount of losses and adjustments that occurred during the two months of the report period.
	Adjustments are quantities of a product either issued or received, from any source other than NMS or JMS. For example, you received 100 tests from a local nongovernmental organization (NGO), which would be A + 100 adjustment or you loaned 100 tests to another facility, which would be A – 100 adjustment).
	Losses are quantities removed from your stock for anything other than testing Samples at your facility (e.g., expired, lost, or damaged, recorded as negative number.) If the total amount of the adjustments for the month is positive, write a plus (+) sign next to the number. Example: +3. If the total amount of the adjustments for the month is negative, write a negative (–) sign next to the number.
Number of days out of stock	Enter the number of days the item was out of stock during the 2-month review period. This information comes from stock cards.
Adjusted average monthly consumption (AMC):	Calculate the adjusted AMC by dividing the total quantities used in the two-month period by 60 days minus days out of stock and multiplying by 30 (this could be auto-calculated in web-based ordering) (Quantity consumed during 2 months) X 30 (60 days – days out of stock)

Field Name	Instructions
Closing balance from physical count	This is based on the physical count that is done prior to filling of the bimonthly report/order form. Enter the amount of the physical count in Column 9 marked with F.
Months of stock at hand	Divide closing balance by the adjusted monthly consumption. The result is the months of stock
Minimum stock quantity:	(AMC X 2): Minimum stock level for ALL health commodities is two months of stock
Maximum stock quantity:	Calculate the maximum stock quantity and write this number in this column. The maximum stock level for ALL health commodities is four months. NOTE: Consider the shelf life for laboratory commodities.
Quantity required	Determine the number of packs to be ordered (i.e., the maximum stock quantity less the closing balance/stock on hand)
Remarks	Use this space to explain losses/adjustments or other information on the data being reported.
Prepared by	Write in your full name, signature, designation, phone number, and the date
Reviewed by	The reviewer writes in his or her full name, signature, designation, phone number and the date.
Approved by	The approver writes in his or her full name, signature, designation, phone number and the date

Order forms for special program items also have a section for patient statistics to be filled from the appropriate patients' registers (e.g., TB Unit Register, HIV registers, etc.).

4.4. Electronic ordering and reporting system

This is the electronic system that is used to order and report to the warehouse. This system has some fields that auto-calculate which helps minimize calculation errors. If the facility has computer and Internet access, fields are filled out at facility level and sent directly to the warehouse. The following steps should be followed when preparing and submitting an electronic order.

- Ensure that stock cards, stock book and dispensing logs are up to date. Use this data (e.g., consumption, stock on hand, etc.) to populate appropriate order template (e.g., HMIS PHAR 021).
- The preparer should send the electronic order after filling in the above information in the eLMIS (e.g., CSSP for public health facilities) to the approver.
- The approver reviews the order.
- The approver may approve or reject the order. If the approver rejects the order, it should be returned to the preparer for correction and resubmit to the approver for further review and approval.
- Once approved, it automatically goes to the warehouse.
- It is strongly recommended that the health facility should download, print, and file the approved and submitted order.
-
- KEY POINTS
- Use your up-to-date stock book to prepare the order. Make a requirements list and determine the cost of the requirements using the most recent cost information from the supplier.
- Adjust the order so that you can reduce the total cost to within the available budget. Give priority to Vital items first and then to Essential items.
- Always prepare your order as soon as you conduct the physical count every other month.
- Keep a copy of your order in a file for reference when you receive the items from the supplier.

Figure 8: Bimonthly report & Order calculation form

HMIS PHAR 021: BI-MONTHLY REPORT AND ORDER CALCULATION FORM
Facility Name:…… Report Period:……. District: …….
Month/Year:…….. Health Sub District:……Date pared:……..

1	2	3	4	5	6	7	8	9	10	11	12	13
Item Code	Item Description	Basic Unit	Physical count at beginning of review period	Quantity received during two months	Quantity used during two months	Losses/ Adjustments (+/-)	Number of days out of stock	Closing balance: **physical count**	AMC	Months of stock	Maximum Stock Quantity	Quantity required (J)
			A	B	C	D	E	F	G	H	I	J-1-F
1												
2												
3												
4												

Remarks:
……

(**15) Prepared by: Full Name:**…… Signature:……. Designation:……. Phone No:…….
Date:……

(16) Reviewed by: Full Name:…… Signature:……. Designation:……. Phone No:…….
Date:……

(16) **Approved by:** Full Name:…… Signature:……. Designation:……. Phone No:…….
Date:……

Remarks:
……

5. CHAPTER | 5 | RECEIVING EMHS

5.1. Introduction

This chapter describes how commodities are delivered, the types of documentation accompanying the commodities, the filing system that should be in place, how commodities should be received and checked, and what to do if there are any discrepancies.

It is the responsibility of the health unit management committee to ensure that the commodities listed on the delivery note/invoice is what has been delivered. All discrepancies and complaints should be noted and reported within 7 days to the warehouse.

Central warehouses are responsible for last mile delivery of health commodities to the facilities, and in some cases to the district store where necessary. Warehouses should ensure that the time of delivery of EMHS allows completion of receipt and verification processes by 5.00pm. The central warehouses or their contracted distributor(s) should communicate to the districts and/or facilities the approximate time the truck is likely to arrive at the facility. This enables the facility to organize the designated team to receive the commodities.

5.2. Receiving and Verification Team

It is recommended that the receiving team constitutes; the technical team (Inventory Management Officer, pharmacist or dispenser, and a representative of the health unit management committee and a representative of the local government depending on the facility level of care. For national, regional referral and district hospitals, the receiving team should be composed of pharmacist or dispenser, internal auditor, and a representative of the health unit management committee (HUMC)

The following documents are required during receiving:

- Copy of your order and
- Delivery note/Invoice
- Discrepancy report HMIS PHAR 015
- Complaint form

5.3. Receiving Procedure

1. Before the supplies arrive, prepare space and pallets to store the supplies. Ensure the supplies are for your facility by:
2. Checking the documents delivered with the items to make sure the delivery is for your facility and that the shipment has your facility name code. If the documents are not for your facility, decline to receive the shipment and follow up with the warehouse to find out when you can expect your order.

5.3.1. Checking the delivered boxes

3. Count all the boxes and check that the quantity of boxes corresponds with the quantity recorded in the delivery note/invoice (**Error! Reference source not found.**).
4. Check that the cartons (boxes) are unopened/untampered with.
5. Check that the carton boxes are in good order and not broken. If an item is missing or damaged, it must be recorded on the Discrepancy report HMIS PHAR 015.

5.3.2. Compare order and delivery note/invoice

6. Compare the delivery note/invoice with your approved orders. For facilities receiving kits, compare what has been delivered with the district kit for your level.

5.3.3. Verification Process

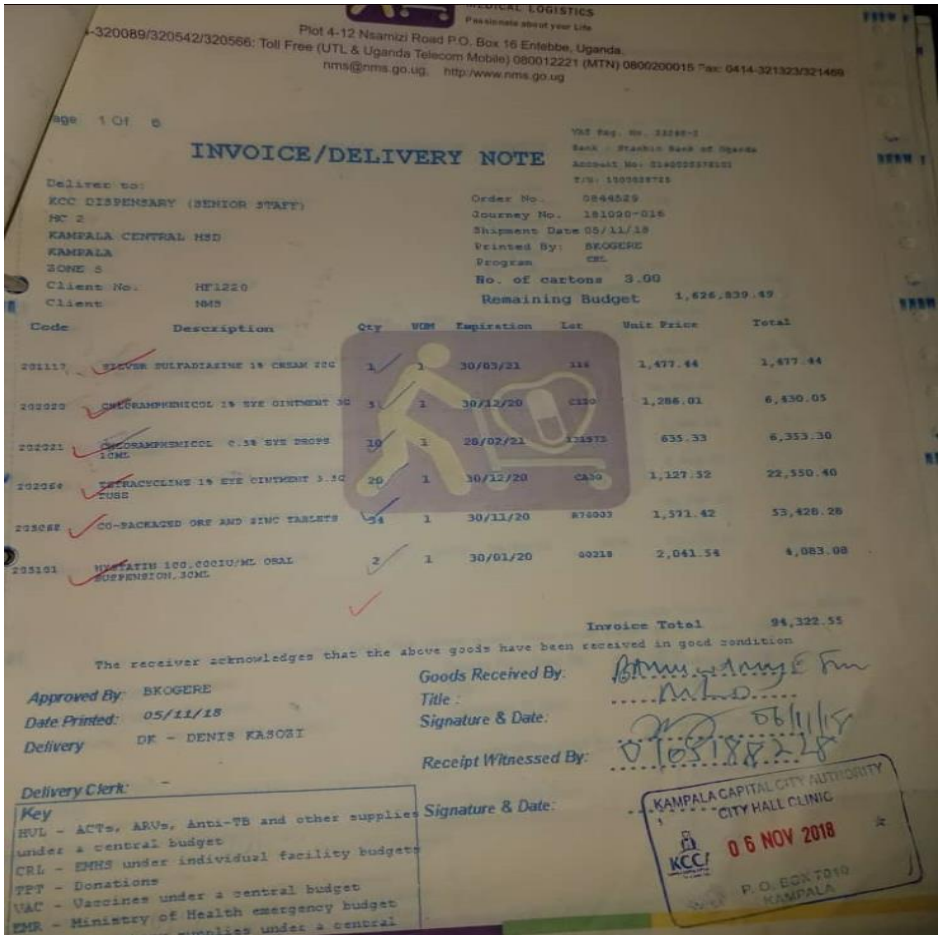
Physical verification will be done when you unpack the delivered items. Opening the boxes and confirmation of content is done in the presence of the delivery team (NMS, JMS, or another contracted supplier).

7. Do a physical count of all items you have received and verify whether they tally with those listed on the delivery note.
8. For medicine kits, the same procedure should be applied because discrepancies between the delivery note, and actual delivery might also occur and NMS should be informed about such discrepancies.
9. For all deliveries, each item needs to be checked off (√) on the delivery note if the received quantity matches the delivery note. You should not check against your order because that has already been done during the document check.
10. Pay special attention to expiry dates and reject items with short expiry dates, particularly if it is unlikely that they will be consumed before they expire (4 months for EMHS and 3 months for laboratory supplies). For any rejected commodities, the health facility has to follow up with the respective supplier for replacement of the rejected items or the facility account should be credited by the warehouse/supplier
11. Always check the packaging materials properly before discarding them. Small items may be hidden in there.

5.3.4. Check physical quality

12. Check items that require cold storage first (e.g., vaccines). If they are not packed in cold packs, DO NOT receive them.
13. Check the colour of medicines, vaccines, laboratory reagents, and test kits. If medicines or vaccines are discoloured, they have deteriorated. DO NOT accept them.
14. Check for broken containers and leaks. Carefully remove broken containers. If there is a leak, remove any supplies damaged by the leak. Fill in the customer complaints form and reject the affected items.
15. Check for unsealed or unlabelled items. Broken seals indicate that items may have been tampered with. It is dangerous to use unsealed and or unlabelled items. DO NOT accept them.
16. Open sealed containers only if you suspect deterioration. Once opened, check the quality.
    a) Check for unusual odours of tablets and capsules—they may have deteriorated.
    b) Check for broken, powdery, or sticky tablets and capsules. Check for cracked or swollen capsules. DO NOT accept any damaged tablets or capsules.
17. Check injectable liquids. Shake the vial and hold it to the light. Clear liquids should have no particles that reflect light. For amber-coloured containers, hold against a white background to check for particles. If a vial has small particles, the medicine has deteriorated.
18. Check the expiry dates for each of the items. ONLY receive items which have expiry of more than four months UNLESS you are confident you can use the quantities of items before expiry. You may receive only quantities that you can consume before expiry. Document this in the customer complaint form. NOTE: The health facility will be responsible for all expiries at the facility.

Figure 9: Example of Delivery Note/Invoice from NMS



19. For any rejected commodities, the health facility has to follow up with the respective supplier for replacement of the rejected items or the facility account should be credited by the warehouse/supplier.

5.3.5. Signing off the delivery

20. If all is okay and there are no discrepancies, the Invoice/delivery note should be signed and stamped by the technical member of staff checking the order, by other members of the designated receiving team and the supplier's representative. You need to write: received date, name(s) and signatures.
21. **If there are discrepancies and/or rejections,** indicate on the invoice/delivery note any discrepancies observed from the box check, the document check, physical check (e.g., if a box is missing, or there were differences in what you received and what is on the delivery note) and if items have been found broken or of poor quality.
22. Then fill in a discrepancy report, which is sent back to the warehouse together with the delivery note. When reporting discrepancies and/or rejections to the supplier/warehouse, you must use the discrepancy and complaints report forms then sign and stamp it.
23. When you have filled in the discrepancy report/customer complaints form, you can sign the delivery note as stated above. (See the next chapter on how to fill in the discrepancy report).
24. Return the original discrepancy report with the delivery note and file a copy. It is important to keep a copy so you can follow up and see that your budget has been changed to reflect the discrepancy.

5.3.6. Discrepancies and/or poor quality items discovered after delivery

If a facility staff notices discrepancies and/or poor quality items in the supplies after the delivery truck(s) have left, fill out the discrepancy form and/or customer complaints form. Alert the facility In-charge or person in charge of procurement of health commodities so that the problem can be followed up with the warehouse/supplier to ensure the missing items are supplied or respective credit note is issued.

5.3.7. Update the stock cards and/or eLMIS

As soon as the delivery note has been signed and the truck has left you should get all your supplies into the storage area and record all the entries on the stock cards and/or eLMIS e.g., Rx solution; if you leave it until later, you may forget to do it.

DO NOT start using supplies from a consignment before the items are entered on their stock cards and/or eLMIS. File all the paperwork, requisitions, delivery notes, and discrepancy reports chronologically and store them for at least five years.

5.3.8. What to do if the ordered commodities are not supplied

When a consignment arrives in the district, but no delivery is made to your facility, make an enquiry with the warehouse and or the DHO/DHC's office. This office will contact the warehouse and notify the facility on the status of the order in question. When required, provide details of the order (e.g., the order numbers and the date the order was placed).

KEY POINTS

To minimize problems encountered during receiving:

- Check the delivery note/invoice and carefully compare them with the consignment sent.
- Check the items and ensure they are the correct quality and quantity.
- Immediately note and report in writing all discrepancies and/or quality issues.
- Fill the discrepancy form and/or customer complaints form where necessary.
- Have an independent person witness all receiving activities.
- Failure to fill a discrepancy report/ complaint form means that the items and quantities on the delivery note were all received by the facility and the facility is responsible for accounting for them.

5.3.9. How to Handle Discrepancies during Deliveries

A discrepancy occurs if there is a difference between what has been received and what is written on the invoice/delivery note or if the items received were not of good quality. This must be brought to the attention of the warehouse (such as NMS, JMS, and others) so the anomaly can be corrected. A **discrepancy report/customer complaint** is used to document the variance and notify the responsible stakeholders including warehouse. Warehouses only accept discrepancy reports within a limited period of time after delivery. i.e., one (1) week for NMS and JMS.

A discrepancy report form should always accompany the delivery note. If the order is satisfactory, there is no need to fill the discrepancy report form.

The following are circumstances under which a discrepancy report form can be filled:

1. Boxes or items are missing or broken.

2. Items delivered but not ordered.
3. Products are of poor quality and have to be returned.

5.3.9.1. Filling in the discrepancy report

Figure 10: Example of a filled in Discrepancy Report (HMIS PHAR 015) shows an example of discrepancy report forms. The order number must be written on the discrepancy report to enable the warehouse to follow up on the report.

Figure 10: Example of a filled in Discrepancy Report

<table>
<tr><td colspan="4">HMIS PHAR 015: DISCREPANCY REPORT</td></tr>
<tr><td>Date : 21st April 2023</td><td>Order No: 3346-06</td><td colspan="2">Delivery note Number:</td></tr>
<tr><td colspan="2">Name Health Facility: Busiu
Level of Health Facility: HC IV</td><td colspan="2">HSD: Bungokho South
District: Mbale</td></tr>
<tr><td colspan="2">Number of boxes on packing list: 69</td><td colspan="2">Number of packs received: 69</td></tr>
<tr><td colspan="4">Details of discrepancy: 200 vials of Lignocaine injection received instead of the 400 vials on the delivery note</td></tr>
<tr><td colspan="4">Details of breakages: NA</td></tr>
<tr><td colspan="4">Details of missing items: NA</td></tr>
<tr><td colspan="4">Details of items received not ordered for: NA</td></tr>
<tr><td colspan="4">Any other item discrepancy</td></tr>
<tr><td>Item Description (name, formulations, strength</td><td>Quantity on Delivery note</td><td>Quantity Received</td><td>Reasons for not receiving right quantity</td></tr>
<tr><td>Lignocaine HCL 2% injection 20ml</td><td>400</td><td>200</td><td>Not delivered in the consignment</td></tr>
<tr><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="2">Client section</td><td colspan="2">Transporter</td></tr>
<tr><td colspan="2">Verified by: Maroha Sarah
Sign: Telephone: 0752 666000
Email:
Date: 21/04/2023</td><td colspan="2">Names of Driver: James Ariho
Vehicle number: UAD 963 V
Sign:
Title: Date: 21/04/2023</td></tr>
<tr><td colspan="4">Comments:</td></tr>
<tr><td colspan="4">To be returned to NMS within 14 days of receipt of supplies</td></tr>
</table>

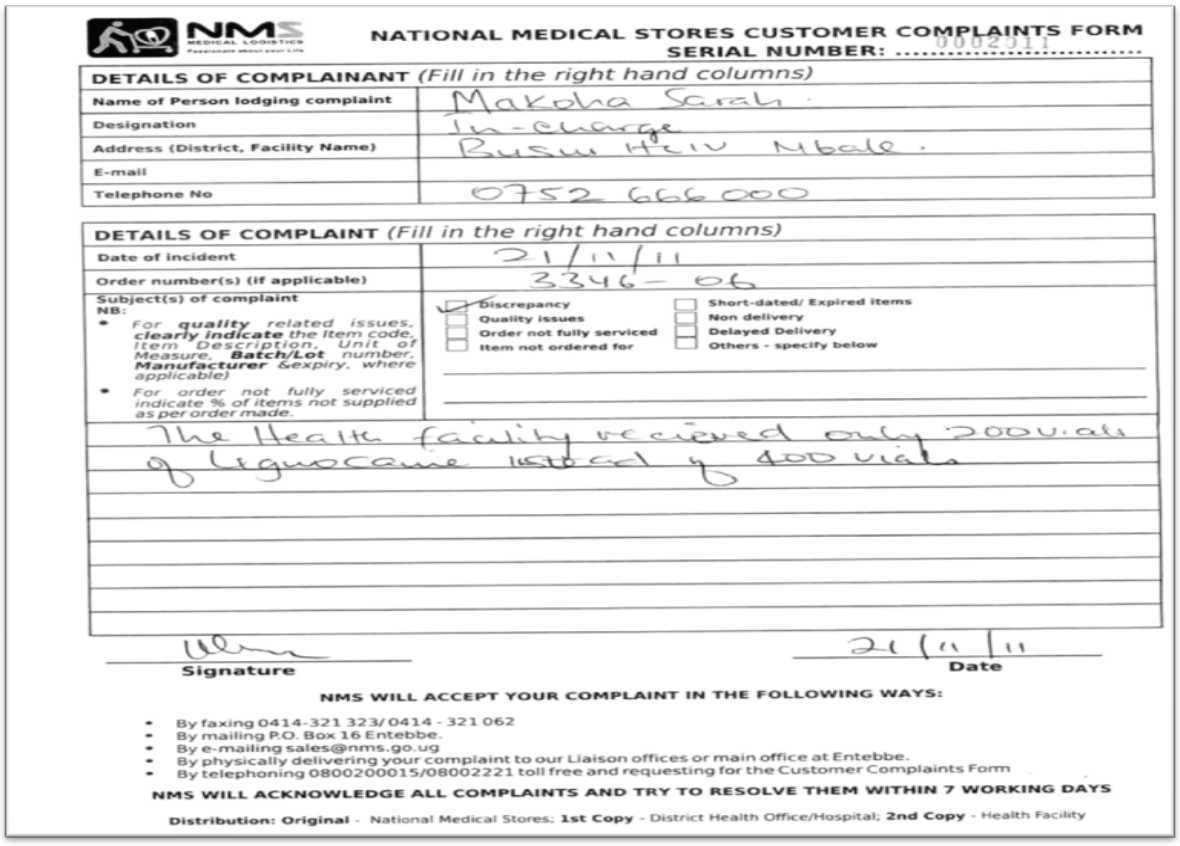
Warehouses will accept return of goods if:

- Warehouse staff has made mistakes in the order processing (i.e., you did not order the commodities).
- Commodities have less than the required shelf life and this fact was not brought to the attention of the customer by the time of delivery.
- EMHS were damaged at the time of delivery.

- Poor quality items were delivered.
- Wrong items and/or quantities were delivered as per the invoice/delivery note.

Below is an example of a filled in "NMS Customer Complaints Form."

Figure 11: Example of a filled in NMS customer complaint form



NMS MEDICAL LOGISTICS

NATIONAL MEDICAL STORES CUSTOMER COMPLAINTS FORM
SERIAL NUMBER: 0002011

DETAILS OF COMPLAINANT *(Fill in the right hand columns)*

Name of Person lodging complaint	Makoha Sarah
Designation	In-charge
Address (District, Facility Name)	Busiu HCIV Mbale.
E-mail	
Telephone No	0752 666 000

DETAILS OF COMPLAINT *(Fill in the right hand columns)*

Date of incident	21/11/11
Order number(s) (if applicable)	3346 - 06
Subject(s) of complaint NB: • For **quality** related issues, **clearly indicate** the Item code, Item Description, Unit of Measure, **Batch/Lot** number, **Manufacturer** &expiry, where applicable) • For order not fully serviced indicate % of items not supplied as per order made.	☑ Discrepancy ☐ Short-dated/ Expired items ☐ Quality issues ☐ Non delivery ☐ Order not fully serviced ☐ Delayed Delivery ☐ Item not ordered for ☐ Others - specify below

The Health facility received only 200 vials of Lignocaine instead of 400 vials.

Signature

21/11/11
Date

NMS WILL ACCEPT YOUR COMPLAINT IN THE FOLLOWING WAYS:

- By faxing 0414-321 323/ 0414 - 321 062
- By mailing P.O. Box 16 Entebbe.
- By e-mailing sales@nms.go.ug
- By physically delivering your complaint to our Liaison offices or main office at Entebbe.
- By telephoning 0800200015/08002221 toll free and requesting for the Customer Complaints Form

NMS WILL ACKNOWLEDGE ALL COMPLAINTS AND TRY TO RESOLVE THEM WITHIN 7 WORKING DAYS

Distribution: Original - National Medical Stores; **1st Copy** - District Health Office/Hospital; **2nd Copy** - Health Facility

Figure 12: Steps to follow when receiving EMHS- a job aid

Steps	What to do	What to pay attention to
STEP 1	Prepare space and pallets	Secure adequate space for opening every box Prevent boxes from direct sunshine and rain
STEP 2	Ensure the supplies are for your facility	Check that the shipment has your facility code If this is not the case, reject the shipment
STEP 3	Ensure the essential documents are at hands	✓ Make sure that you have the following documents: 1. Copy of your order and or procurement plan 2. Delivery note/Invoice 3. Discrepancy report HMIS PHAR 015 4. Complaint form
STEP 4	Check the boxes	✓ Count all the boxes to check if the quantity of boxes corresponds with the quantity recorded in the delivery note/invoice.

Steps	What to do	What to pay attention to
		✓ If there are discrepancies, indicate on the delivery note any discrepancies and fill in a discrepancy report (STEP 8) ✓ Check that the carton boxes are unopened/untampered with, in good order and not broken. If an item is missing or damaged, it must be recorded on the delivery note
STEP 5	Check physical quantities 	✓ Unpack and do a physical count of the deliveries in the presence of a verification team and the drivers. ✓ Every item needs to be checked off (✓) on the delivery note if the received quantity matches the delivery note. ✓ If there are discrepancies, note them on the delivery and fill in a discrepancy report (STEP 8). ✓ Pay special attention to expiry dates and reject items with short expiry dates, particularly any item expiring in four months' time
STEP 6	Check physical quality 	✓ Check the conditions of items. Reject the item if you find any of the following. 1. Cold chain commodities (check this first)_not packed appropriately, 2. Discoloration of vaccines and lab reagents 3. Broken containers, leaks and unsealed or unlabelled items. ✓ If there are unwanted or poor-quality items, note them on the delivery and fill in a discrepancy report (STEP 8)
STEP 7	Signing off the delivery 	✓ Sign the delivery note if all is okay. ✓ Write the received date, Names and signatures by the facility staff person checking the order and by the deliverer are required. ✓ File the invoice and delivery note
STEP 8	Discrepancy Report 	✓ If there are discrepancies, indicate on the invoice/delivery note any discrepancies and fill in a discrepancy report ✓ The discrepancy report known as the warehouse Customer Complaints Form is obtained from the warehouse driver. For JMS, photocopy the HMIS PHAR 015: DISCREPANCY REPORT ✓ Only fill in the discrepancy report form under the following circumstances: ● Boxes or items are missing or broken. ● Items were received that were not ordered or were poor quality. ✓ Write the following information into the discrepancy form: ● Health facility name, District/HSD name ● Number of boxes on packing list ● Number of packs received. ● Details of discrepancy/breakages/missing items/items received not ordered for ● Names and signatures by the facility staff person checking the order and by the deliverer are required.

Steps	What to do	What to pay attention to
		✓ Send the report and delivery note with the damaged items/unwanted items to the supplier (NMS) through the driver and inform the DHO ✓ If any discrepancies are found after the delivery trucks have left, fill out the discrepancy report and send the documents to NMS (for HC II/III, through DHO)

KEY POINTS

- Frequent discrepancy reports indicate a problem with the supplier or transporter, which can only be solved if the problems are reported.
- Health facility staffs are responsible for carefully checking goods received for discrepancies.
- In case of discrepancies, the facility must complete and submit a discrepancy report immediately.
- Make entries on the stock cards/eLMIS immediately after receiving the consignment.
- Discrepancy report, invoice/delivery note must be dated, signed, stamped, file the facility copy and send the other copies to the respective recipients for follow up.

5.4. What to do if the warehouse is out of stock

Always ensure that the facility has optimal stock on hand (stock levels between minimum and maximum), so that the facility will not be immediately affected by stock-outs at the warehouse. Keeping a maximum stock level of four months and topping up supplies when ordering provides a "buffer zone" of stock that averts crisis when NMS/JMS is out of stock for a short time.

When you receive the consignment from a warehouse, and an item you ordered was not supplied, you should still be okay if you have more than your minimum stock of two months, and you just order the item again during the following order period. Using the principles described under the order quantity chapter, the quantity to order will bring you up to a four-month supply. However, if the main supplier continues to be out of stock, you will eventually be affected, and you will need to identify alternative sources for the items. These include:

- Requisitioning the item from other facilities (redistribution; for details refer to CHAPTER |19 | REDISTRIBUTION AND REVERSE LOGISTICS)
- Procuring it from the private sector if the budget allows
- Receiving donations from NGO and other sources

5.4.1. Private Sector Procurement

If the items are not available at the warehouses and cannot be borrowed from elsewhere, and if the DHO/DHC or the facility has funds, you may procure emergency and stocked out items from a private supplier/other source if the budget allows. Use the procurement form 5 to place in an order for such items.

IMPORTANT

1. Only use generic products—the price difference can be enormous.
2. Reserve private procurement for the emergency supply of V (vital) Items only
3. By implementing the stock control system and calculating maximum stock and AMC levels carefully, short-term stock-outs at the main supplier will not cause serious problems.
4. If the supplier's stock-out is long term, you may need to borrow from other facilities. This should be restricted to vital (V) items.
5. Districts and public facilities with funds from sources other than credit line may procure from private sector companies when the main suppliers are out of stock. However, these orders must follow the appropriate procedures. Your supervisors from the district will guide you on how to make the procurement.

6. CHAPTER | 6 | STORAGE

6.1. Introduction

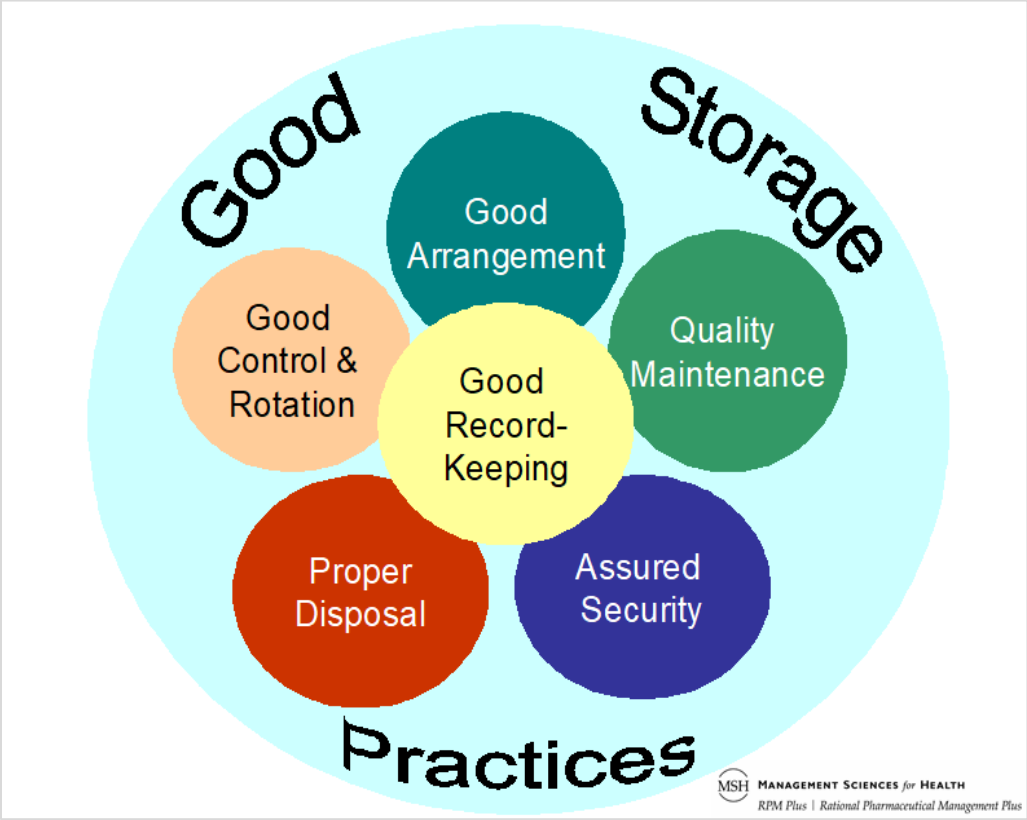
Storage and handling of EMHS in stores should ensure that the conditions recommended by the manufacturer are maintained throughout the supply chain in order to guarantee the quality and safety of the commodities. The key aspects of good storage and distribution include:

1. Appropriate infrastructure
2. Good storage facilities
3. Inventory management
4. Appropriate transport facilities
5. Appropriate Human resources

6.2. Storage of EMHS

Essential medicines and supplies have a specific period of time during which they should be used (shelf life). This is indicated by the date of manufacture and expiry on the item's label. The shelf life indicates the time the item can be used safely if it has been stored under the manufacturer's recommended storage conditions. Essential medicines and health supplies should be stored appropriately in order to maintain their potency and quality. Poor storage can result in deterioration or the development of poisonous degradation products that can be hazardous to the patient.

Figure 13: Factors associated with maintaining good quality of EMHS

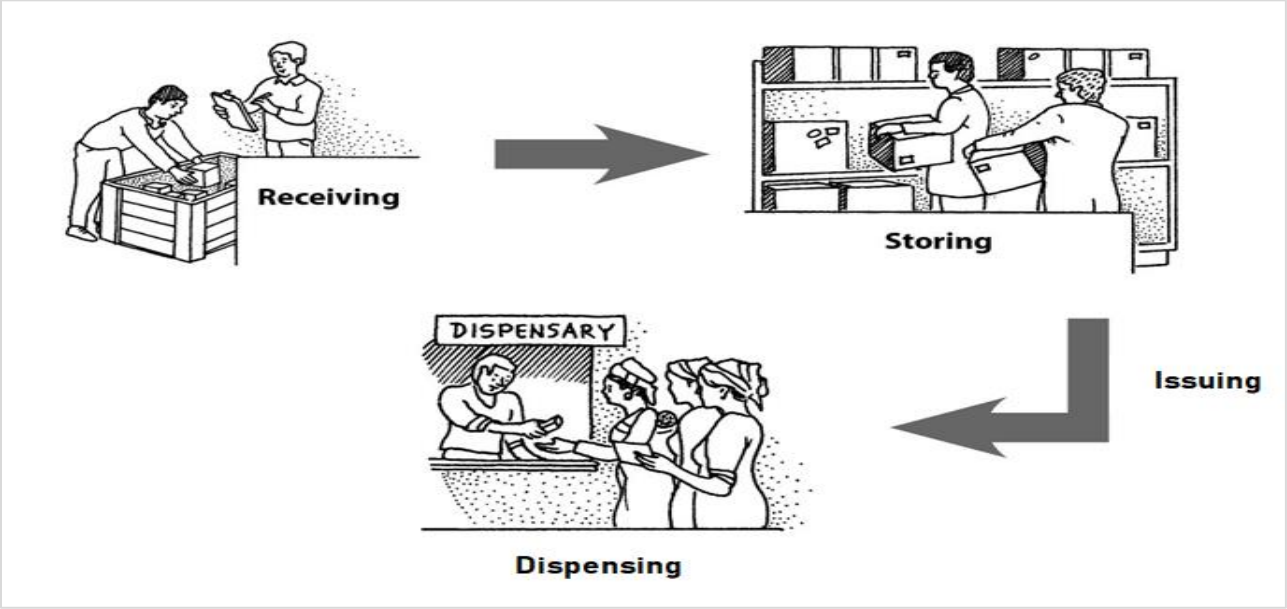


Health workers in charge of medical supplies must monitor and adhere to the storage conditions recommended by the manufacturer. The two most important factors that affect the quality of medicines

and supplies during transit and storage are temperature and humidity. This part of the manual describes how to organize the store and the supplies so that their quality does not deteriorate before use.

- Conduct physical counts of inventories every month or when required to verify inventory records.
- Store health commodities according to their defined categories e.g., flammables, infusions, narcotics, etc. to avoid any accidents and misuse.

Figure 14: Flow of Medicines at the Facility Level



Adapted from RPM Plus Program. Monitoring-Training-Planning Training Materials. Arlington, VA: MSH.

6.3. Organizing the Store

6.3.1. Stock control at all storage areas

Medical supplies should always be kept in a secured, designated storage space because they are very costly and yet very important for any health care service delivery. These items need proper care, or they may deteriorate, resulting in loss of potency or development of poisonous degradation products that might harm patients. Medicines and health supplies should be kept in secure and adequate storage facilities.

It is important to note that proper management of the store and stock records requires that **only one store** should provide medicines and health supplies to all departments in the health facility. Some facilities release supplies to an intermediate store, which then supplies other units. For example, hospital stores issue bulk medicines to the pharmacy, which then issues them again in bulk to the wards, while also keeping a second set of stock cards. The dispensing log shall be used at all dispensing points to track medicines and health supplies given directly to patients. A requisition and issue voucher should be used at all times to record the stock issued out and received from the stores.

IMPORTANT POINTS TO REMEMBER

Keep the following issues in mind when organizing and operating the store:

- Designate a secure room or cupboard at your health facility to be the store.
- Windows must be burglar proof.
- Ensure that there is adequate ventilation and lighting (avoid direct sunlight). Some supplies are very sensitive to light and should be protected from direct sunlight. These include x-ray films, latex products such as condoms and gloves, and certain medicines such as Artemether/Lumefantrine, some TB medicines.
- Separate the store from the dispensing area; do not dispense medicines to patients directly from the store.
- Make a schedule for issuing supplies from the store to user units. Recommended not more than two times a week.
- Designate an area as a receiving and issuing bay where staff remain while waiting for the store personnel to serve them. Non authorized staff should not access the store.
- Every main store should have a class-A (Dangerous Drugs Act - DDA) cupboard.
- There should always be a well-organized and witnessed staff handover at all storage points in the case of change of staff.
- Prevent humidity and spillage of liquids in the storage area as they may cause deterioration of medicines.
- Conduct physical count of inventories every month or where necessary to verify inventory records.
- Store health commodities according to their defined categories e.g., flammables, infusions, narcotics, etc to avoid any accidents and misuse

6.4. Temperature Control

It is important to follow the manufacturer's recommended storage conditions for all products. Some examples of manufacturer's temperature recommendations include the following:

- **Store frozen**: Some products, such as certain vaccines, need to be transported within a cold chain and stored at –20°C.
- **Store at 2°–8°C**: Some products are very heat sensitive but must not be frozen.
- Store at room temperature: Store at 15°– 30°C

The store temperature should not exceed 30°C. Simple measures to make your store cooler are to:

- Make sure the store has a ceiling; ask for assistance from your DHO/DHC to obtain one.
- All storage areas should have windows. Open the windows to allow for aeration during working hours.
- Install air vents and/or a ceiling fan in the store.
- Install thermo-hygrometers in place to monitor daily temperature and humidity. Record temperatures/humidity in the store in the temperature monitoring log in the morning, afternoon, and evening.
- Protect all EMHS from direct sunlight.

6.4.1. Cold Chain Storage

Some items are heat sensitive and require cold chain storage to maintain their quality. These include medicines like oxytocin, insulin, vaccines, and majority of laboratory supplies (

Table 10).

- Use a refrigerator to keep medicines and supplies that require a storage temperature of 2–8°C.
- Ensure that the refrigerator is lockable.
- Never store food or water in the refrigerator with medicines.
- Ensure consistent power supply with a backup.
- Refrigerators that open on the top are more efficient than vertical ones, because hot air rises while cold air falls.
- The coldest part of vertical refrigerators is at the bottom.
    - Store products that are sensitive to freezing or very low temperatures on the upper shelves.
- Always have enough frozen ice packs to transport items requiring cold storage in cold boxes and/or vaccine carriers. Use only ice packs filled with water. Do not use ice packs prefilled with other liquids, which are usually blue or green.
- If there is enough space, place a few plastic bottles of water in the refrigerator. This will help maintain the temperature for a longer period of time if the power is cut off.
- Place refrigerators and freezers with space between and about an arm's length away from the wall. This will increase the air circulation.
- Under ideal conditions, rooms with multiple refrigerators and/or freezers should have air conditioning. Refrigerators and freezers generate large amounts of heat, which can damage the equipment over time.
- If it is not possible to have air conditioning, install fans around the equipment to increase airflow. If installing fans, remember to place the fans so the air also flows in the spaces behind the refrigerators.

Table 10: Examples of Storage Conditions for selected health Supplies:

Reagents	Shelf life	Storage temperature	Packaging
Blood typing sera	24 months	2–8°C	5 mL bottle
Bacteriological media	36 months	21–30°C	500 g bottle
Chemistry reagent kits	12 months	2–8°C or 21–24°C	100 tests per kit
CD4 antibody reagent	≥ 7 months	2–8°C	50 tests per kit
Testing controls	3 months	2–8°C	50 tests per kit
Sickling test (for use)	12 hours	Room temp	As required
Stains, dry powder	60 months	21–30°C	25 mL bottle

Note: Vaccine storage temperatures should be strictly adhered to.

6.5. Protect the store room from water and moisture penetration

Water can destroy EMHS and their packaging. Repair the storeroom so that water cannot enter. Take these steps to control water and moisture in the store by:

1. Making sure there are drainage channels around the outside of the store and gutters with pipes running down from the roof.
2. Repairing all leaks as soon as possible to reduce damage.
3. Stack EMHS off the floor on pallets at least 10 cm high and 30 cm away from walls to prevent moisture that seeps in through walls and floors from making contact with the products. Items should not be stacked more than 2.5 m high or according to the manufacturer's recommendation.
4. Leaving sachets of desiccant (non-edible drying crystals) in containers of tablets and capsules after the containers have been opened; the desiccant keeps the inside of the container free of moisture.
5. Not using products if the inner packaging is damaged because the medicines might have been exposed to humidity and it might have deteriorated.

6.6. Cleaning and Disinfection of the EMHS Store Room

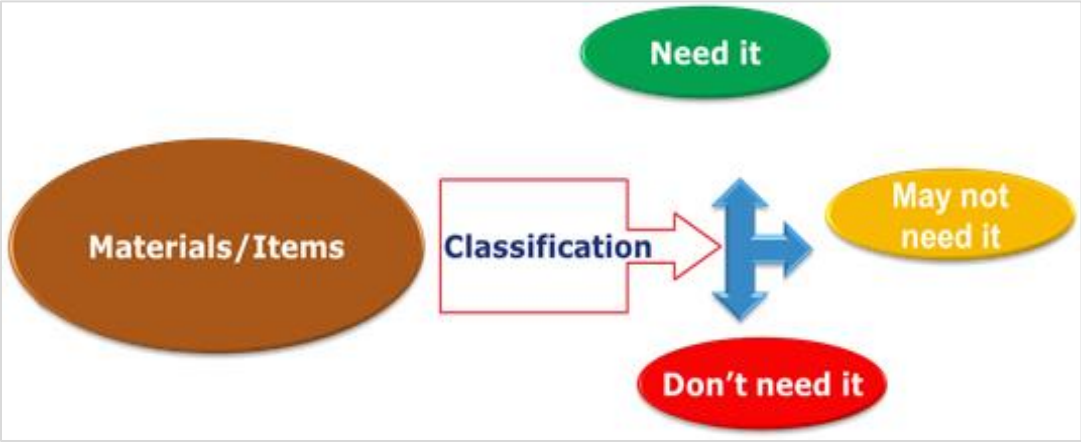
The EMHS storeroom should be arranged according to the 5S approach. 5S is an approach to organizing and managing the store (workspace) and workflow in the store with the intention of improving efficiency by eliminating wastage, improving flow and minimizing unnecessary procedures.

6.7. The 5S steps are: Sort, Set, Shine, Standardize and Sustain

6.7.1. Step 1: Sort

The purpose of this step is to ensure everything that is available is actually needed. Sometimes stores tend to keep items that are no longer usable or required. Assess all items to decide which items your facility needs or does not need and isolate any redundant items. Also, remove unwanted items from the store room regularly to make more space available for storage; for example you may remove or put away unusable EMHS. During this step, any expired, damaged or poor quality EMHS should also be removed (see section on handling expiries). Do not keep broken containers in the store because common pests, such as rodents, ants and wasps are attracted to spilled items like sugary liquids. In addition, keep food and drinks out of the storeroom as these also attract vermin and insects. The store should then subsequently be arranged appropriately.

Figure 15: Sorting of items/materials using 5S



6.7.2. Step 2: Set

After sorting, the objective of the "set" step is to make sure that everything is appropriately positioned. You should therefore organize the store items appropriately; you should have designated locations in

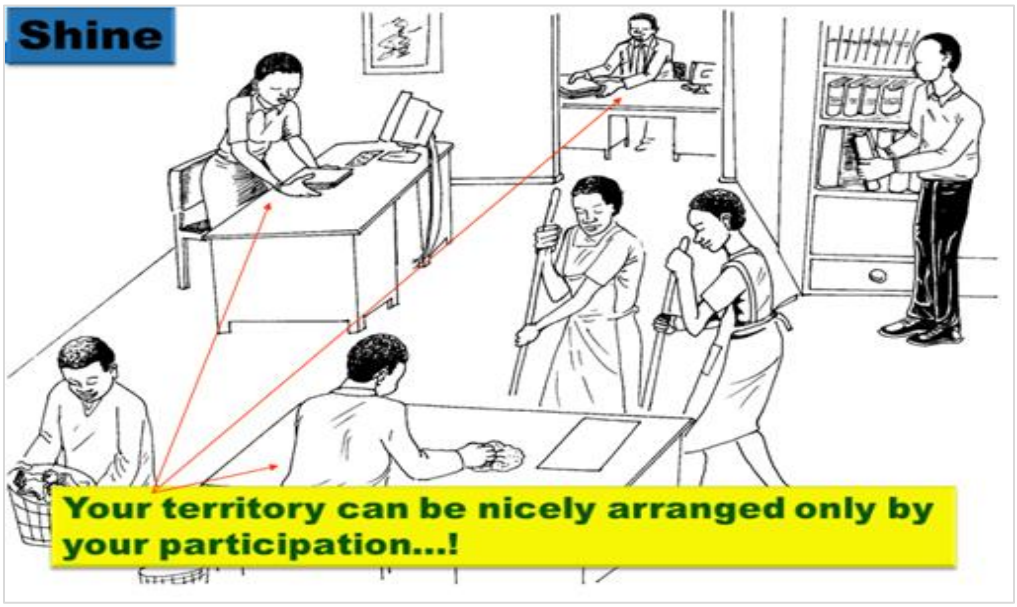
the store for similar items, where 'similar' can refer to route of administration (external, internal or injectable) and type of formulation (powders/creams/syrups/suspensions/solutions etc.). The supplies should then be arranged on the shelves following the preferred arrangement method (e.g., alphabetically, therapeutically, formulation or a combination of more than one method) and the shelves labelled with the name of the item, preferably using the International Nonproprietary Name (INN) of each EMHS. Do not forget to follow FEFO when arranging the medicines and supplies on the shelves and FIFO for those without expiry dates or those with same expiry but delivered at different times.

6.7.3. Step 3: Shine

The purpose of this step is to maintain the store in a neat state. During this step, cleaning is a major component. Clean and disinfect the storeroom regularly to prevent contamination of the EMHS.

1. Set up a regular schedule for general cleaning and disinfection of the storeroom.
2. Sweep and dust the shelves and then floors, then wash with disinfectant or liquid soap.
3. Clean spills properly with detergent without delay and take precautions to prevent insects and pests from entering the store. Pests are less attracted to the storeroom if it is regularly cleaned and disinfected Mechanical devices such as insectocutors (devices used to attract insects and kill them with electricity) and rat traps are preferred so that dead vermin can be easily removed.
4. When dealing with insects and vermin, use rat poisons and insecticides with a lot of caution in order not to contaminate EMHS and prevent personal injury.
5. Make sure to keep the area outside the facility/store clean as well.
6. Keep all bottles and containers closed when not in immediate use.

Figure 16: Shining process of 5S

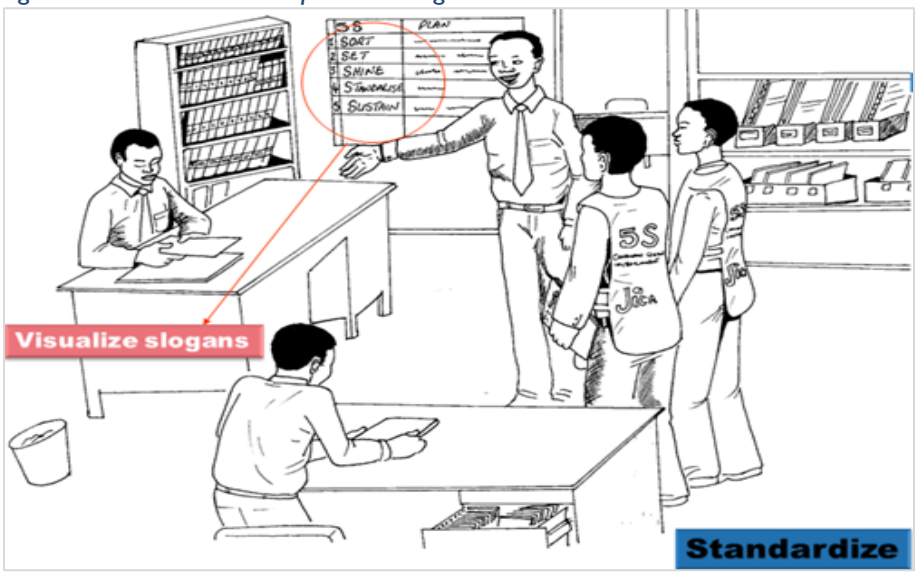


6.7.4. Step 4: Standardize

In this step, you should create a mechanism to maintain the first 3S-steps. These mechanisms can include use of work instructions, standard operating procedures (SOPs) and color-coding or sign boards for workmates to easily understand and replicate the procedures you have instituted. SOPs are written

instructions that document routines or repetitive activities followed by an institution and can be used to ensure that repetitive procedures are done to the required quality.

Figure 17: Standardization process using 5S



6.7.5. Step 5: Sustain

To maintain the good store arrangement, the store staff will need to have self-discipline and undergo periodic training (this may be done as on-job training) so as to maintain the stores management habits, practices and strict observation of stores rules. It may be necessary to display posters promoting the 5S steps done.

Figure 18: Sustaining step, using 5S

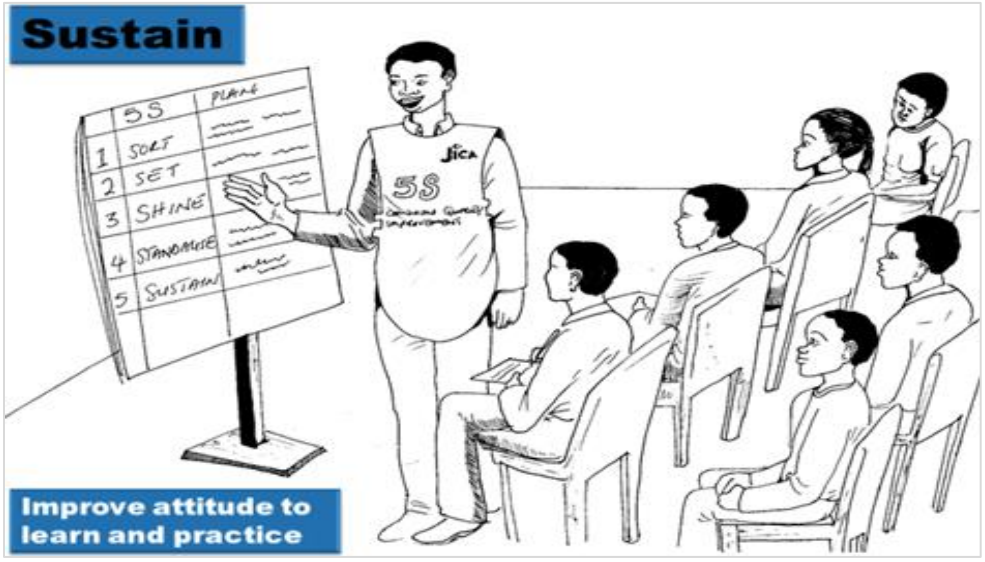


Figure 19: Before and after scenario of a 5S project

6.8. Arrangement of EMHS

- Try to store all medical supplies in one store room. If this is not possible, then keep the same types of medicines or supplies together so that it is easy to know how much stock is on hand.
- When medicines and health supplies are placed in the store, organize them so that finding the items is easy.

Other practices to follow include—

- Store bulky, heavy items and corrosive liquids on the lower shelves and flammable items (e.g., ether and ethanol) in a metal box or cabinet at ground level. Liquids may leak and so any items stored below them might be spoiled.
- Keep your storage system according to alphabetic, formulations, or therapeutic categories.
- Arrange the supplies on the shelves and label the shelves with the generic product names.
- Place each item at its correct label. Arrange items in the order that makes it easy to count, such as pairs or groups of 5s or 10s.
- Following these procedures makes it easy to organize your supplies. It is also easy to see which items are running short.
- Store items according to FEFO (first expiry first out) procedures and the expiry date must be visible. However, FIFO (first In First Out) can apply if items with the same expiry date and batch are received at different times or for items with no expiry dates. Items with earlier expiry dates should be placed in front of those with later expiry dates. Figure 15 shows the rules for arrangement of pallets and shelves.
- When batch and expiry information are on the secondary packaging of a consignment of medicines and not on the primary packaging, do not remove the item from the secondary packaging.

- In the case of liquids, confirm that the containers are upright in the secondary packaging before placing them on the racks or shelving to eliminate accidental spillages as a result of a packing error.

6.9. Safety and Security

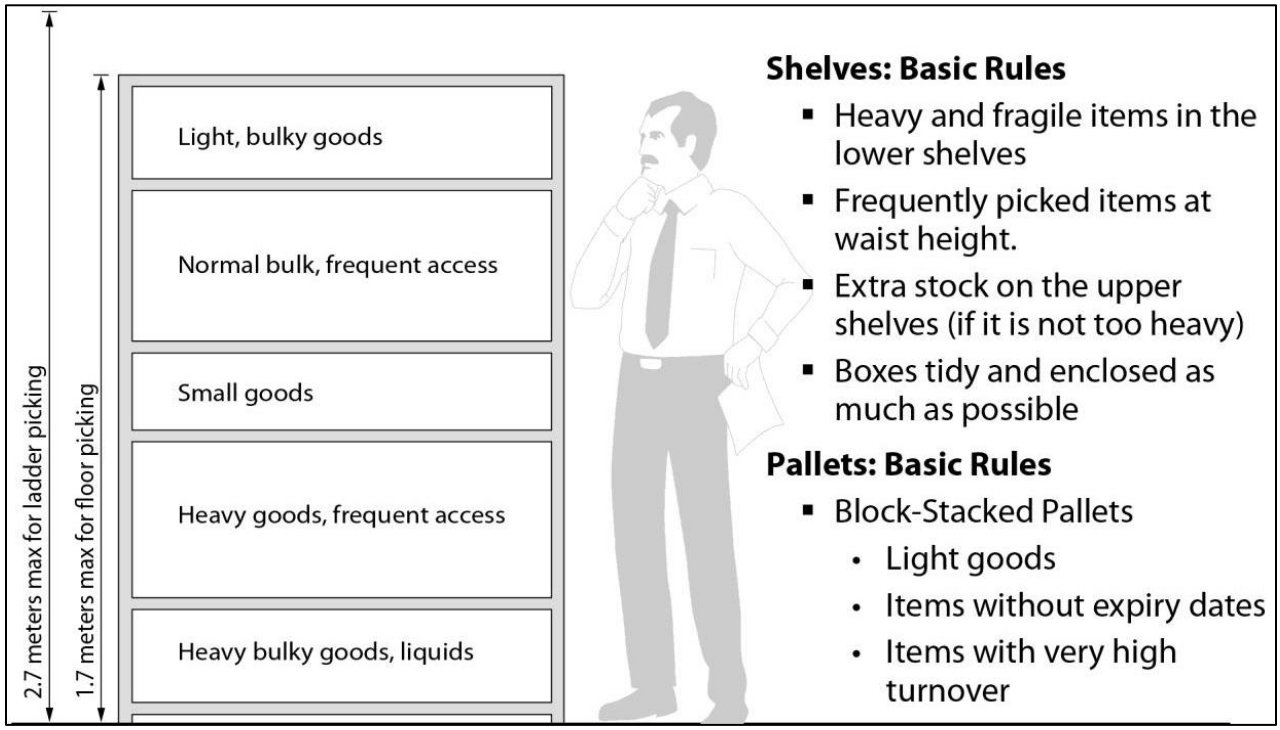
6.9.1. Fire Safety in EMHS store

- Keep fire safety equipment available, accessible, and functional. Train employees how to use firefighting/safety equipment. Keep the following points in mind.
- Take caution to prevent fires. Have caution labels e.g. "No smoking", "Fire assembly points", "Emergency or fire Exit" visibly displayed.
- Place well-maintained fire extinguishers at suitable positions in the store room.
- Keep sand or soil in a bucket nearby if a functional fire extinguisher is not available.
- Organise routine staff trainings on use of fire prevention and safety equipment.
- Store flammable health supplies in their original containers in the coolest possible location and away from sunlight.
- Designate and clearly label fire assembly points.
- Stop a fire before it spreads to save valuable products, minimise facility damages and reduce the chances of injuries.

CAUTION!

Water is **NOT EFFECTIVE** on electrical and chemical fires

Figure 20: Rules for Pallets and Shelves



Source: Ministry of Health and Child Welfare of Zimbabwe, 2006, Managing Pharmaceutical Stock and Ordering, Stock Management Module.

6.9.2. Personal safety in EMHS store

Personal Safety refers to the freedom from any physical harm or threat of physical harm. Workplace safety is very important for each and every employee in the workplace because all the workers desire to work in a safe and protected atmosphere.

Listed below are the measures to ensure personal safety in a drug store.

1. Bulk EMHS should not be put so high to avoid accidents.
2. The floor should always be dry to prevent staff from sliding.
3. Inflammables should be stored away from main storage area of other EMHS to prevent fire outbreaks.
4. Always put on gloves when handling corrosives e.g., sulphuring acid, etc.
5. Always put on a clinical/laboratory coat when accessing the store.
6. Always put on closed shoes when accessing the store.
7. Do not stack more than six layers of boxes
8. Regular training of staff in personal safety protocols.

6.9.3. Security in the EMHS store

6.9.3.1. Limit access to storage area

The storage area should only be accessed by authorized personnel. In addition:

- The room must be locked when no activity is taking place.
- If the stores personnel is to be absent, he/she should ensure proper handover of the stores and keys to the in-charge or other responsible person.

KEY POINTS

- Store medicines in a clean, safe, well-maintained store, protected from heat, light, humidity, and pests.
- Stick to FEFO for those items with different expiry dates and FIFO for items with the same or no expiry dates.
- Remove expired stock to a designated area clearly marked for expired medicines and health supplies.
- Redistribute excessive stock to other facilities.
- Label the shelves with generic names and place each item at its correct label

7. CHAPTER | 7 | REQUISITIONING AND ISSUING SUPPLIES

7.1. Introduction

Issuing medicines and health supplies is the store personnel's regular activity and care should be taken to ensure proper recording of all items taken out of the store. No commodity should leave a store without a requisition from the user unit. Health facilities should always maintain one store where all stock cards and the stock book are kept. All user departments or wards such as the Inpatient pharmacy, Outpatient pharmacy, Theatre, Casualty/emergency, and any other specialized units should request their authorized supplies from the main store using the requisition and issue voucher (HMIS PHAR 020).

User departments should not keep stock cards because their dispensing logs provide all the information needed for accountability and to track consumption. Keeping stock cards up to date and implementing good stock management is time consuming; therefore, the storekeeper should be responsible. Pharmacy staff if available should train the stores personnel in inventory management and in preparing orders.

7.2. Issuing Supplies from the District Store

The district stores personnel should record all the medicines and supplies received for onward distribution to the health facilities. Districts will often receive supplies in the form of kits or sealed boxes destined for specified health facilities. In this case, if the boxes are properly sealed, there is no need to verify the contents in the box, at this point the stores personnel should verify the shipment basing on the Shipment Manifest. The stores personnel should record the delivery note information in the book and prepare to forward the items together with the original papers to their final destination.

There are some circumstances when the district store receives non health facility specific EMHS for example neglected tropical diseases and child days plus EMHS among others. The facility should request for these items from the district stores and the district stores personnel should issue using the requisition and issue voucher.

7.3. Requisitioning and issuing EMHS within the facility

The following are the steps for facility-level stores to take:

1. The health facility should establish a schedule for issuing commodities to the departments within the facility e.g., outpatient department dispensary, antenatal department, TB clinic, and inpatient pharmacy among others.
2. On designated days of the week, user departments should present requisitions for EMHS. The store will then issue products out to the different departments.
3. A regular schedule to issue EMHS at most twice a week allows time for the stores personnel to update records and carry out other store functions.
4. User departments should use HMIS PHAR 020 (*requisition and issue voucher*) to requisition supplies. The form should be filled out in duplicate/triplicate. If the forms are not available, improvised requisitions should still be made in duplicate/triplicate. Stores should only issue against approved requisitions.
5. The requisitions should be approved by the pharmacist/head of the unit as a countercheck.
6. Issues from stores to departments should as much as possible be in packs (e.g., tins of 1,000 tablets) or the smallest original container.
7. When supplies are issued, the person collecting them should check and countersign to acknowledge receipt of the items.

8. The stores personnel should always record the transaction on the stock card before issuing an item out of the store.

7.3.1. Issuing of Health Supplies to other Facilities

Supplying medicines and health supplies to other facilities is sometimes necessary, for example, when other facilities run out of stock or when large quantities of slow-moving items need to be redistributed. For details refer to CHAPTER |19 | REDISTRIBUTION AND REVERSE LOGISTICS.

7.3.2. Using HMIS PHAR 020 - Requisition and Issue Voucher

The delegated person in the user units including the dispensary must fill in a requisition and issue voucher every time they need new supplies from the store (Ref. to HMIS PHAR 020 requisitions and issue voucher – HMIS Manual 2018). Follow the steps below to fill in the requisition and issue voucher.

7.3.2.1. Filling in the requisition and issue voucher

1. **Header information:** Fill in the name of the health unit making the requisition/issuing; also enter the user unit, and date the requisition/issue is made.

7.3.2.2. Filling in the order

2. **Ordered by:** The person making the requisition should write his or her name and sign.
3. **Item code:** Enter the item code of the commodity as written in the National Product catalogue.
4. **Item description:** Enter the full description of the commodity, including name, dosage form, and formulation; for example, quinine dihydrochloride injection 600 mg/2 ml ampoule.
5. **Physical count (current balance):** Enter the quantity of this item currently in stock.
6. **Quantity ordered:** Enter the quantity that your department wants to order**.**
7. **Authorized by:** The in-charge of the department should write his or her name, telephone number and then sign.

7.3.2.3. Filling in the issue

8. **Batch number:** The store personnel should indicate the batch number for the quantity issued above.
9. **Unit cost:** For issues outside the facility, enter the unit cost of the item (this is not applicable for issues made within the facility)
10. **Total cost**: For issues outside the facility, multiply the quantity issued with the unit cost to get the total cost (this is not applicable for issues made within the facility)
11. **Issue date:** Enter the date of the transaction.
12. **Name and signature of issuer:** The issuing officer (store personnel) should write his or her name and then sign.

7.4. Receipt of EMHS from health facility stores

13. **Receipt date:** the person who receives the EMHS should enter the date on which the goods are received.
14. **Name and signature:** Enter the name and signature of the person who received the EMHS.

Before signing ensure that:

- The right items have been issued,
- The quantities are correct,
- The EMHS are not expired,

- Where applicable, cost calculations are correct.

7.5. Electronic Requisitioning and Issuing

Some health facilities are currently using eLMIS (e.g., IHFMS, RxSolution, Clinic Master) for inventory management in their store. For such facilities, the following steps should be followed to requisition and issue stock within the health facility. The following steps should be followed to requisition and issue stock.

- The user department logs in into the eLMIS app.
- Makes a requisition which the system forwards to the approver.
- The approver reviews the requisition. The approver, may approve, reject of edit.
- Once approved, the store is notified and issues accordingly.
- Finally, the stores personnel captures the issues data into the system.

8. CHAPTER | 8 | DISPENSING MEDICINES

8.1. Introduction

Dispensing is the last station in the medicine pathway between the prescriber and the patient, so it is important to do it correctly. The objective of good dispensing is to ensure that the:

1. Right FORM of the
2. Right MEDICINE is given to the
3. Right PATIENT in the
4. Right DOSAGE AND QUANTITY with the
5. Right INSTRUCTIONS and in the
6. Right PACKAGING by the
7. Right HEALTHCARE PROVIDER

Good dispensing practices include having:

- Safe, clean, and organized work environment
- Qualified and trained staff
- Safe and clean dispensing
- Safe labelling and instructions
- Ensure patients understanding
- Good record keeping

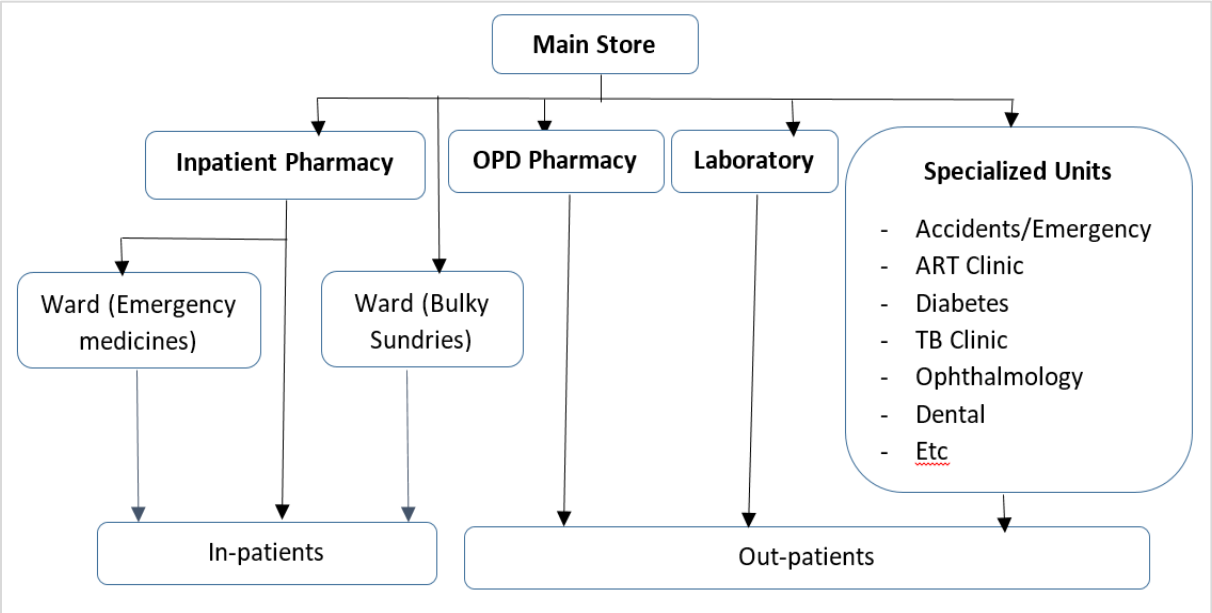
Figure 21 shows the flow of items from store to patients.

8.2. Dispensing Work Environment

The Dispensing environment must be clean because most medicines are ingested. The work area must be hygienic and uncontaminated. The environment must also be organized so that dispensing can be performed accurately and efficiently. The dispensing environment includes:

1. **Staff**: Must be qualified and should maintain good personal hygiene and wear clean protective clothing. Facilities to wash and dry hands should be available.
2. **Physical surroundings**: These must be kept free of dust and dirt so floors and work surfaces should be cleaned daily. The dispensing area should be safe and large enough to allow staff movement.
3. **Shelving and storage areas**: Cupboards should only contain medicines and should be kept tidy and clean. Stock containers (especially in In-Patient Pharmacy), and pre-packed medicines must be stored in an organized way.
4. **Work surfaces**: Spillage of liquids (e.g., syrups) should be wiped immediately. Food and drinks are not allowed in the dispensing area.
5. **Equipment and packing materials**: Dispensing equipment should be used for measuring liquids (measuring cylinder) or counting trays for counting tablets and capsules. Equipment should be cleaned between products, patients and at the end of the day.

Figure 21: Flow of Health Supplies/Sundries from Main Hospital Stores to the patients

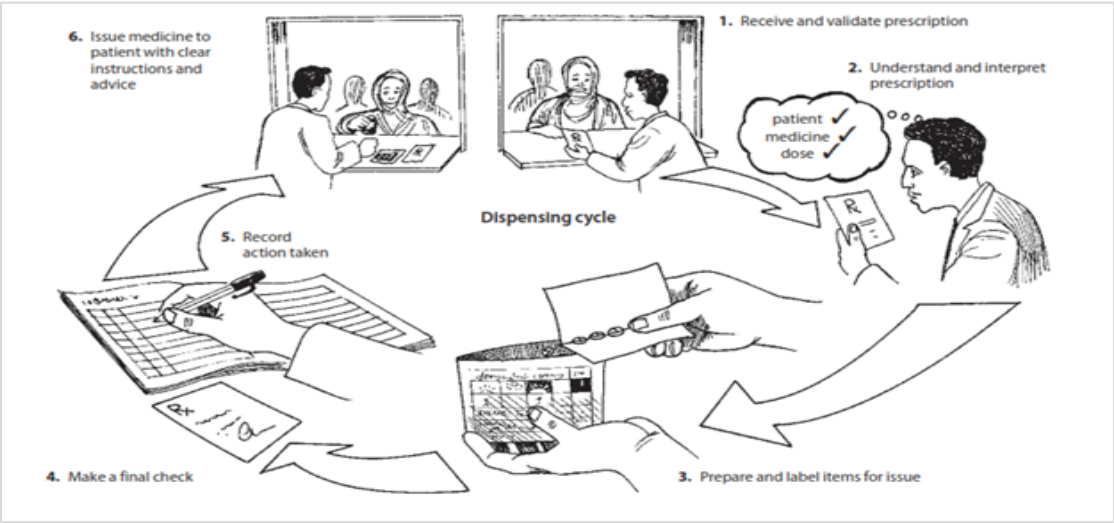


KEY POINT

Very importantly, **ALL** EMHS containers in use must be clearly and accurately labeled with the opening date to minimize error. The repacking of one in a container of another drug should be discouraged and if it needs to be done, the name dosage and batch and expiry date should be clearly indicated.

8.3. Dispensing Procedures

Figure 22: Dispensing cycle



1. Check that the prescription is appropriate for the patient as follows:
   a) Review the prescription.

b) Find the generic name of the medicine. If you cannot read it or if you have any questions about a prescription, ask the prescriber to explain it to you.
c) Check that the prescription is appropriate for the age, weight, and sex of the patient.
d) Where feasible, also check that the medicine prescribed is appropriate in form, strength, and dosage and in line with the standard treatment guidelines for this medicine. If you have any doubt about this, consult with the prescriber.

2. Prepare one prescribed item at a time, do not combine them.
   a) Collect a bottle, strip, tube, or container of the item, and check its expiry date.
   b) Read the generic name on the label of the container.
   c) Check that it is the correct medicine.
   d) Remember that some medicines look the same and can easily be confused.
   e) Check that it is the correct form, strength, and unit size.
   f) Collect a medicine envelope or container to package the item for the patient.
   g) Close the medicine container immediately after use and return it to the shelf.
3. Label the package to be given to the patient.

A clearly written label is important. Some packages will have pre-printed labels on them, others may not have labels and you will need to prepare a label. Write clearly on the label. Include the following information:

- Patients name
- Patients age (if both mother and child are sick)
- Date generic name of items
- Strength
- Dosage Form (e.g., tablets, capsules)
- Quantity dispensed
- Expiry date
- Dose (Use pictures or numbers)
- Instructions which tell the patient when, how much, for how long and how the medicine should be taken. Include written instructions also. Patients who cannot read may need pictures for instructions and should be assisted to understand the instructions.

4. Quality checks on the medicines

Open the medicines container and check the quality of its contents.

- If medicines have an odd smell, they may have deteriorated. If tablets or capsules are cracked, broken, powdery, or sticky, they are damaged. Refer to the Pharmacopeia to get details about that product to prove that it's damaged or spoiled.
- Never give patients poor quality medicines. Dispose of those medicines properly.

5. Count the quantity needed in a clean and safe manner
   - Count tablets or capsules using a clean counting tray with a clean spatula/spoon. Keep the tray clean.
   - Do not use your hands to count medicines. You may contaminate both the medicine and your hands.
6. Put correct amount of the medicine into the package for the patient to take home.
   - Put the medicine into its own labelled package using the tray and spatula (or measuring device for liquids).
   - Do not mix prescriptions or medicines of different patients even if they are from the same family.
7. Close the containers from which the medicines were picked.
8. Dispense one item at a time if the patient has more than one medicine.

9. Tell the patient to repeat the instructions to assess their understanding of the prescriptions.
10. Sometimes patients will feel better before they finish all the prescribed medicines. Tell patients that, even if they feel better, it is important to take all the medicines to stay well. This is especially true of antibiotics or anti-malarials because bacteria or parasites may still be present. Also tell patients with chronic conditions, such as those with hypertension or those taking ARVs that they need to return for review or follow up on the stated dates.
11. Record the medicines in the dispensing log (HMIS PHAR 003)
12. Caution patients not to share medicines belonging to one patient with others who seemingly have the same signs and symptoms.

Figure 23: Steps to follow during dispensing of medicines- A job aid

Steps	What to do	What to pay attention to
STEP 1	Check the prescription 	Check that contents of prescribed treatment is correct considering: • Indication and UCG recommended treatment. • Form, strength, and dosage of medicine is right for the patient (e.g., child dosage and syrups for children)
STEP 2	Prepare the medicine 	• Make sure you use the right medicine. Check name and strength on the container label. • Check quality of the medicines. Do not use cracked or broken tablet. • Count correct quantity using gloves or counting tray and spatula/spoon. DON'T USE BARE HANDS!
STEP 3	Double-check information and counting 	If more than one staff in dispensary • Preferably another person should double-check STEP 1 (prescription) and STEP 2 (medicine preparation). If one person in dispensary • Check again to ensure that you have picked the right medicines as prescribed. • Check again to ensure that you have counted correctly.
STEP 4	Dispense the medicines	• Use a dispensing envelope or small bottle. • Label the package clearly with patient's name, facility name, generic name, strength and quantity of medicine, dose, and duration.
STEP 5	Provide appropriate information patient 	Ensure that the patient has understood: • Why to take medicine • How to take i.e., oral, or topical • When to take (morning, midday and/or evening) • How much of the medicine to take (number of tablets or ml) • How long to take (until all tablets are used or number of days) • Information about interaction (patient must know which food or medicine affects the effect of the medicine) • Information about side effects (patient must understand that side effects can occur and know when to continue or stop treatment and return to the doctor. General information i.e., dose should be taken in full and not shared

Steps	What to do	What to pay attention to
STEP 6	Record in the prescription and dispensing log	• Fill in date, patient number/name, diagnose, medicine name, initials of prescriber and dispenser

8.4. Outpatients Department pharmacy

Medicines shall be issued from store to the outpatient pharmacy where they are dispensed to outpatients based on the prescriptions and recorded into the daily dispensing log (HMIS PHARM 003). Information in the dispensing log will include:

1. Health Unit Name.
2. Date
3. Department
4. OPD/IPD number.
5. Names and quantity of medicines dispensed.
6. Initials of dispenser and prescriber.
7. Balance Brought Forward
8. Amount Received
9. Balance at Hand
10. Total Quantities of medicines dispensed.
11. List of prescribers with their names and signatures shall be availed in the outpatients' department pharmacy.
12. Authenticity of prescription must be verified.

For supplies that are not patient specific and needed for normal operations of the ward e.g., cotton, gloves, plaster, disinfectants or as determined by MTC will be issued from store to user units using the requisition and issue voucher. The health supplies will be documented into the dispensing log using the smallest issue unit e.g., one roll of gauze, one piece of cannula.

For supplies that are patient specific e.g., Cannula, giving sets, catheters or as determined by the MTC may be issued to Inpatient pharmacy from the main store using requisition and issues voucher. The health supplies are dispensed as per chart and recorded into the dispensing log.

8.5. In-Patient Pharmacy

All health facilities that have in-patient services are required to establish and operate an inpatient pharmacy where essential medicines and selected health supplies are dispensed per treatment chart and given to patients or their caretakers for safe custody. This section describes how EMHS are requisitioned from the stores by user departments, documented and dispensed from the in-patient pharmacy/dispensing points.

Figure 24: HMIS 016: Daily Dispensing Log

HMIS PHAR 003: DAILY DISPENSING LOG

(1)Health Unit Name:...

(2) Date	(3) Department	(4) OPD/IPD Number	(5) Names and quantity of medicines dispensed																														(6) Initials	
																																	(a) Prescriber	(b) Dispenser / Nurse (IPD only)
(7) Balance Brought Forward																																		
(8) Amount Received																																		
9) Total dispensed																																		
10) Balance at hand (B/F + amount Received -Total Dispensed)																																		

11). Comment:...

....

(Print Version September 2019)

8.5.1. Dispensing to the patients

The location and layout of the inpatient pharmacy may vary among the health facilities depending on the infrastructure and space available. It is recommended that it is located in a central place where most wards/units have easy access.

The following should be considered when dispensing:

1. All the medicines in the in-patient pharmacies must be accounted for by use of dispensing log.
2. All medicines shall be dispensed to the inpatients using a treatment sheet with a valid prescription having the following features:
   - Date
   - IPD number
   - Patient name
   - Dose and duration of medication
   - Name and quantity of medicines dispensed
3. The pharmacy in-charge/nurse on duty shall be responsible for making sure that medicines prescribed to the patients are collected from the in-patient pharmacy.
4. All prescribers shall submit their specimen signatures to the in-patient pharmacy and all other dispensing points.
5. All treatment charts received must be reviewed by the Pharmacist/ dispenser to ensure that they meet following criteria:
   - Authenticity of treatment chart
   - Adherence to UCG
   - Suitability of dosing regimen
   - No drug interactions
   - Appropriate route of administration and frequency

5. Dispensing of the prescription shall be done by the Pharmacist/dispenser, all medicines supplied must be in suitable containers meant for administration daily but not exceeding 72 hours (3 days).

8.5.2. Documentation

1. Dispensed medicines shall be documented in the dispensing log clearly indicating.
   - Name, strength and quantity of medicine dispensed.
   - IPD number.
   - Initials of dispenser.
   - Initials of prescriber.
2. The quantities of EMHS dispensed is indicated in the treatment chart.

8.5.2.1. Handling of medicines in the ward

1. When in the ward, the medicines dispensed from the pharmacy shall be handed to the patients/caretakers for custody.
2. The nurse on duty shall then provide medication counselling to the patients on;
   a. How to store their medicines adequately.
   b. How to take their oral medications.
   c. What happens to the medicine at discharge?
3. One treatment chart shall be allotted per patient; each will be filled with the medication prescribed with the correct quantity based on the treatment sheet and in accordance with the administration times.

4. During administration of medicines to a patient, the nurse on duty shall counter sign in the treatment chart against the unit dose administered.
5. If discontinuation of patient medication is inevitable before its complete duration, the prescription in the treatment chart shall be cancelled and countersigned by the doctor and a new prescription updated in the treatment sheet.
6. The withheld medicines shall be returned to the pharmacy to determine whether it can be reused or destroyed. In both cases, proper documentation should be done.

8.6. Emergency Medicines

Emergency medicines should be dispensed from the emergency cupboard in the wards/units. Wards/units are recommended to securely keep a limited quantity of lifesaving medicines in the medicines cupboards e.g. Adrenaline, oxytocin, dextrose 50, diazepam or as determined by the MTC. The emergency medicines list and the quantities to be supplied should be customized for each ward as approved by the MTC. The stock should be refilled on a top up basis according to the consumption data reflected in the dispensing log.

Ordering of emergency medicines for the wards shall be done by the nurse on duty or ward in-charge using requisition and issue voucher form (HMIS PHAR 020) that should reflect the stock on hand (balances in the cupboard).Upon authorization, by the head of department/unit in-charge the HMIS PHAR 020 is sent to the inpatient pharmacy for sanctioning by the in-patient pharmacy in-charge/dispenser and medicines or health supplies will be issued.

Ward inspections shall be done to ensure the following:

1. Ward stocks comply with the amounts approved.
2. FEFO/FIFO is being adhered to.
3. Medicines are available and are in good condition.
4. Documentation into the dispensing log and treatment sheets are properly done.
5. FEFO can be applied in case of withdraw of items which have short expiry dates.

8.7. Accident and Emergency Department

Accident and Emergency (AE) room is a section in the hospital that provides rapid and varied emergency treatment to patients. It's usually the first point for patients who arrive in the hospital at any time even during the night/after working hours. Supplies should be requested from inpatient pharmacy or stores using requisition and issue voucher as described above and recording in the dispensing log. The supplies should be dispensed as per treatment chart and documented in the dispensing log as well as updating the stock cards. The next refill of the prescription should either be done in the inpatient pharmacy (if the patient is admitted) or outpatient pharmacy (if the patient is not admitted).

8.8. Special Units Pharmacy

These are units offering specialized inpatient and/or outpatient services for the case of regional referral hospitals and lower health facilities. These patients require special considerations for most of or all their needs. The EMHS should be requested from stores using requisition and issue voucher, dispensed as per treatment chart, and documented in the dispensing log as described in inpatients section above.

8.9. Narcotic and psychotropic drugs

All medicines with a potential of abuse require strict observation that they should be dispensed under witness of a second person and where necessary the dispensing recorded in both the dispensing log and Narcotics drugs book. For injectable narcotic drugs, empty vials/ampoules/containers must be returned to the inpatient pharmacy to confirm usage.

8.10. Medical supplies

Supplies that are not patient specific and needed for normal operations of the ward e.g., cotton, gloves, plaster, disinfectants or as determined by MTC will be issued from store to user units using the requisition and issue voucher. The health supplies will be documented into a dispensing log using the smallest issue unit e.g., one roll of gauze, one piece of cannula.

NOTE

Supplies that are patient specific e.g., cannula, giving sets, catheters or as determined by the MTC may be issued to Inpatient pharmacy from the main store using requisition and issues voucher, dispensed as per chart, and recorded into the IP pharmacy dispensing log.

9. CHAPTER | 9 | MANAGEMENT OF MEDICAL OXYGEN AND RELATED SUPPLIES

9.1. Introduction

Oxygen is a lifesaving essential medicine with no substitution. It is used to treat all-cause Hypoxemia i.e., low concentration of Oxygen in blood (SpO2<90%). There are over 20 known disease conditions causing Hypoxemia according to the UCG. This chapter focuses on strengthening Oxygen health supply chain management, including availability and utilization of medical Oxygen and its supplies, Oxygen distribution, coordination mechanisms, data visibility on Oxygen and related Commodities.

The common sources of Medical Oxygen include Pressure Swing Adsorption (PSA) plants, Liquid Oxygen (LOX) tanks, and concentrators. Depending on the source and production method, WHO recommends the following purities of Medical Oxygen:

- Liquid Oxygen: not less than 99.5%
- PSA plants: not less than 90%
- Oxygen concentrators: greater than 82%

Oxygen logistics and supply chain management is identified as a key driver in reducing Hypoxemia related morbidity and mortality in Uganda as shown in Figure 25.

9.2. Oxygen Supply Chain Map

9.2.1. Essential Oxygen Product List

The essential Oxygen product list comprises the full list of commodities used together to ensure delivery of Oxygen to patients as indicated in the hypoxemia management guidelines in the UCG. There are 4 main categories:

1. Medical Oxygen
2. Oxygen Patient Consumables
3. Oxygen Device Consumables
4. Medical air and its supplies.

Figure 25: Oxygen logistics and supply chain management

Figure 26: Oxygen supply chain map

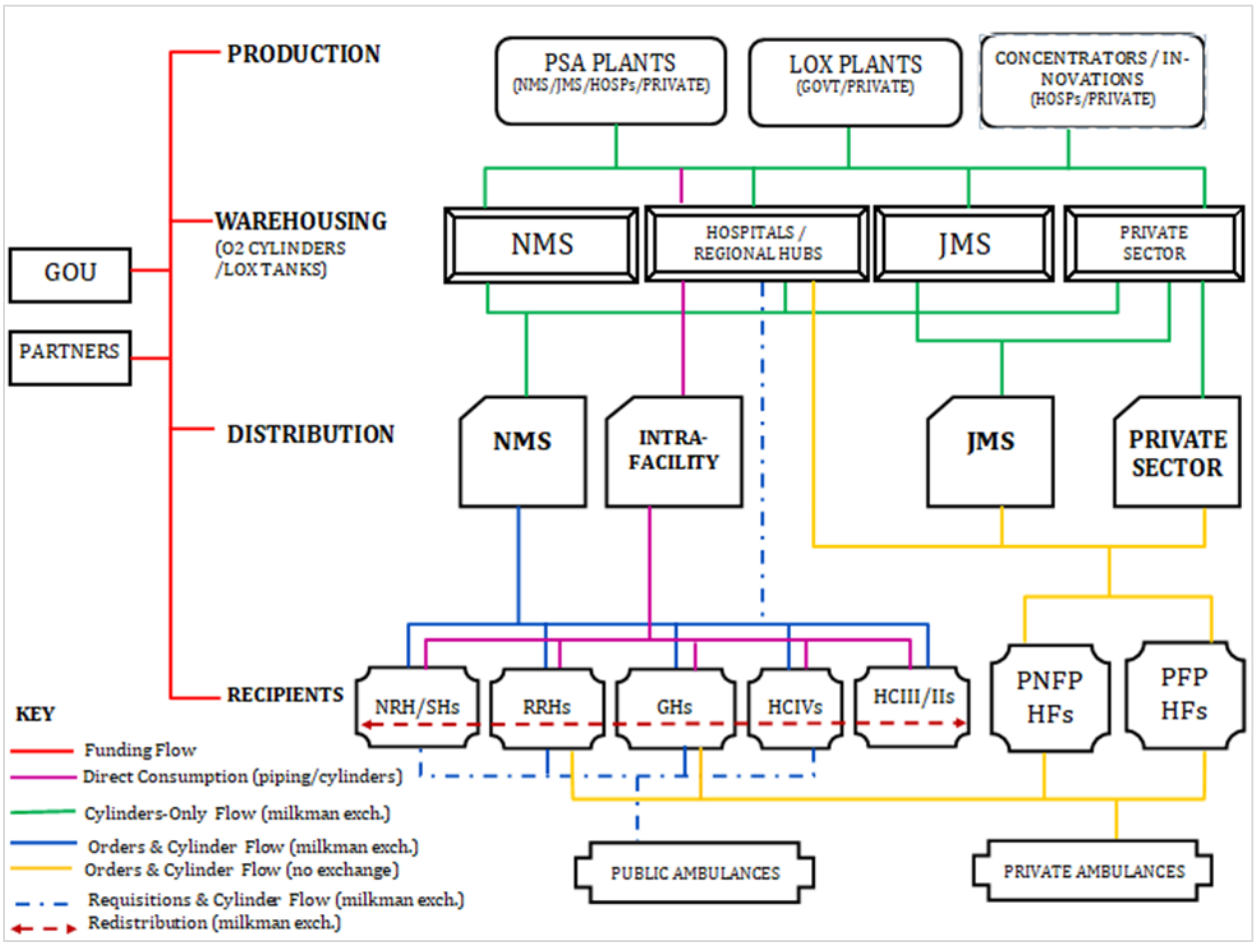


Table 11: Essential Oxygen Product List with recommended LoC and VEN classification

Product Description	UOM	Min. LoC	VEN
Medical Oxygen			
Medical Oxygen Gas 83.0 - 99.9% purity (source dependant)	litre / 6.8m3cylinder	HCII	V
Cylinder Oxygen (bedside/manifold) 40-60+L/6.8m3 WC/GC (big)	litre / 6.8m3cylinder	HCIII	V
Cylinder Oxygen (bedside/manifold) 20-39L/3.5m3 WC/GC (medium)	litre / 3.5m3cylinder	HCIII	V
Cylinder Oxygen (ambulance) 10-19L/1.36m3 WC/GC (small)	litre / 1.36m3cylinder	HCIV	V
Cylinder Oxygen (transfer) 1-9L/0.68m3 WC/GC (portable)	litre / 0.68m3cylinder	HCIII	V
Concentrator Oxygen 5 LPM	litre	HCIII	V
Concentrator Oxygen 10 LPM	litre	HCII	V
Concentrator Oxygen 15 LPM	litre	HCIII	V
Concentrator Oxygen 20 LPM	litre	HCIII	V
Oxygen piped in Cylinder-Manifold system	litre	HCIV	V
Oxygen piped direct from PSA plant	litre	RRH	V

Product Description	UOM	Min. LoC	VEN
Oxygen piped direct from Cryogenic tank (LOX)	litre	RRH	V
Oxygen piped in Low pressure systems/other innovations	litre	HCIII	V
Oxygen Patient Consumables			
Nasal prongs/cannula (neonatal) 1-5LPM flowrate	piece	HCII	V
Nasal prongs/cannula (paediatric) 1-5LPM flowrate	piece	HCII	V
Nasal prongs /cannula (adult) 1-5LPM flowrate	piece	HCII	V
Simple face mask 5-8LPM flowrate, paediatric	piece	HCIII	V
Simple face mask 5-8LPM flowrate, adult	piece	HCIII	V
Partial rebreather mask 6-10LPM flowrate, adult	piece	HCIII	V
Partial rebreather mask 6-10LPM flowrate, paediatric	piece	HCIII	V
Non-rebreather mask 10-15LPM flowrate, adult	piece	HCIII	V
Non-rebreather mask 10-15LPM flowrate, paediatric	piece	HCIII	V
Face tent/shield 10-15LPM flowrate	piece	RRH	E
Venturi mask (with kits) color coded valves/flowrate	piece	HCIV	E
CPAP mask variable flowrate	piece	HCIV	E
CPAP nasal prongs/cannula, paediatric	piece	HCIV	V
CPAP nasal prongs/cannula, adult	piece	HCIV	V
Nebulizer mask (with chamber) variable flowrate	piece	HCIV	V
Airway pieces (oropharyngeal/guedel airways) size 0	piece	HCIV	V
Airway pieces (oropharyngeal/guedel airways) size 1	piece	HCIV	V
Airway pieces (oropharyngeal/guedel airways) size 2	piece	HCIV	V
Airway pieces (oropharyngeal/guedel airways) size 3	piece	HCIV	V
Airway pieces (oropharyngeal/guedel airways) size 4	piece	HCIV	V
Airway pieces (oropharyngeal/guedel airways) size 5	piece	HCIV	V
Ventillator breathing circuits, neonatal	piece	RRH	V
Ventillator breathing circuits, paediatric	piece	RRH	V
Ventillator breathing circuits, adult	piece	RRH	V
Nasal catheter, 8Fr	piece	HCIV	E
High flow nasal cannula	piece	RRH	E
Tubing for Oxygen supply	piece	HCII	E
Oxygen Device Consumables			
Cylinder adjustable spanner	piece	HCII	V
Cylinder key	piece	HCII	V
Oxygen regulator, cylinder mounted	regular	HCII	V
Pulse Oximeter (handheld)	oximeter	HCII	V
Humidifier bottle (cylinder/concentrator)	bottle	HCII	V
Concentrator gross particle filter	set	HCII	V
Concentrator bacterial particle filter	set	HCII	V

Product Description	UOM	Min. LoC	VEN
Humidifier bottle (ventilator)	bottle	RRH	V
Pulse oximeter probe (neonatal)	piece	HCII	V
Pulse oximeter probe (paediatric)	piece	HCII	V
Pulse oximeter probe (adult)	piece	HCII	V
HME filter, adult	set	RRH	V
HME filter paediatric	set	RRH	V
Medical Air			
Medical Air	litre	GH	E
Cylinder Medical Air	litre	GH	E
Medical Air piped in Cylinder-Manifold System	litre	GH	E
Medical Air piped direct from PSA plant	litre	RRH	V

9.2.2. Medical Oxygen Quantification

The **morbidity method** is the most suitable approach for quantification of Medical Oxygen during annual procurement planning. Since Medical Oxygen has several sources, i.e., cylinders, concentrators, and piped oxygen, among others, the use of the consumption method to quantify Oxygen is too complex to provide a reliable value.

The basic formula for Medical Oxygen quantification is as follows:

$$Quantified\ oxygen\ (in\ Litres) = Average\ Flowrate\ (LPM) \times AverageLength\ of\ Stay\ (Minutes) \times No.\ of\ cases$$

The value for Average Flow Rate per case will be determined from the Hypoxaemia management guidelines in the UCG. See Table 12 below.

Table 12: Average flowrate per hospital department

Department	Flow Rate Range	Average Flowrate
OPD	1-10 LPM	5 LPM
Emergency (A&E)	1-12 LPM	6 LPM
Female Medical	1-10 LPM	5 LPM
Male Medical	1-10 LPM	5 LPM
Paediatric	1-12 LPM	6 LPM
Neonatal	1-10 LPM	5 LPM
Maternity	1-20 LPM	10 LPM
General	1-10 LPM	5 LPM
Operating Theatre	1-10 LPM	5 LPM
ICU	1-40 LPM	20 LPM
HDU	1-30 LPM	15 LPM
Ambulance	1-12 LPM	6 LPM
HDU-UCI	1-30 LPM	15 LPM

Department	Flow Rate Range	Average Flowrate
Male Surgical	1-10 LPM	5 LPM
Female Medical	1-10 LPM	5 LPM
Obs and Gyn	1-10 LPM	5 LPM
Eye	1-10 LPM	5 LPM
TB ward	1-10 LPM	5 LPM
Nutrition	1-12 LPM	6 LPM
Orthopaedics	1-10 LPM	5 LPM
Isolation	1-30 LPM	15 LPM
Grand Average		8 LPM

Values for Average Length of Stay and No. of Cases are obtained from patient registers and submitted through the HMIS105B report on Hypoxaemia management. Quantification for Oxygen consumables follows the general formula described in CHAPTER | 3 | SUPPLY CHAIN MAP, SELECTION, QUANTIFICATION AND PROCUREMENT PLANNING.

9.2.3. Annual procurement planning for Oxygen and its supplies

The procedure remains the same as other medicines. However, the Oxygen supply mix per level of care must be considered when determining the relative proportions of Oxygen sources (i.e., cylinders, concentrators, and direct piping) to be planned for.

Procurement of Medical Oxygen and its supplies faces significant challenges - including a lack of an adequate budget coupled with facilities not prioritizing it though it is vital. It is recommended that the MoH creates a ring-fenced (pooled) budget for oxygen like it is done for laboratory commodities.

9.2.4. Pharmaceutical Financial Management (PFM) for Oxygen and its Supplies

It is important to track expenditure on Oxygen and its supplies to inform budget allocation and resource mobilization since Oxygen is a drug of emergency with no alternatives unlike other drugs. The principles and procedures for PFM shall be applied to Oxygen and its supplies as stipulated in the PFM Manual.

9.3. Supply Chain Considerations for Managing Medical Oxygen and Related Supplies

9.3.1. Oxygen Distribution Model

Distribution of Oxygen is based on the **Milkman supply model -** This model involves fulfilling the health facility orders by the exchange of the number of full Oxygen cylinders with an equivalent number of empty Oxygen cylinders at the facility during delivery by NMS/RRHs.

9.3.2. Ownership and accountability of Oxygen cylinders

There shall be a pooled ownership of Oxygen cylinders (All under one entity, the government of Uganda no matter the source/donor). All facilities should be able to account for all oxygen cylinders and other oxygen equipment allocated to them. At the point of refill, a milkman supply model shall be used. The authorized colors of Oxygen cylinders are **white and black** for the neck and body respectively.

9.3.3. Testing, repair, decommissioning and disposal of Oxygen cylinders

Non-functional cylinders shall be pulled out, assessed, and decommissioned centrally. After every 5-year period, NMS together with Ministry of Health Infrastructure Department (MOH-HID) will do hydrostatic testing of all the Oxygen cylinders to ensure that they are fit for use. PPDU disposal guidelines and the national medical equipment guidelines 2023 shall be followed during decommissioning of cylinders.

9.3.4. Transportation of Oxygen

There shall be specialized equipment for transportation of Oxygen i.e., specialized trucks for oxygen cylinders, tanks for Liquid Oxygen (LOX), Oxygen trolleys. Oxygen cylinders on transport trucks should be in an upright position, strapped or fastened to prevent damage to the valve and cylinder walls. All applicable regulations and guidelines for the transportation of flammable material shall be followed.

9.3.5. Ordering for Medical Oxygen and its consumables

9.3.5.1. Oxygen Ordering and delivery Platforms

The following platforms shall be used for ordering Oxygen and its consumables:

- **Routine:** CSSP (NMS+ CSSP) or Medical Oxygen order form
- **PHE:** eELMIS and CSSP or Medical Oxygen order form
- **EMS**: In case of depletion of medical Oxygen during the transfer of a patient, the Ambulance can exchange their empty cylinder for a filled one in a nearby health facility (HCIV, GH and RRH). The transaction shall be taken as a redistribution.

Oxygen, consumables, and equipment should be supplied as per the NMS delivery schedule.

9.3.5.2. Order Quantity Calculation

The consumption method should be used to determine order quantities during routine ordering.

See the example below for estimating requirements for 6.8m^3 cylinder.

$$aAMC = \frac{No.of\ cylinders\ 6.8\text{m3 used in the past 3 months} \times 30}{(90 - DOS)}$$

$$Quantity\ to\ order = (aAMC \times 4) - (No.of\ filled\ cylinder\ 6.8m3\ in\ stock)$$

*DOS is Days Out of Stock

NB: The calculation should be done for all the other cylinder sizes to be ordered.

9.3.5.3. How to fill the Oxygen Order Form

To place an order for Medical Oxygen, a public health facility will complete the Medical Oxygen Order Form and submit to NMS or utilize the electronic version when available in the NMS+ CSSP. For each cylinder size the ordering person will enter aAMC, quantity of filled and empty cylinder in stock and the quantity to order.

Figure 27: Medical Oxygen Order Form

MEDICAL OXYGEN ORDER FORM (ROUTINE & EMERGENCY)						
Purpose: *A standard template that facilitates health facilities to submit accurate and complete order data for Medical Oxygen*						
FACILITY:		**LEVEL OF CARE:**				
RRH ATTACHED:		**DISTRICT:**				
DATE:		**ORDER TYPE**				
ORDERED BY (NAME/PHONE):		**ORDER CYCLE NUM**				
APPROVED BY (NAME/PHONE		**REASON OF EMERGENCY ORDER**				
OXYGEN IN CYLINDERS	**UoM**	**ADJUSTED AVERAGE MONTHLY CONSUMPTION** *(AMCa)*	**FILLED CYLINDERS** *(functional)*	**EMPTY CYLINDERS** *(functional)*	**QUANTITY ORDERED**	**REMARKS**
Cylinder Oxygen (bedside/manifold) 40-60+L/6.8m3 WC/GC (big)	cylinder6.8m3					
Cylinder Oxygen (bedside/manifold) 20-39L/3.5m3 WC/GC (medium)	cylinder3.5m3					
Cylinder Oxygen (ambulance) 10-19L/1.36m3 WC/GC (small)	cylinder1.36m3					
Cylinder Oxygen (transfer) 1-9L/0.68m3 WC/GC (portable)	cylinder0.68m3					
REMARKS						

NB: To order Oxygen consumables, follow the general procedure for Ordering supplies under CHAPTER | 4 | ORDERING EMHS. **Oxygen regulators** and **pulse oximeters** may be replaced regularly since they often wear out quickly.

9.3.6. Receiving Medical Oxygen Cylinders

9.3.6.1. Receiving at the main store

- The people responsible for receiving Oxygen cylinders and other supplies are the same as those of other medicines. Also, the health facility should have enough porters present to lift the cylinders.
- The receiving team shall do the following on receiving Oxygen cylinders:
    - The pharmacist/the inventory management officer must check that the cylinder is full, and the expiry date should be up to three years from the time of filling.
    - The receiving team should ensure that the received Oxygen has a certificate of analysis (COA).
    - Check if the cylinder valves are not broken and if the cylinder has been serviced within the past five years.
    - Exchange an equivalent number of empty cylinders with filled cylinders

9.3.6.2. Receiving at the user department

- On receipt of the cylinders at the ward/unit, the in-charge must check that the cylinder is full and test the received cylinders for purity of Oxygen using an Oxygen Analyzer.
- Any cylinder with Oxygen purity less than 90% should be rejected and returned to stores for replacement. Check if the cylinder valves are not broken. Oxygen cylinders should be kept in designated/zoned areas and chained to the walls to avoid accidents that endanger patients/staff.

9.3.7. Storage of Oxygen and Accessories

9.3.7.1. Storage of Oxygen for Routine Utilization

- For all levels, Oxygen cylinders should be stored in a gazetted area specially designed for Oxygen Cylinders.
- Oxygen cylinders should be stored in a cool, dry, and well-ventilated place away from potential sources of heat (boilers, steam pipes, direct sunlight).
- Filled cylinders should be tagged and segregated from empty ones. They should be placed in zoned areas, kept upright, and chained to the walls.
- Have good access for deliveries and a reasonable level floor surface.
- Easily visible signs such as: no smoking, no open flames or sparks, no oil or grease etc., should be displayed.
- Cylinders should not be exposed to dampness, corrosive chemicals, fumes, etc.
- A suitable trolley/cart should be used to transport and support the cylinders.

N.B: Storage of Oxygen consumables, equipment, and spare parts should be done as per CHAPTER | 6 | STORAGE of this manual.

9.3.7.2. Contingency Oxygen stock for Public Health Emergency

There shall be a contingency stock for Oxygen which will work during PHE at the central warehouse and will be determined from time to time. PNFPs at the level of GHs shall be provided with medical Oxygen public health emergencies.

9.3.8. Inventory Control of Oxygen and Accessories

9.3.8.1. Roles and Responsibilities over the Oxygen production unit

- The **Biomedical engineer** is responsible for producing medical Oxygen, including ensuring quality control and attaching a certificate of analysis (COA) onto filled cylinders.
- The **Pharmacist** is responsible for ensuring good manufacturing practices and stock control at the Oxygen plant.
- The **IMO** is responsible for ensuring documentation and safe custody of cylinders being moved between the stores, the plant, and other public facilities.
- The **Oxygen plant operator** carries out a purity test and attaches a batch certificate of analysis onto the filled cylinders. Then fills the Oxygen production sheet and stock card.
- The **porter** is responsible for the movement of cylinders to and from the stores.

9.3.8.2. Inventory Control during Oxygen Production in Hospitals.

Table 13: Movement of Oxygen cylinders in and out of the production plant/tank in hospitals

Steps	**Categories of Oxygen Recipients**		
	Internal Consumption	**External Public Health Facilities**	**Private Health Facilities (PFP/PNFP)**
1	Transfer filled Oxygen cylinders to the stores and record the quantity issued on the filled cylinders' stock card in the plant.	Empty Oxygen cylinders are delivered to the store with the approved requisition and issue voucher.	The facility makes payment for cylinder refills to the hospital Accountant and obtains a receipt.

Steps	Categories of Oxygen Recipients		
	Internal Consumption	**External Public Health Facilities**	**Private Health Facilities (PFP/PNFP)**
2	The IMO receives the filled cylinders and records such quantities onto the filled cylinders' stock card in the stores.	The IMO records the empty cylinder onto the stock card for empty cylinders.	Deliver the empty Oxygen cylinders to the plant with a stamped receipt.
3	The IMO transfers empty cylinders to the plant and records the quantity issued in the empty cylinders' stock card.	Then issues an equivalent quantity of filled cylinders and records onto the filled cylinders' stock card.	The plant operator fills the Oxygen cylinders and issues the COA. Then records the quantity in the production sheet.
4	The Plant operator receives the empty cylinders and records such quantities onto the empty cylinders' stock card in the plant.	The IMO transfers empty cylinders to the plant and records the quantity issued in the empty cylinders' stock card.	The plant operator records both the quantity produced and issued to the private facility in the filled cylinders' stock card in the plant.

9.3.8.3. Inventory control at the main store

The regular principles for stock control of medicines in the main store as described in Chapters 3-6 of this manual apply to Oxygen cylinders and consumables. This includes documentation (using stock cards, requisition/issuing vouchers, expiry date registers, etc.), regular physical counts and stock reconciliation, losses and adjustments, and stock status reporting, among others.

Store officers should maintain 2 stock cards for each Oxygen cylinder size i.e., one for **filled cylinders** and another for **empty cylinders.**

9.3.8.4. Expired Oxygen in cylinders

Oxygen is deemed expired if it has been in the cylinder for three years or more and/or the purity is less than 82%. The pharmacist/IMO/in-charge documents the loss and adjustment in the stock card/eLMIS and the expired items register. Thereafter, arrange for Oxygen disposal by the Oxygen production unit or NMS.

9.3.8.5. Inventory Control at the User Department

To determine the quantity of filled Oxygen cylinders to requisition, use the departmental Oxygen requirement worksheet to determine the quantity of Oxygen cylinders to requisition from time to time. It is better to use an electronic spreadsheet version of the form so that it auto-calculates the quantity to order after filling the required parameters. However, a manual paper version can still be used successfully.

Tracking/monitoring of usage of Oxygen sources at user departments (i.e., Oxygen cylinders, concentrators, and direct piping) is crucial. The quantities received from the store and connected for patient care are documented in the daily departmental Oxygen consumption log.

Figure 28: Departmental Oxygen requirement worksheet

DEPARTMENTAL OXYGEN REQUIREMENT WORKSHEET

Purpose: *To facilitate determination of the correct quantities of filled Oxygen cylinders to be requisitioned by a department (ward)*

****Instruction:*** *Fill-in the parameters in red to obtain quantity to requisition*

	STEPS	FORMULA	OXYGEN DELIVERY DEVICES								TOTAL/RESULT
			Nasal prongs/cannula	Simple face mask	Bubble CPAP (infant)	Partial-/non- rebreather mask	Mechanical ventilator	High flow nasal cannula	CPAP mask (Adult)	Venturi mask (*flowrate is based on valve color e.g. red is 10*)	
A:	Severity of illness		1	2	3	3	4	4	4	4	
B:	Average flow rate (LPM)		3	8	8	13	18	40	40	10	
C:	*Daily constant (60min/h*24h/day)		1,440	1,440	1,440	1,440	1,440	1,440	1,440	1,440	
D:	Oxygen per patient (Ltrs)	B x C	4,320	11,520	11,520	18,720	25,920	57,600	57,600	14,400	
E:	*# of Patients in ward		3	2	2	1	1	-	-	1	10
F:	Gross Oxygen requirement/day (Ltrs)	D x E	12,960	23,040	23,040	18,720	25,920	-	-	14,400	118,080
G:	Gross Oxygen requirement/day (6.8m3cylinders)	F/6800	1.9	3.4	3.4	2.8	3.8	-	-	2.1	17.4
H:	*Avg. daily quantity from other O2 sources i.e. concentrators & direct piping (6.8m3cylinders)										5
I:	Net Oxygen requirement/day (6.8m3cylinders)	G - H									12.4
J:	*Requisition cycle (days)										7
K:	Oxygen requirement for the requisition cylce (6.8m3cylinders)	I x J									86.6
L:	*BoH of filled Oxygen cylinders										5
M:	Quantity of Oxygen to requisition (6.8m3cylinders)	RoundUp(K - L)									82

Figure 29: Daily Departmental Oxygen Consumption Log

DAILY DEPARTMENTAL OXYGEN CONSUMPTION LOG

Purpose: To facilitate monitoring and accountability for the utilization of Oxygen sources (filled cylinders/concentrators/directly piped 02) at the various points-of-care (wards/departments)

FACILITY:

WARD/UNIT:

YEAR:

MONTH

CONTACT PERSON (Name&Tel)

	A: OXYGEN CYLINDERS (*incl. manifold)												B: CONCENTRATORS				C: OXYGEN DIRECTLY PIPED FROM PLANT / TANK (*excl.		
	Newly Received (Filled)				Newly Connected for Use				Empties Returned to store				Connected for Use (ongoing & new)				Wall Outlets Connected for Use		
DAY	02 Cylinder 40-60+L/6.8m3 WC/GC (Big)	02 Cylinder 20-39L/3.5m3 WC/GC (Medium)	02 Cylinder 10-19L/1.36m3 WC/GC (Small)	02 Cylinder 1-9L/0.68m3 WC/GC (Small)	02 Cylinder 40-60+L/6.8m3 WC/GC (Big)	02 Cylinder 20-39L/3.5m3 WC/GC (Medium)	02 Cylinder 10-19L/1.36m3 WC/GC (Small)	02 Cylinder 1-9L/0.68m3 WC/GC (Small)	02 Cylinder 40-60+L/6.8m3 WC/GC (Big)	02 Cylinder 20-39L/3.5m3 WC/GC (Medium)	02 Cylinder 10-19L/1.36m3 WC/GC (Small)	02 Cylinder 1-9L/0.68m3 WC/GC (Small)	5LPM Concentrator	10LPM Concentrator	15LPM Concentrator	20LPM Concentrator	PSA Oxygen Plant	Liquid Oxygen tank (LOX)	Other piping systems/innovations
1																			
2																			
3																			
4																			
5																			
6																			
7																			
8																			
9																			
10																			
11																			
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30																			
31																			
TOTALS																			
PHYSICAL COUNT DATE PC QTY																	# FUNCTIONAL WALL OUTLETS		
													CONCENTRATOR AVG. RUNNING HRS/DAY				PIPED O2 AVG. RUNNING HRS/DAY		
													DELIVERY DEVICE MOST USED				DELIVERY DEVICE MOST USED		
													DELIVERY DEVICE AVG. FLOW RATE				DELIVERY DEVICE AVG. FLOW RATE		

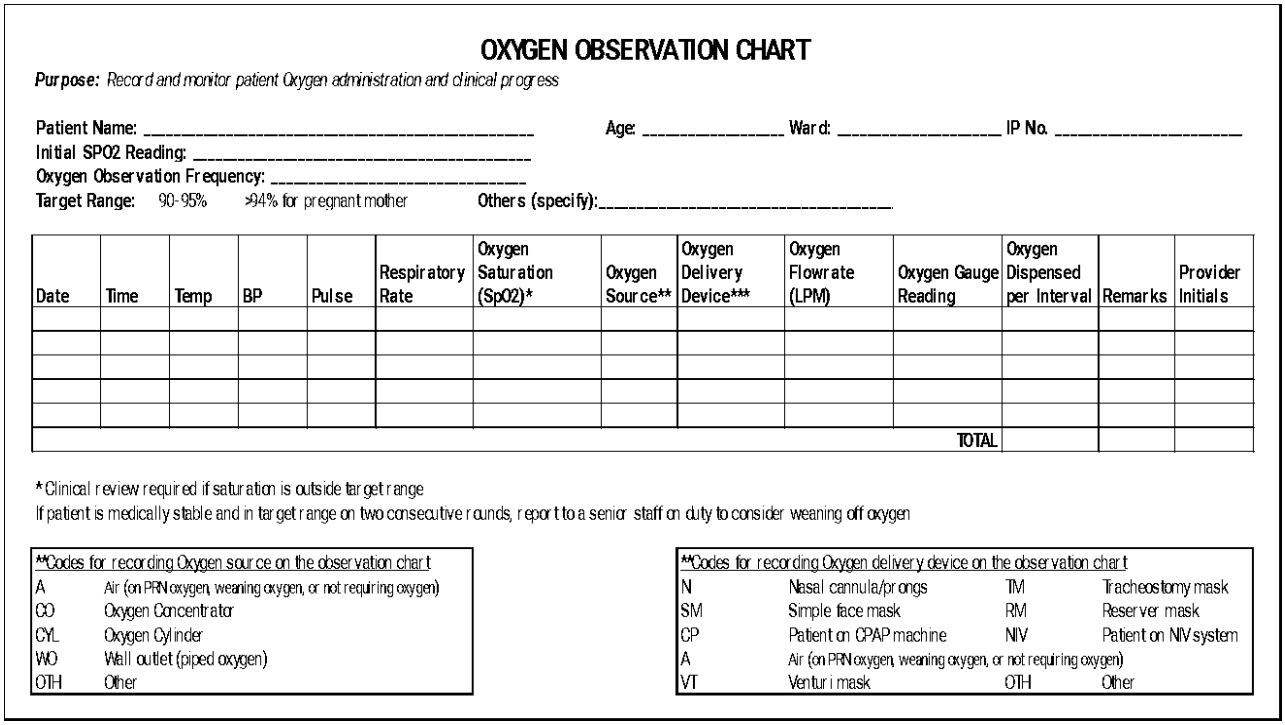
Table 14: Steps in filling the daily departmental Oxygen consumption Log

Section on the Log	Action/explanation
Facility, Ward/unit, Year, Month	Fill in the facility's name, the ward details/name, the year, and month the log is in use. A new month should have its own page
Contact person	Fill in the name of the person responsible for Oxygen/the ward in-charge
Newly Received	Fill in the number of filled Oxygen cylinders received from the store/the pharmacy
Empties returned	Fill in the number of used up Oxygen cylinders returned from the user unit to the main store
Concentrators connected for use	Fill in the number of Oxygen concentrators in use at the ward or unit
Wall outlet connected for use	Fill in the number of outlets connected for use in the ward/unit daily
Totals	At the end of the month, fill in the sum per column
Physical count date	Fill in that date of the month when physical count is done (normally, the last day of the month)
Physical count	Fill in the physically count findings of the filled and empty Oxygen cylinders, concentrators and the wall outlets connected for use
Functional wall outlets	Fill in the number of Oxygen wall outlets that are functional/in good working condition/ useable
Concentrator average running hours per day	Fill in the average running hours per day for the month of log use. =Total number of hours the concentrator was used in a month Number of days the concentrator was used
Piped Oxygen average running hours per day	Fill in the average number of hours the piped Oxygen was used (connected to the patient) per day in the month. =Number of hours piped Oxygen was used Number of days piped Oxygen was used
Delivery device most used	Fill in the type of Oxygen delivery equipment mostly used
Delivery device average flow rate	Fill in the calculated average flow rate of the Oxygen delivery device = Total flow rate per patient that received Oxygen in the month Total number of patients that received Oxygen in a month

9.3.8.6. Tracking/monitoring of Oxygen prescription and administration/dispensing

The Oxygen prescribed and dispensed to the patient is tracked/monitored using the Oxygen Observation chart.

Figure 30: Oxygen Observation Chart



OXYGEN OBSERVATION CHART

Purpose: *Record and monitor patient Oxygen administration and clinical progress*

Patient Name: _____ Age: _____ Ward: _____ IP No. _____
Initial SPO2 Reading: _____
Oxygen Observation Frequency: _____
Target Range: 90-95% >94% for pregnant mother Others (specify):_____

Date	Time	Temp	BP	Pulse	Respiratory Rate	Oxygen Saturation (SpO2)*	Oxygen Source**	Oxygen Delivery Device***	Oxygen Flowrate (LPM)	Oxygen Gauge Reading	Oxygen Dispensed per Interval	Remarks	Provider Initials
										TOTAL			

*Clinical review required if saturation is outside target range
If patient is medically stable and in target range on two consecutive rounds, report to a senior staff on duty to consider weaning off oxygen

**Codes for recording Oxygen source on the observation chart	
A	Air (on PRN oxygen, weaning oxygen, or not requiring oxygen)
CO	Oxygen Concentrator
CYL	Oxygen Cylinder
WO	Wall outlet (piped oxygen)
OTH	Other

**Codes for recording Oxygen delivery device on the observation chart			
N	Nasal cannula/prongs	TM	Tracheostomy mask
SM	Simple face mask	RM	Reserver mask
CP	Patient on CPAP machine	NIV	Patient on NIV system
A	Air (on PRN oxygen, weaning oxygen, or not requiring oxygen)		
VT	Venturi mask	OTH	Other

Table 15: Steps in filling the Oxygen observation chart

Field on the observation chart	**Action/ explanation**
Patient name, Age	Fill in the surname and the first name, age of the patient
Ward	Fill the ward where the patient is admitted
IP. No.	Fill in the unique IPNO from the patient file
Initial SPO2 reading	Fill in the first SPO2 reading taken at OPD or at entry point
Oxygen observation frequency	Fill in the monitoring observation time as instructed
Date	Fill in the date when taking observation
Time	Fill in the time when taking the observation
Temperature	Fill in the temperature taken in degrees Celsius
BP	Fill in the BP reading taken in mmhg
Pulse	Fill in the pulse rate taken in beats per minute
Respiratory rate	Fill in the respiratory rate taken in breaths per minute
Oxygen saturation	Fill in the Oxygen saturation in percentage

Field on the observation chart	Action/ explanation
Oxygen source	Oxygen cylinder/Oxygen Concentrator/Piped Oxygen
Oxygen delivery device	Fill in the type of Oxygen delivery device being used for example nasal prongs/cannulas
Oxygen flow rate	Fill in the amount of Oxygen being given in liters per minute as seen on the Oxygen flow meter
Oxygen gauge reading	Fill in the reading on the Oxygen gauge
Oxygen dispensed per interval	Fill in the amount of Oxygen consumed (i.e. Flowrate from previous reading * interval time (minutes) between the previous and current reading)
Remarks	Fill in any important comments on the patients
Provider initials	Fill in your initials in capital letters
Total	Total amount of Oxygen dispensed

9.3.8.7. Tracking/monitoring use of Oxygen consumables at the user department

Use the dispensing log as usual to track Oxygen consumables at the user unit. It is recommended that a **preformatted Oxygen dispensing log** be availed to enhance the documentation of Oxygen consumables, just like it is done for ART commodities.

Figure 31: Preformatted Dispensing Log for Oxygen

DISPENSING LOG FOR MEDICAL OXYGEN AND ITS CONSUMABLES [PRE-FORMATTED]

Purpose: To facilitate easy documentation of Medical Oxygen and Oxygen consumables dispensed plus stock balances at the Oxygen therapy units

DATE	OPD/IPD	Names and Quantities of Medicines/Health Supplies Dispensed																															Dispenser Initials
		Medical Oxygen (Litres)	Nasal prongs/cannula (neonatal) 1-5Lpm flowrate	Nasal prongs/cannula (paediatric) 1-5Lpm flowrate	Nasal prongs /cannula(Adult) 1-5Lpm flowrate	Nasal prongs /cannula(Adult) 1-5Lpm flowrate	Simple face mask 5-8Lpm flowrate paediatric	Simple face mask 5-8Lpm flowrate adult	Partial rebreather mask 6-10Lpm flowrate adult	Partial rebreather mask 6-10Lpm flowrate paediatric	Non-rebreather mask 10-15Lpm flowrate adult	Non-rebreather mask 10-15Lpm flowrate paediatric	Face tent/shield 10-15Lpm flowrate tent/shield	Venturi mask (with kits) color coded valves/flowrate	CPAP mask variable flowrate mask	CPAP nasal prongs/cannula Paediatric	CPAP nasal prongs/cannula Adult	Nebulizer mask (with chamber) variable flowrate	Airway pieces (oropharyngeal/guedal airways) size 0	Airway pieces (oropharyngeal/guedal airways) size 1	Airway pieces (oropharyngeal/guedal airways) size 2	Airway pieces (oropharyngeal/guedal airways) size 3	Airway pieces (oropharyngeal/guedal airways) size 4	Airway pieces (oropharyngeal/guedal airways) size 5	Ventilator breathing circuits neonatal	Ventilator breathing circuits paediatric	Ventilator breathing circuits adult	Nasal catheter, 8Fr	High flow nasal cannula	Tubing for Oxygen supply	
	Balance B/F																																
	Amount Received																																
	Total Dispensed																																
	Balance at hand (B/F+Amount Received-Total Dispensed)																																

9.3.8.8. Oxygen inventory management for the EMS Ambulance System

The tools above (i.e., Oxygen consumption log, the observation chart and dispensing log) shall be used for the EMS ambulance system. The Ambulance focal person should oversee the inventory management within the ambulance.

9.4. Management of Revenue from Oxygen Plants/Tanks

- Management of revenue from Oxygen plants/tanks shall be done in accordance with Public Finance management Act 2015
- The leadership of MOH/districts/facilities shall request for consolidated funds realized from the sale of Oxygen to finance Oxygen supply systems (production, maintenance, distribution).
- MOH shall standardize pricing for Oxygen cylinder refills by public production plants.

9.5. Appropriate Oxygen Use

9.5.1. IPC for Oxygen Cylinders and Consumables

- All Oxygen consumables are recommended for single use
- IPC guidelines 2020 shall be followed when handling Oxygen cylinders and consumables.
- Cylinders used during PHEs shall undergo the 3-phase decontamination or as stipulated in the most current PHE guidelines.

9.5.2. Oxygen Pharmacovigilance

- Adverse effects of medical Oxygen shall be reported using the existing SUSPECTED ADVERSE DRUG REACTION REPORTING FORM by NDA
- All neonates born less than 32 weeks (about 7 and a half months) or less than 1.5kg who have been on Oxygen therapy should have an ophthalmic review before discharge.
- Oxygen administered to neonates should be blended with medical air as the risk of blindness increases when administered 100% pure Oxygen

9.6. Oxygen Quality Improvement and Performance Reviews

Quality assessments and performance reviews on Oxygen management shall be done following the principles of digital supply chain self-assessment (DSPSS) described in chapter 22and the following supervision/mentorship tool shall be used to assess key quality indicators on Oxygen management. This tool shall be revised as needed from time to time.

Figure 32: Facility Oxygen supply chain management assessment form

FACILITY OXYGEN SUPPLY CHAIN PERFORMANCE ASSESSMENT TOOL				
Purpose: Used as a checklist to keep focus on all relevant issues regarding Oxygen management during support supervision, mentorship, and other quality improvement interventions at a health facility				
FACILITY:		LEVEL OF CARE:		
OWNERSHIP		DISTRICT:		
PERSON(S) MET		REPORTER (NAME/PHONE):		
VISIT DATE:		NEXT VISIT DATE		
MODULE	QUESTION (INDICATOR)	**RESPONSE** (Complies **(C)**/Partially Complies **(PC)**/Not Complying **(NC)**/NA)	**SCORE** (C(1)/PC(0.5)/NC(0)/ NA(0))	REMARKS/KEY STATS
A: Oxygen Availability/Access	1. Does the facility have an adequate stock of filled Oxygen cylinders?			
	2. Does the facility have adequate stock of vital Oxygen delivery devices?			
	3. Does the facility place timely/accurate orders for Oxygen & its supplies based on consumption?			
	4. Does the facility have the minimum number of functional concentrators recommended by NACME? OR does the facility have a working Oxygen plant/tank?			
	5. Do all patients who are prescribed Oxygen given Oxygen?			
	6. Do clinicians check the purity of Medical Oxygen before administering to patients?			

	7. Does the facility budget for Oxygen, its related supplies (i.e., consumables/equipment/spare parts) and Oxygen services (e.g., refills/maintenance/utilities, etc.)?			
		Total Score Part A:		
		Weighted Score Part A: = (total score part A/7)*5		
B: Storage/Handling of Oxygen Supplies	8. Are Oxygen cylinders handled/stored properly at the facility? (both filled & empty)			
	9. Does the facility have appropriate Oxygen cylinder storage premises?			
	10. Are Oxygen consumables stored/handled appropriately?			
	11. Are Oxygen equipment cared for/handled properly?			
	12. Are Spare parts for Oxygen equipment stored properly and inventory records properly maintained?			
		Total Score Part B:		
		Weighted Score Part B: =(total score part B/5)*5		
C. Functionality of Oxygen equipment	13. Are all the facility's Oxygen cylinders functional?			

	14. Are all the facility's Oxygen concentrators functional?			
	15. *[If applicable]* Is the facility's Oxygen piping system functional? (pipes/wall-outlets)			
	16. *[If applicable]* Are all the facility's Oxygen plants/tanks functional?			
	17. Are all Oxygen equipment serviced on schedule and/or repaired on time?			
	18. Does the facility have a reliable power source to run Oxygen equipment optimally?			
		Total Score Part C:		
		***Weighted Score Part C:** =(total score part C/(6-NA))*5		
D. Oxygen Inventory Control	19. Are stock cards for all Oxygen supplies available and updated? (i.e., cylinders both filled & empty, consumables, equipment, etc.)			
	20. Does the physical quantity at hand of Oxygen cylinders and consumables equal the documented stock balance on hand in both store/wards?			
	21. Are Oxygen consumption logs, observation charts, & dispensing logs available and updated at all Oxygen administration points?			
	22. Do all the Oxygen administering departments maintain an inventory record of the availability/functionality			

	status of Oxygen equipment? (e.g., an equipment monitoring log)			
	23. *[If applicable]* Are Oxygen production sheets and cylinder stock cards available and updated at the Oxygen plant/tank?			
		Total Score Part D:		
		***Weighted Score Part D:** =(total score part D/(5-NA))*5		
E. Oxygen Data Visibility/Use	24. Does the facility have an eLMIS with an Oxygen module? Is it functional/being used?			
	25. Does the facility have an EMRS with an Oxygen module? Is it functional/being used?			
	26. Does the facility regularly report on Oxygen using the required tools/platforms (e.g., O2 dashboard, HMIS/DHIS2, NOMAD, PIP, etc.)			
	27. Is there evidence of the facility using its own Oxygen reports/data to improve the management of Oxygen and its supplies?			
		Total Score Part E:		
		***Weighted Score Part E:** =(total score part E/4)*5		
F. Capacity for Oxygen Management	28. Have all the clinicians (nurses/doctors) received training/mentorship on Hypoxaemia management in the recent past?			

	29. Have all the logisticians (store/pharmacy staff) received training/mentorship on Oxygen supply chain management in the recent past?			
	30. Is Pulse Oximetry being done for all patients at triage points in both outpatient and inpatient areas			
	31. Has the facility setup designated places for Oxygen therapy in all key departments i.e., OPD, IPD, Theatre, ER, NICU, ICU etc. which are adequately equipped?			
	32. Are the staff administering Oxygen to patients in all Oxygen therapy units following approved clinical guidelines, good dispensing practices and IPC guidelines?			
	33. Are all the clinicians and logisticians in the facility able to use Oxygen management tools required for their work (e.g. SCM tools, registers, patient charts, reporting tools)			
	34. *[If available]* Are all the logisticians and clinicians able to use eLMIS and EMRS with Oxygen module respectively?			
	35. *[If Applicable]* Are Oxygen plant/tank operators following current good manufacturing practices?			
		Total Score Part F:		
		***Weighted Score Part F:** =(total score part F/(7-NA))*5		
		TOTAL WEIGHTED SCORE *(OUT OF 30)*		
		**OVERALL WEIGHTED SCORE *(OUT OF 5)*		

		% SCORE		
KEY ACTIONS POINTS FOR IMPROVEMENT OF OXYGEN SCM				
**PERFORMANCE GUIDE				
5.0: Excellent				
4.0-4.9: Very Good				
3.0-3.9: Good				
2.0-2.9: Low				
0.0-1.9: Very Low				

10. CHAPTER | 10 | MANAGING LABORATORY COMMODITIES

10.1. Introduction

Laboratory services play a significant role in a country's health system and in delivering quality health services by providing diagnostic results. When diseases are diagnosed incorrectly, not only does the patient suffer, but valuable medicines are wasted treating a disease for which they are not meant nor effective. Correct diagnoses based on correct lab tests prevent incorrect treatment, and the money saved may be used to procure medicines and treat patients effectively.

Laboratory commodities shall be managed as per the general principles for management availed in the essential medicines and Health supplies as detailed in other sections of this manual. However, there are unique considerations that are described in this chapter.

10.2. Characteristics of Laboratory Commodities

The characteristics of laboratory commodities affect the design and management of their logistics system. For example, reagents can come in a variety of preparations (solid, powder, or liquid). A commodity's physical presentation affects how quantification, storage, distribution, and how data is collected and reported. Examples of laboratory commodities' unique characteristics are as follows:

10.2.1. Laboratory commodities used in combination

Each test performed in a laboratory requires several different commodities. For example, a simple malaria test can require two reagents and five consumables. Although one test may require some of the same commodities as another test, typically laboratories will need to manage several hundred or, in some cases, thousands of individual commodities. The sheer number of commodities has serious implications for the design of the logistics information and inventory control systems.

10.2.2. Preparations of laboratory commodities

Laboratory commodities, particularly reagents, come in a variety of preparations. The physical state of a commodity has implications for its storage and distribution and may present challenges in quantifying the commodity.

10.2.2.1. Dry Powders

Some reagents come as dry powders that are then measured and reconstituted with distilled water for use while performing tests. Dry powders are measured using a balance or scale; the liquid used for reconstitution is measured using a graduated beaker. The solution is held and stored in a reagent bottle. Dry powders generally have a longer shelf life than liquid reagents; the shelf life is significantly shorter for the reconstituted reagent.

10.2.2.2. Liquid

Reagents that come in liquid form are often packaged in glass and plastic bottles. Amber glass is used to protect the reagent from light. Reagents packaged in glass bottles are heavier than dry powders, and the bottles break more easily during distribution.

10.2.2.3. kits

Several tests come as kits that contain all or most of the commodities required to perform any of that particular test. The number of tests per kit can vary and should be specified during the procurement process. The kit always contains the reagents for the test, but it may also include consumables used for

collecting and processing the sample. In some cases, those consumables need to be obtained separately. Care must be taken when ordering for kits, the contents of the kits must be known as well as how many tests a kit can perform. For example, the SD Bioline HIV rapid test kit is a pack of 25 tests that contain the buffer and 25 disposable pipettes. To perform the test, however, the technician needs a timer and blood collection devices, which are not included in the kit package. Additional reagents, equipment, and consumables not in the kit should be ordered separately.

10.2.3. Bulk packages

Some laboratory commodities, such as disinfectant, isopropyl alcohol, and distilled water, are procured and distributed in bulk and some dry powder reagents are also distributed in bulk. Commodities distributed in bulk generally are ordered less frequently and require more storage space and for a long period of time.

10.2.4. Short shelf-life laboratory commodities

Certain laboratory commodities have a short shelf life. These include certain reagents that have short shelf lives as low as a month, for example, controls for hematology tests. The length of the shelf life is an important consideration when developing the supply plan for laboratory commodities; a short shelf life requires a shorter plan.

10.2.5. Laboratory commodities with special storage conditions

There is a wide variety of storage requirements as recommended by different manufacturers to maintain viability of laboratory commodities. Most laboratory commodities can be stored following general storage procedures for health commodities. However, laboratory commodities also include:

- Flammables and corrosives, which should be stored separately from other commodities.
- Reagents, which require several levels of temperature storage, including:
    - Cool storage, which requires temperature conditions 25±5°C,
    - Cold storage, which requires refrigeration between 2°C and 8°C,
    - Frozen storage, which requires frozen conditions of either –20°C and below; and
    - Commodities that deteriorate rapidly when exposed to light or moisture.

10.3. Classification of Laboratory Commodities

For the purpose of logistics management there are various ways to classify laboratory commodities.

10.3.1. Reagents, consumables, durables, and equipment

10.3.1.1. Reagents

Reagents are chemicals and biological agents that are used in laboratory testing for detecting or measuring an analyte (the substance being measured or determined). The reagents vary widely in cost, stability, cold or cool chain requirements, availability, and the hazards associated with each variant. Reagents can be further subcategorized into liquid and solid reagents. Examples include sulphuric acid, field stains A &B, ZN reagent, etc.

10.3.1.2. Consumables

Consumables are items that are used once while performing a test and are not reused. Consumables can include such test-specific items as microscope slides, cuvettes and cover slips. Other consumables, such as bleach, alcohol, and gloves, cut across all testing services and are classified as general laboratory

consumables. Generally, reagents and consumables are commodities that are routinely reordered and managed.

10.3.1.3. Durables

Durables are items that can be reused for multiple tests. They include items such as glassware that can be washed, sterilized, and reused where applicable. Durables are ordered on an as-needed basis and do not require the same level of logistics management.

10.3.1.4. Equipment

Equipment are machines and instruments used in testing. These include complex automated equipment, such as viral load testing machines that require regular preventative maintenance and servicing, to basic equipment such as microscopes, water baths and others. The Service agreement for each equipment must be maintained on file in the lab & facility in charge's office clearly spelling out the service provider for maintenance and repairs. In addition, an inventory of all health facility equipment must be maintained by the health facility in charge and updated annually.

10.3.2. Rate of Consumption and Shelf life

10.3.2.1. Slow-moving and fast-moving commodities

Commodities may be classified as slow or fast moving. Slow-moving commodities are those that will take several months to be consumed once issued to the bench and fasting moving are those that are consumed very fast once issued on the bench such as HIV test kits. This is dependent on the level of care; for example, a bottle of basic fuchsin used for staining may take several months to finish at a lower-level facility, and therefore would be considered slow-moving. In contrast, the same bottle may be used up in a matter of weeks at a regional-level health facility and therefore would be considered fast-moving.

10.3.2.2. Long and Short Shelf Lives

Lab commodities can also be classified according to the length of their shelf life. For example, the commodities required to run an automated hematology test include hematology controls that have a shelf life of up to a month, hematology reagents that have a shelf life ranging from one to three years, and consumables, such as Vacutainer containers, that have a shelf life of three years or more. When planning to order reagents for hematology tests, for example, shelf life should be considered to avoid wastage. Such controls are always ordered on quarterly basis with supplier direct delivery to the facility to avoid delays.

10.4. Supply Chain Considerations for Managing Laboratory Commodities

10.4.1. Selection and Quantification

Selection of laboratory commodities should be based on the general principles in chapter 2. However, the following are key areas that must be considered:

- Reagent selection must be aligned to available equipment and testing methods.
- Various MOH approved testing algorithms
- All consumables and accessories required for a given test and per level of care.

Below are the common challenges and recommendations during quantification of laboratory commodities.

Table 16: Challenges and recommendations during quantification of laboratory commodities

Challenges	Recommendations
• Data on past consumption, service statistics, losses, and wastage are difficult to obtain; data on stock balances may not easily be available and of good quality. • Evolution in testing technologies which affects commodity and funding requirements. • Multiple commodities that are required for each type of test must be available concurrently. • Vertical prioritization of commodity categories by donors. • Funding agents use different supply plan periods and procurement mechanisms.	• Facilities must keep their stock status records updated to ease quantification. • Use and compare multiple types of forecasts using logistics, demographic, and service statistics data to forecast requirements for laboratory commodities. • All partners should harmonize their commodity supply processes with the national supply system. • supply plans and delivery timelines should be aligned to ensure that all items are delivered at a particular time. • Monitor your supply pipeline and update forecast on a quarterly basis to ensure flexibility in the supply planning process through regular and systematic reviews of quantities available, forecasts, pipelines, and available funding. • Integrate the quantification process for all laboratory commodity categories in line with Ministry of Health requirements and timelines.

10.5. Storage Management

Storage of laboratory commodities should be based on the general principles in CHAPTER | 6 | STORAGE.

10.5.1. Inventory Management

Management of laboratory commodities inventory should be based on the general principles in CHAPTER | 6 | STORAGE. Each facility from HC III to NRRH should have a designated lab logistic officer responsible for managing lab commodities at the health facility with the facility store Officer. The designee is to ensure the physical count of lab commodities is made, records are updated, and orders are placed and monitors the consumption of commodities at facilities using the following HMIS tools.

- **Stock cards.** Laboratory commodities are managed as part of the EMHS. Each lab item must have a stock card that is updated after every transaction. Stock cards must be kept in one place together with the lab commodities in the health facility main store. The lab must have consumption records to record quantities used for tests.
- **Stock book.** The stock book (kept in the store) is a monthly summary of transactions for each item in the store.

"Laboratory commodities shall be stored with other EMHS considering the recommended storage conditions for laboratory commodities."

10.5.1.1. Recommendations for laboratory inventory management

1. The lab in-charge or the designee must be available to verify lab commodities delivered prior to receipt for storage in the store.

2. *Requisitioning from Facility Stores:* All lab commodities *shall be* requisitioned from the facility store using the Issue & Requisition voucher (HMIS 017) using the standard units of measure.
3. During receipt of Laboratory commodities, the laboratory officer should be available to verify for suitability of purpose (this should be transferred to the general storage principles)
4. *Consumption Records* serve two primary purposes:
    - To record the usage of tests including quality control tests and tests done in outreaches
    - To assist in determining the AMC and therefore quantities to order

Laboratory consumption records include: Daily Consumption Logs and Daily Activity Registers for HC IIs, HC IIIs, HC IVs, Hospitals and RRH.

NOTE

The consumption rate for reagents and other consumables should be obtained from issue data in the stock cards or from an up-to-date stock book.

Where there is functional eLMIS at the facility, all stock management and commodity transactions including lab commodities should be updated in the same system.

10.6. Ordering

Health facilities order lab commodities following the same order delivery schedules as for all other EMHS using electronic ordering systems such as Client Self Service Portal (CSSP) for public facilities. The list of items and the quantities ordered will depend on the facility level, consumption, credit line balance, and shelf life of the commodities:

1. ***Level of facility***. Facilities should give priority to vital (critical) items within their level for the credit line items. The Laboratory in charge or designated personnel should use the stock book to develop the requirements list.
2. ***Laboratory test monthly summary:*** The HMIS 105 (pg. 9/10) Monthly Health Unit Laboratory Tests Summary shall be completed by the laboratory officers. Its purpose is to report the total number of tests done at the health unit by type per month.
3. ***Bimonthly report and order calculation form*** for tests, laboratory reagents, and consumables: At the end of the bimonthly reporting cycle, the laboratory officer responsible for managing lab commodities shall fill out this form. The purpose of this form is to report:
    - Stock-on-hand balance at the facility
    - The bimonthly consumption rate of laboratory commodities
    - Losses & Adjustments
    - Quantities to order

4. ***Credit line balance***. The funding for public facilities, is based on a credit line system. The lab in charge should keep track of the budget utilization and balance so as to always prioritize ordering according to the VEN classification.
5. ***Shelf life and quantity to order.*** The quantity to order is determined by maximum stock minus the stock on hand (obtained from the stock card) at the time of ordering. It is recommended that the order must be made by the laboratory officer and assisted by the store officer. Some reagents have a short shelf life and hence the maximum stock level is fixed at a lower level.

The laboratory LMIS collects three essential data elements including: stock on hand, consumption data and losses and adjustments.

KEY POINTS

1. Laboratory commodities should be stored in the facility main store with each having a stock card.
2. All consumption should be captured (including quality control & outreaches)
3. Facilities should give priority to ordering vital items when using credit line budget.
4. Wastage of reagents should be minimized by ensuring proper storage

11. CHAPTER | 11 | BLOOD DISTRIBUTION AND SUPPLY CHAIN MANAGEMENT

11.1. Introduction

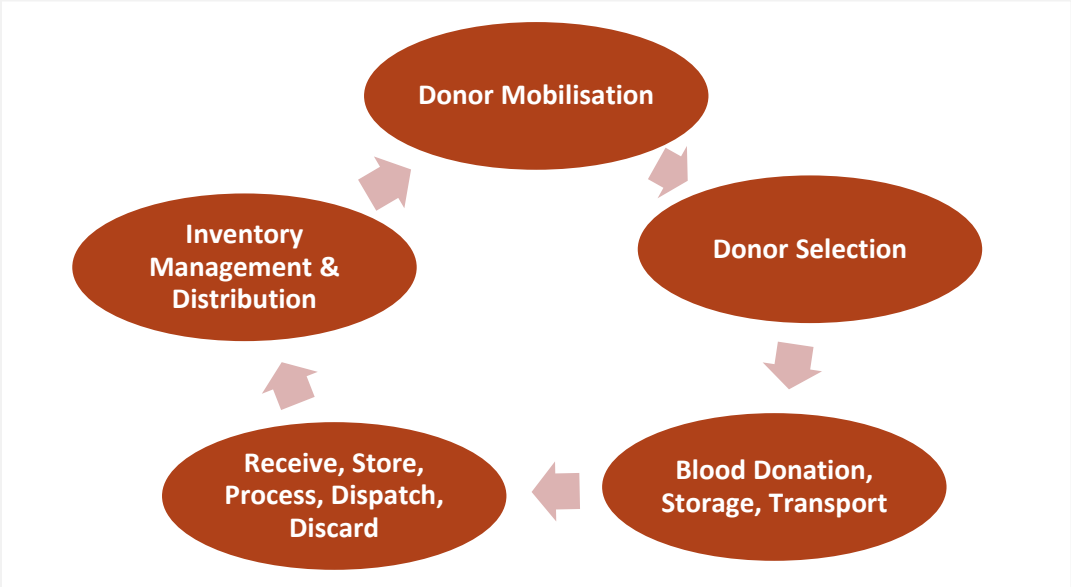
Blood transfusion is an important part of modern health care. Uganda Blood Transfusion Service (UBTS) plays a significant role in the country's health system to provide blood and blood products free of surcharge to patients and other clinical users. Blood products include whole blood and blood components for direct transfusion in patients, i.e., cellular components (red blood cells and platelets), plasma and cryoprecipitate. However, blood products also include Plasma Derived Medicinal Products (PDMPs), which are purified and virally inactivated plasma protein concentrates. PDMPs consist of a group of over thirty unique protein products (including albumin, polyvalent and specific immunoglobulins, and blood coagulation factors) that are typically manufactured in advanced economies from pools of thousands of plasma units by an industrial process called plasma fractionation.

All the blood products are donated by voluntary non-remunerated blood donors, tested in UBTS laboratories as per institutional testing algorithm, which meets Level 2 of the African Society of Blood Transfusion Standards. Blood is tested for HCV, HIV1/2, HBV, and Syphilis. UBTS has established quality management systems for continual improvement of product quality, customer satisfaction, and waste reduction; and a documentation system to achieve international accreditation. The final process of production and supply chain ends with blood components stock in health facilities under responsibility of lab technicians, and clinical head.

UBTS focuses on patient-centred blood supply chain management including storage, transportation and inventory management. The optimization of the use of donated blood and blood components without wastage is all health workers responsibility, however, UBTS collaborates with hospitals and blood establishments to streamline the whole chain and discuss ways to assess and improve blood supply management in the country.

It's important to note that blood comes from human beings and that there is no factory that manufactures blood products, therefore all clinical cadres should endeavour to encourage blood donors and handle this life gift with care.

Figure 33: Processes in blood bank establishment



11.2. The Blood Supply Chain

The blood supply chain starts with the blood donor and ends with the patient, but ultimately it is the requirement for blood by the patient that drives the chain and hence the number of blood donations required. Various factors affect the blood supply chain: the number of donors who are willing to donate regularly, seasonal factors affecting donation e.g. school holidays, the blood services ability to adequately set annual targets or increase in the number of units of blood required throughout the year, and the clinician's awareness of appropriate blood use, ordering, and the hospital laboratories ability to ensure sufficient blood stock management. It is essential that all staff working in each area of the blood supply chain are aware of their responsibilities to ensure minimal wastage of this freely given resource. Therefore, resources, education, training and data collection are important elements of the blood supply chain.

11.3. HMIS Tools for Blood Supply Chain Management

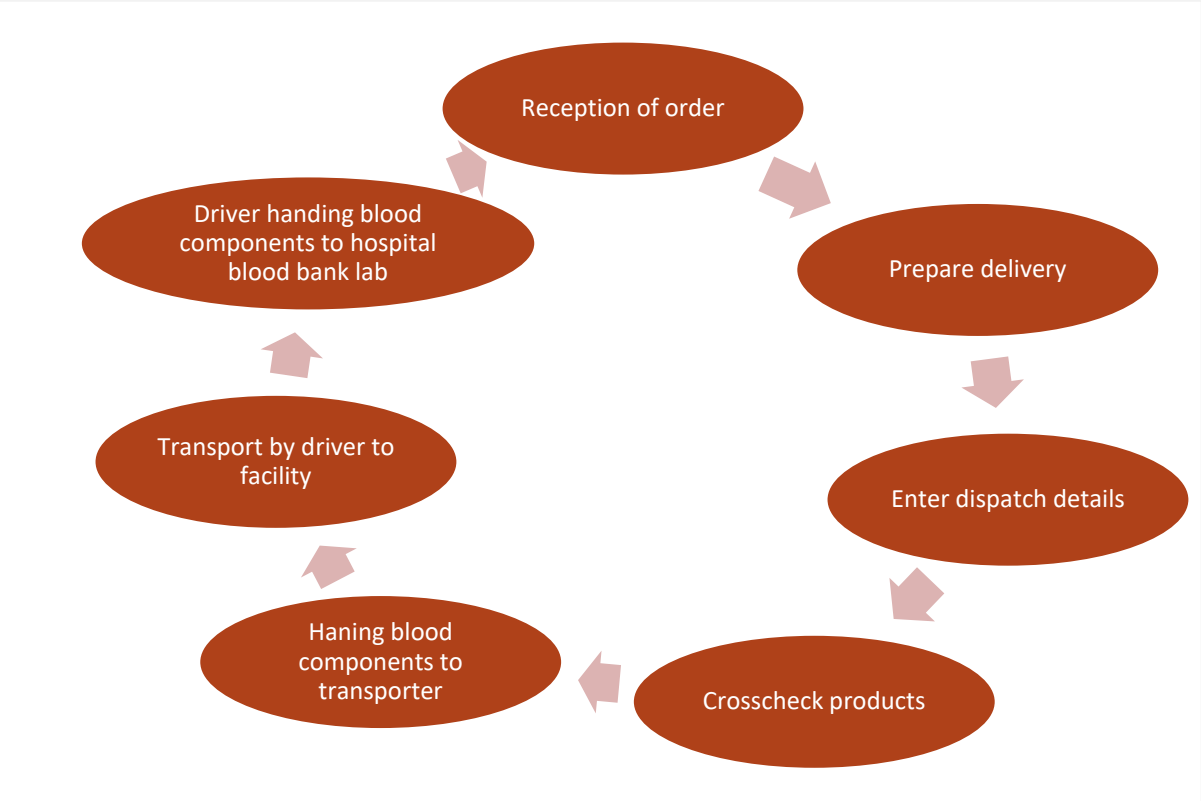
HMIS OPD/IPD Blood Transfusion Request Form (HMIS –UBTS-005), and HMIS facility Blood Component Order/usage Forms (HMIS-UBTS-004), HMIS Blood Receipt Register(HMIS-UBTS-002), HMIS Blood Transfusion Issue Register(HMIS-UBTS-003) and Monthly Report Forms should be used by all regional blood banks (HMIS-UBTS-007). These tools shall be printed by NMS but available at UBTS on request or HMIS tools supply cycle. All columns must be filled to ensure accurate data capture. Noncompliant facilities shall be deferred from receiving blood.

11.4. Ordering Blood Supplies by Health Facility Laboratory

Blood ordering has to be done routinely to ensure sufficient stock of supply in the health facility. Order quantities should be based on stock at hand and current demand or trend analysis with respect to clinical use in the respective facility. Blood types ordered should be clearly indicated (e.g., Group A, B, AB, O and rhesus), type of product (e.g., whole blood, plasma, platelets and red cells concentrates). Special orders and emergency supplies should be ordered separately. Quantities required and previous usage should be included. Minimal stock levels should be established for each facility, with respect to average consumption. Emergency blood supplies have to be incorporated in the order calculations; and liaise with the blood bank medical directors in dire emergencies. The quantity to order and type of product ordered will depend on the facility level of care, stocking capacity and shelf life of the product. Methods of Ordering: Hard copy using HMIS-UBTS -004 and online using email info@ubts.go.ug .

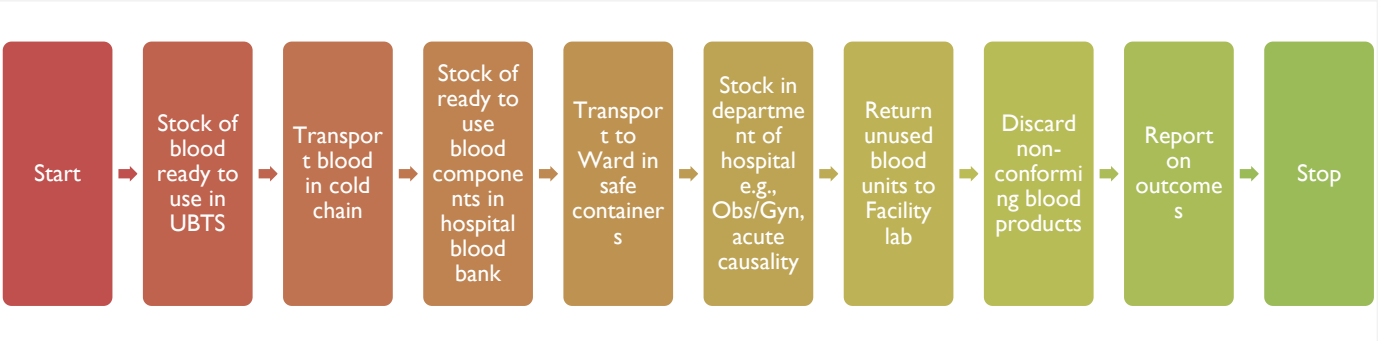
Note: The consumption data for blood and blood components should be obtained from Blood Reception Register, issue registers, ward blood requests data, discards, blood bank returns and in the IPD book or from copies of blood requests filed in lab (reporting tool HMIS108).

Figure 34: Processing customer order for blood or blood components



11.5. Transporting Blood from Regional Blood Banks to Health Facility

Blood has to be transported in cold chain using approved blood transport containers to prevent damage or deterioration of the blood products. The transport containers should meet the capacity of blood ordered, must be clean. 1-10°C is ideal temperature for most blood products during transportation, except platelets which are stored at 20°C +/- 2 prepared within 8 hours. Long distance shipments should be done as per shipment guidelines of blood products (obtained from blood bank). Blood bank staff issuing should guide packaging for transport. Do NOT accept expired or non-blood bank labelled blood products.

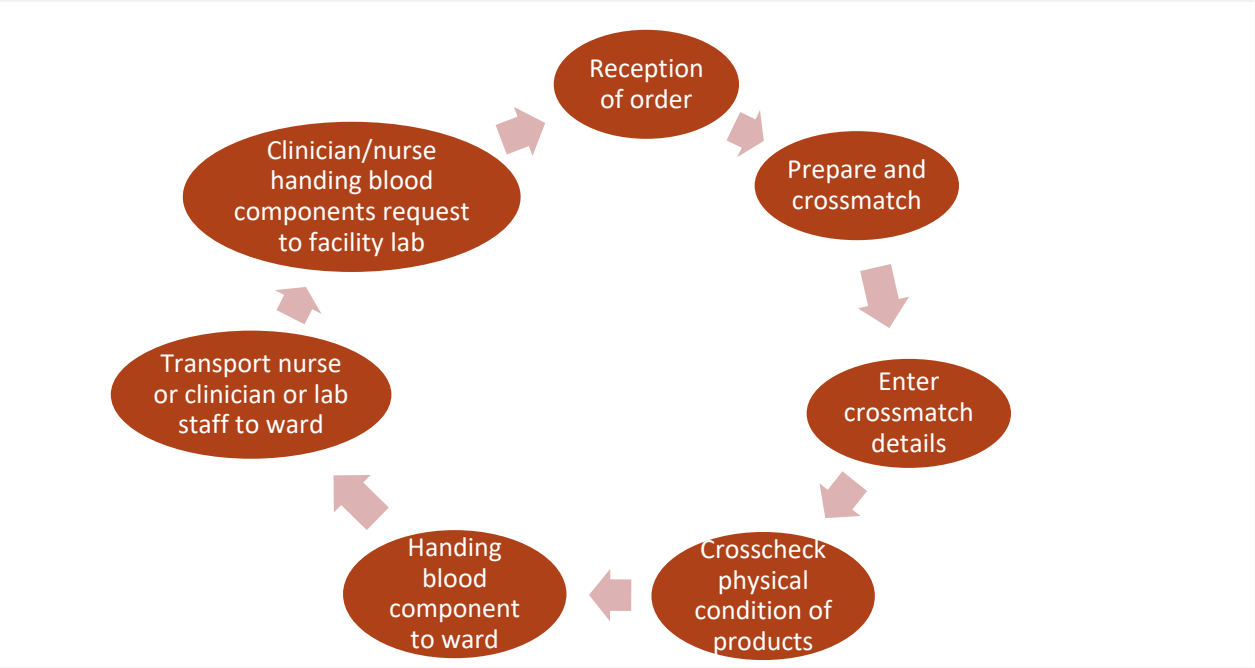


11.6. Ordering blood from facility Laboratory

Health facility clinicians can order for blood products from the hospital lab. The clinician's requests should be driven by patient needs for transfusion. Platelets have a short shelf life of five days and hence

should be requested on demand. Blood alternatives and blood substitute options should be explored before placing blood requests for transfusion.

Figure 35: Intra-facility activity of blood supply



11.7. Receiving blood supplies at supplier and user End.

All blood supplies should be received urgently to maintain cold chain. Procedure for receiving blood at blood bank and Health facility may vary as per facility standards.

11.7.1. Receiving blood supplies at regional blood bank

Once blood has been delivered to Blood bank, the staff on duty must ensure the blood is stored at required temperature (2-6^{0}C) in refrigerator or cold room. The delivery officer before setting off from the field must complete the blood delivery form. Upon arrival at regional blood bank, the personnel receiving blood shall sign on the form after verifying units and cards. The procedure for blood receipt at regional blood bank is stipulated in (SOP-LAB-01) using the form (UBTS-LAB-FM-14). In case of receiving screened blood from a regional center; check the serial number of units against the accompanying list (UBTS-LAB-FM-13) and follow step 8.6 in (SOP-LAB-01) above. Place the units in the issue refrigerator.

11.7.2. Receiving blood supplies from Regional blood bank by Health facility Laboratory

In response to the Health Facility request for blood products, the regional Blood Bank issues blood products accompanied by an electronically generated delivery note (voucher). The delivery note contains details of the Hospital, person issuing, person receiving, Quantity of blood units issued, types of blood products and their different blood groups. Upon arrival at Facility Lab, these details in the delivery note should be cross-checked for quantity, physically inspected and recorded by the Laboratory personnel in the Blood Receipt register (HIMS-UBTS-002). Immediately store the blood in designated blood bank refrigerator at (2-6^{0}C)

11.8. Equipment, Storage and Consumables in Blood Supply Chain

11.8.1. Storage

Ideally blood products should be stored in a designated refrigerator, with an auto frost cycle, special insulation, min and max external thermometer and a functional alarm system. Blood should not be frozen except FFP, FP and cryoprecipitate. An alternative power supply should be on standby in case of power failure. Special conditions are required, whenever handling blood in the ward. Blood must be kept in a separate area within the ward. For cold chain items such as controls and blood group reagents, the lab personnel must receive and keep them in the reagent refrigerator in the lab and ensure required temperature is maintained. The lab in-charge or the designee must be available to verify blood supplies delivered prior to receipt for storage in the facility blood bank refrigerator.

11.8.2. Equipment

Equipment for provision of blood should be maintained and replaced when necessary.

11.8.3. Consumables

Consumables may not always be enough but critical equipment should be purchased to ensure blood availability and safety. Each facility should budget for equipment and consumables for blood management.

11.9. Blood Products, Indication, and Shelf Life

The Blood Bank can produce four types of products, namely: whole blood, red cell concentrates, platelets and cryoprecipitate. The facility lab in-charge *must be* part of the facility medicines and therapeutics committees to provide technical assistance as regards the blood transfusion.

Figure 36: Products, alternatives, substitutes available for supply in Uganda

Component	Common Indication	Storage	ABO Compatibility	Expected Shelf Life
Whole Blood	Acute blood loss	1-5˚C	YES	35 days
Red Cell Concentrates	Anaemia	1-5˚C	YES	42 days
Frozen Plasma	Burns, haemorrhage	-25˚C or lower	YES	1 year
Fresh Frozen Plasma	Severe blood loss, warfarin reversal, acute DIC, and burns	-25˚C or lower	YES	1 year
Platelets	Massive haemorrhage, Coagulation disorders, TTP, DIC	RT 20˚C +/- 2˚C	When possible	5 days
Cryoprecipitate	Haemophilia A, VwD	-65˚C	When possible	1 year
Alternatives	Anaemia prevention, Autologous BT, cell salvage			
Blood Substitutes	Crystalloids and colloids e.g., Dextran, albumin, saline			
Recommended	Transfuse if benefit outweighs risk of transfusing. Distribute saline in facilities. Promote healthy Living			

Ideally, blood products should be stored in designated fridge, auto cycle, special insulation, in and max ext. temperature recording and functional alarm system. The storage temperature in house should be 1-5˚C and 1-10˚C during transportation. Blood should not be frozen except FFP, FP and cryoprecipitate. An alternative power supply should be on standby in case of power failure.

11.10. Blood Stock Management

Each facility from HC IV to national referral or private facility should have designated logistics/blood focal personnel from existing staff, responsible for managing blood supplies. The designee is to ensure the physical count of blood units is made at receipt, records are updated, orders are placed, and monitoring of the storage conditions and expiry of blood units at facilities is done.

a) **Blood Receipt Register**: Blood products are managed as part of the EMHS. Each blood group *MUST* have a stock page that is updated after every transaction. Stock register must be kept in one place together with other record books in the health facility lab. The lab *must* have records of blood received for audits.
b) **HMIS Facility Component Order Forms (HMIS-UBTS 004)** (kept in the lab): Are a routine tool for ordering blood products. Transfusing health facilities should have a defined schedule for collecting blood from regional blood banks and a vehicle designated by the health facility.
c) **HMIS OPD, IPD Blood Transfusion Request Forms (HMIS-UBTS 005):** All transfusion requests *shall be* made by clinicians or nurse in charge and sent to the facility lab after full completion of all relevant fields in the form. Lab staff shall not accept incomplete forms.
d) **HMIS Facility Blood Transfusion Issue Register:** Record the usage of blood and patient details of cross match in this register. Utilization records assist in determining the AMC and therefore quantities to order. Sections below are important and as such should always be completed.
    - Patient category helps in determining product quantity
    - discard records help determine waste and expiry rates
    - total requested helps to quantify blood need in country; and
    - indication helps in guiding the blood service to supply right product types
e) **HMIS Monthly Summary Report Form** (kept in regional blood banks): Reports total units collected, received, tested, distributed and ordered by the regional blood bank. This form shall be completed by the UBTS laboratory in- charge. Its purpose is to report collections, tested and utilization per month.
f) **Daily Report and Order Calculation for Blood and Components:** At the end of the day or reporting cycle, the laboratory personnel (blood focal person) responsible for managing blood *shall* fill out HMIS Order form. The purpose of this is to report:
    - Know the blood stock-on-hand balance at the facility
    - The consumption rate of blood supply
    - Losses & Adjustments
    - Quantities to be resupplied to the facility by the Blood bank
g) **Heamovigilance Reports:** the HMIS Bedside Transfusion hemovigilance forms (HMIS-UBTS-001) and HMIS-UBTS -006 shall be used for reporting all transfusion adverse events as they occur. The report summary is then sent to the blood bank when picking the next stock. For emergency investigations, call the blood bank.

11.10.1. Data management

Data management is the responsibility of blood banks and facility designees. Access to blood donor and patient transfusion data shall be confidential, but retrievable on authorized request.

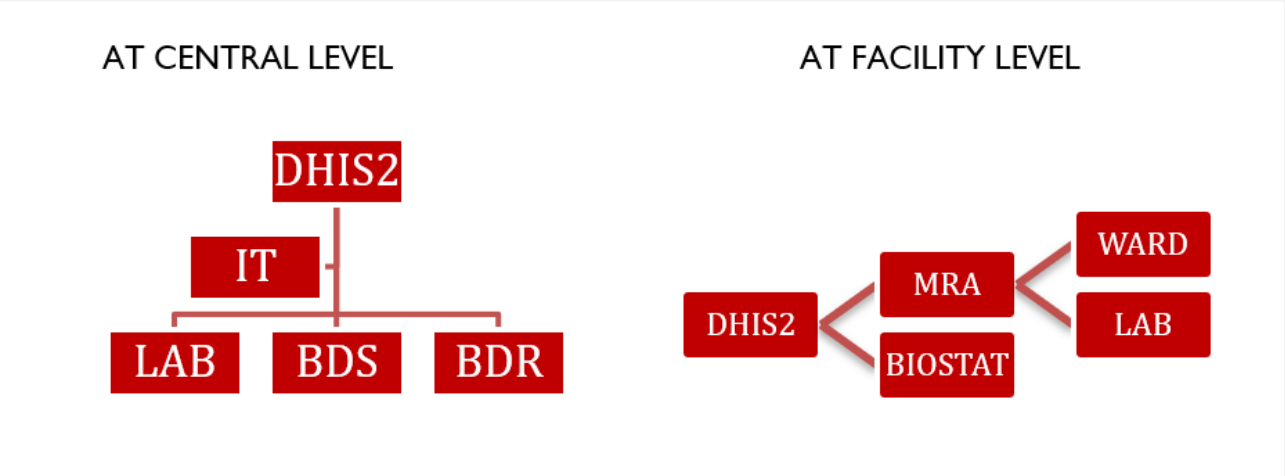
Figure 37: Blood data records

Central Level	Health Facility Level
BSIS system is used to capture data Inputs Sessions conducted	Capture data using HMIS tools Blood received in facility (HMIS-UBTS -002)
Total units collected Total units received in lab Total units processed	Blood cross matched (HMIS-UBTS-003) Blood issued to the wards (HMIS-UBTS-003)
Total units tested Total units ordered/requested Output Quantity issued Quantity discarded by category Facilities supplied Stock on hand	Blood discarded (HMIS-UBTS-002) Balance at hand in facility laboratory (HMIS-UBTS-002)

11.11. Reporting Structure for Blood Supply Chain Management

The facility reporting structure may vary depending on level of care. Below is the guidance reporting structure for transfusing facilities.

Figure 38: Facility guidance reporting structure for blood supply data



11.12. Blood Supply Reporting and Indicators

Regional blood banks and transfusing health facilities shall take responsibility to report all transfusion data to MOH through the line managers in the stated reporting cycle from HMIS and blood bank guidelines. Data verification and DQA should be done by responsible officers before submission to DHIS2.

Table 17: Blood indicators in DHIS2

Blood indicators in DHIS2	REPORTING HMIS TOOL
1- Number of units requested from RBB	HMIS-UBTS -004
2- number of units received	HMIS –UBTS -002
3- Number transfused	HMIS-UBTS-001
4- number of adverse events	HMIS-UBTS -006
5- Number of units needed (assumed blood need) by facility	HMIS –UBTS-005

11.12.1. Utilization Of Special Services: User Report in DHIS2

All transfusing facilities must report monthly in the DHIS2 (HMIS 108 5a and 5b). Failure to adhere leads to withdrawal of annual certificate authorizing the facility to transfuse.

Table 18: Indicator report format for blood supplier and users

5a. Service (Blood transfusions)	Whole blood	Packed cells	Platelets	Fresh Frozen Plasma	Cryoprecipitates
1 Number of Blood units requested (Units)					
2 Number of Blood units received (Units)					
3 Number of Blood units transfused (Units)					
4 Number of adverse Blood reactions in the Health Facility					

Table 19: Supplier (RBB) Report in DHIS2

5b. Reasons for transfusion	Whole blood				Packed cells				Platelets				Fresh Frozen Plasma				Cryoprecipitates			
	0-4yrs		5+yrs		0-4yrs		5+yrs		0-4yrs		5+yrs		0-4yrs		5+yrs		0-4yrs		5+yrs	
	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
1 Severe malaria																				

2 Obstetrics																			
3 Gynaecology																			
4 Accidents																			
5 Cancer cases																			
6 Sickle cell Anaemia																			
7 Iron Deficiency Anaemia (IDA																			
8 Other Coagulopathies																			
9 Surgeries																			
Total of units of blood Transfused																			

All regional blood banks must report monthly in the DHIS2 under UBTS section. The tool for monthly report data collection is (HMIS-UBTS -007). The indicators to report on include: Number of sessions organized, number of units collected, number of units received in the lab, number of units tested, number of units ordered, number of units issued, number of facilities supplied, number of units discarded

11.13. Blood Quality Assurance

Quality assurance (QA) is part of the mission of BTS to provide safe blood products as required for therapy. QA applies not only to products but also to services rendered to blood donors, recipients and physicians. The role of hospital QA and BTS QA is to identify non-conformances, errors and prevent reoccurrence. SOPs detailing BTS activities should be followed in the supply chain. Training should be addressed at facility level through BTC and each staff should be trained before handling blood. Blood Audits shall be done by BTS quarterly as a monitoring process of compliance to AFSBT standards.

QA is responsible to train staff, perform competence testing, data management, internal audit. Technical assistance should be sought to support safe blood transfusion at all levels. Annual planning on blood needs and accountability for blood products is a joint venture for all stakeholders. For moral and ethical reasons blood gifts remain anonymous, and medical secrecy should be observed at all levels of blood supply chain.

KEY POINTS

- Blood products should be stored in the facility main lab with each group having a stock page.
- All blood utilized should be captured (including type, discard & expiry).
- Facilities should give priority to ordering emergency online, followed by hard copy, while using emergency order forms.

- Wastage of blood products should be minimized by ensuring proper storage, diagnosis, use of alternative, substitutes and by timely returns to blood bank before expiry.
- Rare blood types such as O neg, AB neg, should only be stocked according to need.
- Ensure cold chain equipment are in place before blood collection.
- Report all transfusion adverse events to Hospital lab and blood bank as they occur.
- Obtain patient consent using bedside monitoring form.
- Incinerate discarded blood products.

Figure 39: Uganda blood transfusion coverage

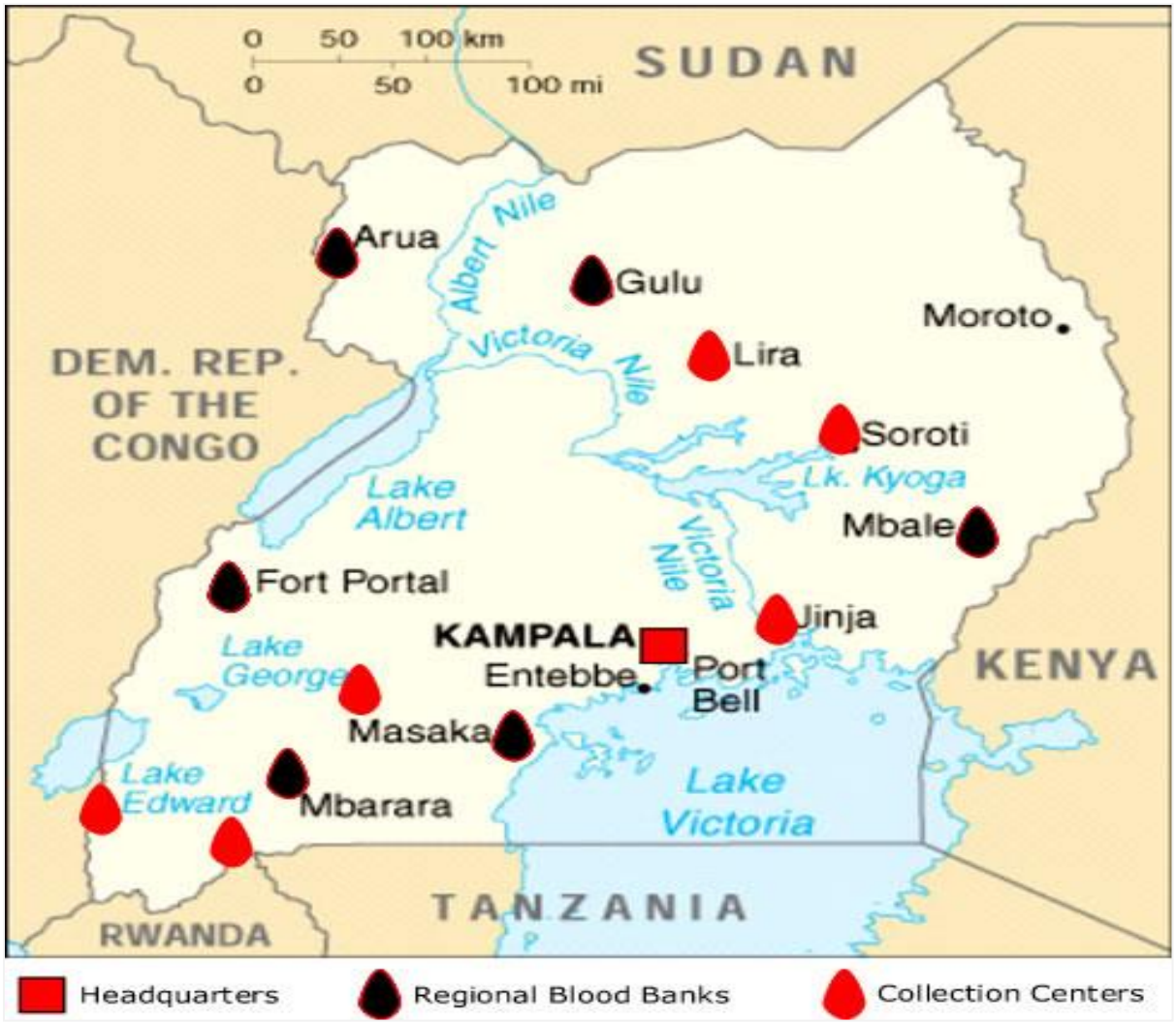


Table 20: List of blood collection and transfusing facility equipment

Blood Collection	Transfusing Health Facility
Stop watches/ wristwatch [timers]	Deep freezer
Personal protective equipment	Min /max Thermometer or data loggers
Portable Blood tube sealers	Ice packs
Insulated	
Cool boxes 20L,40L,70L,100L	Water bath
Portable haemoglobin meters and cuvettes	sample Rack

Blood Collection	Transfusing Health Facility
Spring balances Weighing balances of donors (bathroom scales) BP machines Stethoscopes tourniquets Scissors	Stop watches/clocks [timers] Personal protective equipment HB meter Blood Bank fridge Hand Tube sealer
Pilot Tube strippers BB blood shakers and balances Station Donor Beds Portable donor beds Plastic Forceps [blue] Test tube sample Rack Drums, kidney dishes, bowls, trays Portable field furniture, chairs, tables &others Blood donation counselling screens Field Staff and blood transportation vehicles Aprons First Aid box Stress balls Spill kits Bed sheets Portable tents Cheatles and forceps jar Waste bins and sharps boxes Donor satisfaction surveys boxes Donor chairs and Tables Universal bottles Ice packs Lap tops	Scissors Test Tubes Cool Box 20L,40L,60L Weighing balance (Digital) Platelet Shaker Centrifuge bench Top Giving set Blood Warmer Power Back up system Blood transportation vehicle Lab coats Staff chairs and tables

12. CHAPTER | 12 | VACCINES SUPPLY CHAIN MANAGEMENT

12.1. Introduction

Immunization service delivery is dependent on the vaccines supply chain, which ensures that the six rights of logistics management i.e., right vaccines and safe injection materials, right quantities, right condition, right place, right time and right cost are adhered to. The six rights of logistics management guide effective vaccines supply chain management in Uganda. An effective and robust vaccine supply chain management improves immunization coverage and equitable access, hence reducing morbidity and mortality from vaccine preventable diseases.

The aim of this chapter is to outline best practices of vaccines and injection materials supply chain management at all levels of the healthcare system.

12.2. The Vaccines Supply Chain

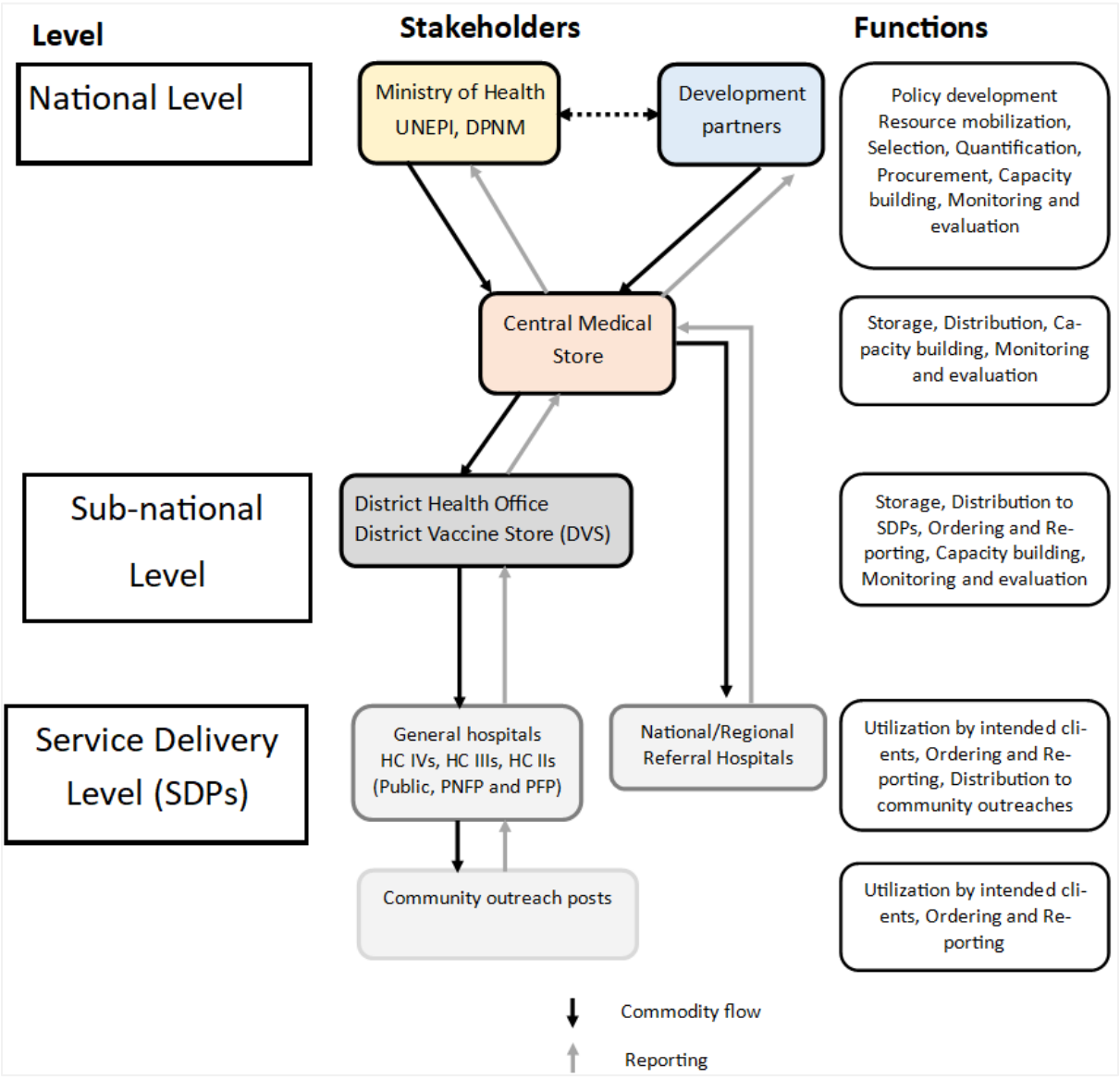
The vaccine supply chain encompasses all activities involved in the procurement, storage and distribution of vaccines, as well as the management of related data and information. A well-functioning vaccine supply chain management system ensures that vaccines reach the intended recipients in a timely and safe manner, thereby maximizing the impact of immunization programs on public health.

In Uganda, the vaccine supply chain management system consists of three tiers: the national level, the subnational level (district vaccine stores), and the service delivery level.

The national level includes the Ministry of Health (MoH), development partners and the central warehouse, which are responsible for vaccine selection, procurement, storage, and distribution, a policy development and monitoring and evaluation. The subnational level comprises of the district health office and district vaccine store. The district health office is responsible for coordinating and supporting immunization services, ensuring availability of vaccines at the service delivery points and provision of reports to the Ministry of health as well as conduct quarterly review meetings (vaccine supply chain, etc.). The service delivery level include:

National referral hospitals, regional referral hospitals, General hospitals, Health Centre IVs, Health Centre IIIs and Health centre IIs. The health facilities are expected to conduct community immunization outreach activities, capture data and the data is reported by the respective health facilities to the district health office (DHO). After the community immunization activity, all open vaccine vials should be properly discarded.

Figure 40: Flow of vaccine supply chain in Uganda



At the subnational level, the district cold chain technicians (DCCTs) make orders using available service tools monthly. Quantities to order should take into consideration viable stock balances and target populations. The key role of the cold chain technician is to manage the vaccines at the district vaccine store and provide cold chain equipment maintenance support to health facilities.

12.3. Forecasting and Quantification for Vaccine Supplies

12.3.1. Right quantities

The availability of an adequate supply of vaccines, diluents and safe-injection materials of assured quality is critical to every immunization service. Effective management of supplies can help save on program costs, prevent high wastage rates and stock-outs, and improve the safety of immunization.

This section outlines three methods that are commonly used to estimate vaccine and safe injection material needs at all levels of the supply chain.

a) Estimating vaccine and injection equipment/material needs based on the target population.
b) Estimating vaccine and injection equipment/material needs based on previous consumption.
c) Estimating vaccine and injection equipment/material needs based on number of persons immunized during previous immunization sessions.

12.3.2. Estimating vaccine and injection equipment needs based on the target population

Annual national and district/sub-national level forecasting for vaccines and associated logistics is based on the target population. This method is also used for estimating vaccine requirements for Supplemental Immunization Activities (SIAs) at all levels.

The following information is required to forecast vaccine and associated logistic needs:

Target population	-	Tp (number)
Targeted coverage	-	Tcov (%)
Number of doses in the schedule	-	Dos (number)
Vaccine wastage rate	-	WR (%)
Wastage factor	-	WF (number)

$$Total\ doses\ per\ year\ (E) = A \times B \times C \times D$$

12.3.2.1. Target population (Tp)

The target population is obtained by multiplying the total population bya given percentage. The target population for routine immunization consists of women of childbearing age (15 –45), 10-year-old girls, children aged 0-11 months and any other special groups as the program shall decide. The calculation for target population for a planned year takes into consideration the annual population growth rate.

Table 21: Computation of population size to be immunized based on coverage objectives (assume that the total population is 5,000,000 (5 million) people)

Target population	% of total population	Number to be immunized
Live births	4.85%	4.85/100 x 5,000,000 = 242,500
Children from 0 to 11 months	4.30%	4.3/100 x 5,000,000 = 215,000
Children from 0 to 59 months (Polio SIAs)	20.50%	20.5/100 x 5,000,000 = 1,025,000
Children from 6 months to 59 months (measles SIAs)	18.50%	18.5/100 x 5,000,000 = 925,000
Girls aged 10 years for HPV vaccination	2.20%	2.2/100 x 5,000,000 =110,000

Target population	% of total population	Number to be immunized
Pregnant women	5.00%	5/100 x 5,000,000 = 250,000
Non-pregnant women	18.00%	18/100 x 5,000,000 = 900,000
Women of childbearing age (15 – 45 years)	23%	23/100 x 5,000,000 = 1,150,000

The above calculation takes the following into consideration the following:

- The annual population growth rate to determine the target population for each planning year.
- Doses in the immunization schedule. The immunization schedule gives the age limits and the number of doses required for the full immunization of each eligible child and woman for each given antigen *(Refer to the National Immunization schedule)*.

12.3.2.2. Targeted coverage

The targeted annual coverage for each antigen depends on the immunization microplans at district level. These plans determine the percentage of each group of the target populations to be immunized.

Table 22: Example of targeted immunization coverage by antigen

Vaccine	Target age group	Target population	Immunization coverage (%)	Strategy	No.to be immunized
BCG	0 -1 months	21,350	90	Routine	90/100 x 21,350 =19,215
Polio	0-11 months	21,350	90	Routine	90/100 x 21,350 =19,215
Polio	0 -59 months	102,500	100	SIAs	100/100 X 102,500 =102,500
DPT -	0 -11 months	21,350	80	Routine	80/100 x 21,350 =17,080
Measles	0-11 months	21,350	80	Routine	80/100 x 21,350 =17,080
Measles	6-59 months	92,250	100	SIAs	100/100 x 92,250 =92,250
TT (WCBA)	15-44 years	115,000	25	Routine/ campaigns	25/100 x 115,000 =28,750

12.3.2.3. Vaccine wastage rate and wastage factor

When immunization activities are carried out, the number of vaccine doses used is higher than the number of persons immunized. The number of doses in excess constitutes "lost doses" or wasted vaccines, this is called vaccine wastage. Vaccine wastage should be considered in the estimation of vaccine needs.

12.3.2.4. Wastage Factor

Knowing the vaccine wastage rates helps to determine the wastage factor, which is one of the parameters used to estimate vaccine needs.

$$Wastage\ factor = 100 - wastage\ rate$$

Each level can calculate its wastage rates for each antigen based on the following parameters.

	Parameters	Source of data
A	Initial stock	Vaccines and Injection Materials Control Book
B	Received stock	Vaccines and Injection Materials Control Book
C	Issued out to other facilities	Vaccines and Injection Materials Control Book
D	End of period	Vaccines and Injection Materials Control Book
E	Children vaccinated	HMIS 105

$$Vaccine\ wastage\ rate\ (VWR) = \frac{\{(A+B)-(C+D)\}-E}{(A+B)-(C+D)} \times 100$$

$$Wastage\ factor = \frac{100}{(100 - wastage\ rate)}$$

Example

Wastage rate = 30%

Wastage factor = 100/ (100-30) = 100/70 = 1.43

Table 23: Wastage factor corresponding to the wastage rates

Wastage rate	5%	10%	15%	20%	25%	30%	35%	40%	45%	50%
Wastage factor	1.05	1.11	1.18	1.25	1.33	1.43	1.54	1.67	1.83	2.00

Example for calculating the annual needs of OPV vaccines for a given target population

Children (0-11 months)		Doses in Schedule		Targeted coverage		Wastage factor		Vaccine needs
10,000	x	4	x	90%	x	1.43	=	51,480

12.3.2.5. Key considerations in vaccine wastage

Open vial wastage: This is the amount of vaccine that remains unused in the vial after reconstitution during vaccination. The duration between reconstitution and use differs for every vaccine and this information is clearly indicated on the respective vaccine package insert.

Figure 41: Vaccines with their open vial duration.

Vaccine product name	Manufacturer	Lyophilized vaccine (powder)	Liquid diluent (may contain vaccine)	Time allowed between reconstitution and use, as stated in package insert*	Diluent storage environment
ActHIB (Hib)	Sanofi	Hib	Sodium chloride 0.4%	24 hrs	Refrigerator
COVID-19, Pfizer-BioNTech, some formulations	Pfizer-BioNTech	see footnote†	Sodium chloride 0.9%, unpreserved	12 hrs	Refrigerator or room temp
Dengvaxia (DEN4CYD)	Sanofi	Dengue	Sodium chloride 0.4%	30 min	Refrigerator
Hiberix (Hib)	GSK	Hib	Sodium chloride 0.9%	24 hrs	Refrigerator or room temp
Imovax (RAB_{HDCV})	Sanofi	Rabies virus	Sterile water	Immediately‡	Refrigerator
M-M-R II (MMR)	Merck	MMR	Sterile water	8 hrs	Refrigerator or room temp
Menveo§ (MenACWY)	GSK	MenA	MenCWY	8 hrs	Refrigerator
Pentacel (DTaP-IPV/Hib)	Sanofi	Hib	DTaP-IPV	Immediately‡	Refrigerator
ProQuad (MMRV)	Merck	MMRV	Sterile water	30 min	Refrigerator or room temp
RabAvert (RAB_{PCECV})	GSK	Rabies virus	Sterile water	Immediately‡	Refrigerator
Rotarix§ (RV1)	GSK	RV1	Sterile water, calcium carbonate, and xanthan	24 hrs	Refrigerator or room temp
Shingrix (RZV)	GSK	RZV	AS01B‖ adjuvant suspension	6 hrs	Refrigerator
Varivax (VAR)	Merck	VAR	Sterile water	30 min	Refrigerator or room temp
Vaxchora (CVD 103-HgR)	Bavarian Nordic	Cholera	Buffer solution plus bottled water	see footnote¶	Refrigerator
YF-VAX (YF)	Sanofi	YF	Sodium chloride 0.9%	60 min	Refrigerator or room temp

Adapted from: Vaccines with Diluents: How to Use Them (immunize.org)Open vial wastage is more pronounced in multiple dose vaccine vials for instance BCG, Hepatitis B vaccine.

Closed vial wastage: This refers to expired, poorly stored, damaged untampered vaccine vials. **Thawing of vaccines (done at Warehouse)**: Vaccines like Morderna, Pfizer, Johnson and Johnson are stored under ultralow temperatures to maintain their viability and sterility. The change of state from frozen(solid) to liquid such that it is administered in the body is referred to as thawing. The change means that the vaccines attain an "end use by date". An end-use by-date is the date beyond which the vaccine is not viable for use. This is only applicable for vaccines that require thawing. Once a vaccine reaches its end-use-by date, it is no longer viable for use even when the manufacturer's expiry date is not due. However, in case the manufacturer's date is closer than the end-use-by-date, the vaccine will be rendered unusable when the manufacturer's expiry date is due.

- Thawing is done at the central warehouse under strict supervision.
- Precautions
    - Once these vaccines are thawed, they should not be refrozen.
    - Depending on the vaccine stability structure, the end-use-dates differ for every vaccine for instance the COVID-19 Pfizer vaccine has a 30-day shelf life from the day of thawing, while the COVID-19 Johnson & Johnson vaccine has 11 months shelf life from the day of thawing.

12.3.3. Estimate vaccines using previous vaccine consumption

This method is used at the district, HSD and health facility levels when ordering for vaccines for the next supply period. The following information should be available during the ordering/reporting.

- The quantities of each vaccine used in the last month.
- The current physical stock,
- The target population to be served in the period the vaccines will be used (when applicable especially in mass campaigns).
- The number of people vaccinated.

The amount needed is calculated and filled in on the requisition form.

To be able to order vaccines required for the unit, the following should be used:

- Previous stock (opening balance at the beginning of the reporting period) = A
- Current physical stock (closing balance at the end of the reporting period) = B
- Total doses used (A-B) = C
- Reserve [50% of the usage (C x 0.5)] = D
- Maximum vaccine stock requirement [usage plus reserve (C + D)] = E
- Amount of vaccine doses to order for the next supply period (E – B) = F

The above can be summarized as follows:

$$Amount\ of\ vaccines\ to\ order = Total\ doses\ used + reserve\ stock - physical\ stock$$

$$amount\ of\ vaccines\ to\ order = \{(A - B) + D\} - B$$

In Uganda the districts and health units are expected to keep a stock of six weeks including a reserve of 50%.

REMEMBER

Always avoid stocking vaccines for periods longer than six weeks at the health unit level. In case a facility has vaccines stock for more than six weeks, use old stock before new stock depending on First in First out (FIFO) or First Expiry First Out (FEFO) or Vaccine Vial Monitor (VVM) status. It is better to have more vaccines than required at a session than not having enough. This calls for monitoring the session size to have adequate stock for 6 weeks.

12.3.4. Estimate vaccines for an immunization session

Use the number of children immunized during the previous immunization sessions to estimate vaccines for both static and outreach immunization sessions.

12.3.5. Estimate injection safety materials

All EPI vaccines except for OPV and Rotavirus are administered by injection. Of these vaccines, BCG and measles must be reconstituted before being administered. The Ministry of Health, WHO and UNICEF recommend that all vaccine orders be bundled with auto-disable syringes (for mixing and administration) and safety boxes for waste disposal.

The term bundling refers to a set of vaccines, auto-disable syringes (for mixing and administration) and safety boxes supplied together in corresponding quantities. Bundling does not necessarily mean the items are packaged together in the same container. However, managers at all levels should ensure that health workers get the adequate quantities of vaccines, injection materials and safety boxes. It is particularly important to ensure that one has adequate space for storing AD syringes, safety boxes, vaccine carriers, ice packs and other supplies.

At all levels, the estimation of injection safety materials is made based on the following:

- The number of children < 1 year of age and the number of women of child-bearing age.
- The anticipated coverage (the number of children and women) targeted for vaccination.
- The number of doses of each vaccine according to the immunization schedule per child/woman (e.g., 1 dose of BCG, 3 doses of DPT-HepB-Hib, 3 doses of PCV, 3 doses of HepB, 1 dose of IPV, 1 dose of Measles, 2 doses of HPV, and 2 doses of TT).
- The total number of vials of each freeze-dried vaccine (Reconstitution syringes: one per vial of vaccine + 10% wastage rate)
- Safety boxes (1 box for 100 used syringes and needles)

To calculate the required injection materials for a given target population, the same method which was applied for estimation of vaccines is used.

Calculate auto-disable (AD) syringes and safety boxes.

A		B		C		D		E
Target population	X	Doses in the immunization schedule	X	Wastage factor	X	Coverage rate (%)	=	Total AD syringes for administration
Total doses for each vaccine	/	Doses in a vaccine vial	X	Wastage factor			=	Total AD syringes for reconstitution
Total AD syringes	+	Total mixing syringes			/	100	=	Safety boxes

Example of calculating the annual needs of AD syringes for a given target population to receive injectable vaccines e.g., Measles vaccine.

Children 0 – 11 months		Doses in schedule		Immunization coverage		Wastage factor		Estimated needs
8,000	X	1	X	90%	X	1.11	=	7,992

12.3.6. Ordering Vaccine Supplies

- Conduct the recommended monthly physical stock count exercise for all viable (i.e., VVM stage 1 & 2, passed the shake test and not expired) vaccines and injection materials at the District Vaccine Store.
- Reconcile records (Vaccines and Injection Materials Control Book) maintained at the District Vaccine Store.
- Indicate the physical stock balances on the District Monthly Vaccine Order Form under the "Viable Stock Balance" column as doses/pieces, respectively.

12.3.6.1. The district's quantities

- The District Vaccines Ordering Tool is a tool that projects the need for vaccines and injection materials based on the district population. It is currently an excel-based electronic tool, with plans of converting it to an ELMIS.

12.3.6.2. How to use the District Vaccines Ordering Tool

- Order will be automatically generated under the "Order Quantity" Column (this may not be altered).
- If you intend to adjust any order quantity, the desired quantity can be indicated in the "Adjusted Order" column for that respective antigen.
- Adjusted orders should have comments (e.g., slow uptake, increased demand, etc.)
- Submit the order to the respective NMS Customer Care Representative.

12.4. Storage of Vaccine Supplies

12.4.1. Preparations for receiving of vaccines and injections materials

Prior to the arrival/receipt of new stock of vaccines and diluent, CHECK and ensure:

- Functionality of the refrigerator: check if gas is available, refrigerator is defrosted, and the cooling system is working well (check if recorded temperatures are in the standard range); and clean the refrigerator.
- That all un-usable vaccines (expired vaccines, vaccines with no labels, vaccines with VVM at discard point stage 3 or 4, contaminated vaccines - partially used vials of OPV, TT or DPT-HepB-Hib which have been submerged in water or have been stored in compromising conditions) are removed. Such vaccines should be recorded in the Vaccines and Injection Materials Control Book as wasted doses, and then discarded according to the guidelines.
- Availability of temperature monitoring tools i.e., temperature charts, thermometer/ electronic temperature monitoring devices.
- Up to date Vaccines and Injection Materials Control Book
- Old vaccine stock in the fridge is arranged to create storage space for the expected stock.
- Storage space for the diluent and injection materials is created in the refrigerator/store.

12.4.2. Receive vaccines, diluent, and injection materials at the health facility

- Check and ensure the types and amounts of vaccines and diluents delivered tally with what was ordered. If there is any difference (if it is more or less), find out why.
- Check vials for cracking or loss of labels.
- Sample and check the status of the Vaccine Vial Monitor (VVM) on each vial.
- Check that the expiry date on each vial has not passed. Do not accept the vaccine if it is expired.

- Put the vaccines in the refrigerator as quickly as possible, arranging vaccines according to their sensitivity to heat or coldness and the type of refrigerator as indicated below (Figure 42, Figure 43 and Figure 44).
- As you pack vaccines in the refrigerator, separate old stock from new stock either by labelling or by use of hard cards.
- Leave the cold box or vaccine carrier open to dry out.
- Enter date, source, amount, expiry date, vial size, batch number, manufacturer, and the VVM Status of each vaccine received in the Vaccines and Injection Materials Control Book.

Note that you should not:

- Accept to keep vaccines in excess of 6 weeks.
- Receive the vaccines if delivered at a temperature above $+8^{O}C$.
- Mix the old stock of vaccine with the new stock.

12.4.3. Storage of Vaccines -Best Practices

12.4.3.1. Side opening refrigerator (Sibir)

- Unpack vaccines immediately
    a. Put vaccines that are first to expire in front so as to adhere to the First Expiry First Out (FEFO) rule. In case vaccines are of the same expiry date, then the First in First out (FIFO) rule should be followed. These rules apply to injection materials as well.
    b. Arrange vaccines neatly in rows on refrigerator shelves all the time. Leave a space of 2-5 cm between rows of vaccines to allow air circulation.
    c. Sort and label vaccines by type in the refrigerator.
    d. Store polio vaccine on the shelf near the freezer compartment.
    e. Store measles and BCG vaccines on the shelf next to the one of the Polio vaccine if the refrigerator has shelves.
    f. Store DPT-HepB-Hib, PCV, Rota, IPV, HPV, hepatitis B and TT vaccines on the shelves immediately below the shelf containing measles and BCG vaccine.
- Store diluent next to its corresponding vaccine in the refrigerator, a day before the planned immunization session.
- Keep ice packs filled with water on the bottom shelf. They help to maintain the temperatures in the refrigerator.
- Freeze and store the frozen ice packs in the freezer compartment.
- Store vaccines at ideal temperature
    a. Store refrigerated vaccines at (2-8OC) and frozen vaccines at -50OC to -15OC
    b. DO NOT store refrigerated vaccines in the freezer
- Use vaccine storage best practices
    a. Ensure that the refrigerator door is closed properly after every opening
    b. Ensure that the refrigerator has an independent electric socket, which is not used for other purposes. Do not unplug the refrigerator from the electrical outlet.
    c. Do not put vaccines on door shelves or on the floor of the refrigerator/freezer.
    d. Do not put food or beverages in the refrigerator.

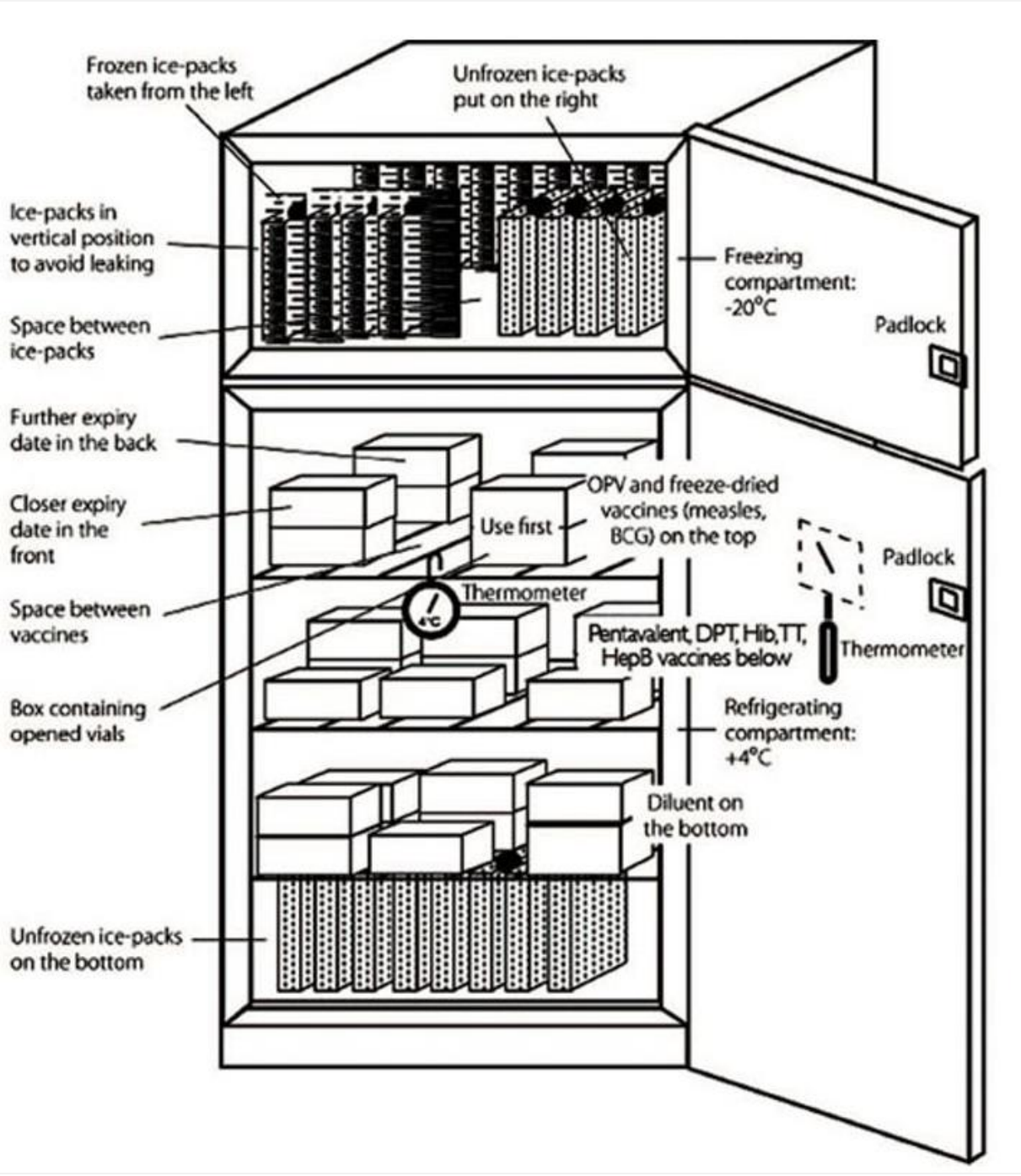
NOTE

- The temperature for vaccine storage should be between $+2^{0}C$ to $+8^{0}C$ at all levels.

- Keep returned usable vials that have been taken out of the refrigerator in a special box labelled "returned and date of return". Have another small container with partitions if possible, for partially used vials of OPV, DPT-HepB-Hib, HepB and TT Vaccines (stand-alone vials). Use these vials first in the next static session.
- Never store DPT-HepB-Hib, PCV, IPV, HPV, HepB, Rotavirus and TT close to the coldest part of the fridge because they will freeze.

12.4.3.2. Side opening refrigerator

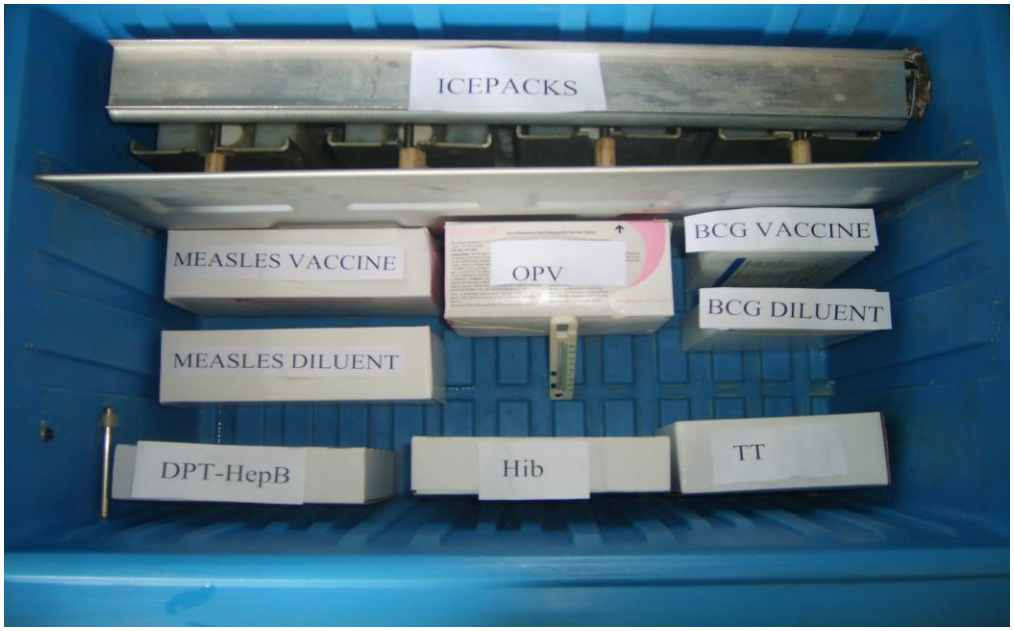
Figure 42: Loading vaccines in a side opening refrigerator



Source: WHO, 2004

12.4.3.3. Top Opening Refrigerator (RCW42EG)

Figure 43: Loading vaccines and ice packs in a top opening refrigerator (RCW42EG)



When storing vaccines in a top opening refrigerator (RCW42EG), the same rules as for side door opening apply except:

- Store vaccines neatly in the order of their sensitivity where OPV, measles and BCG are packed next to the freezer compartment. DPT- HepB-Hib, PCV, HepB, Rota, IPV, HPV and TT should be packed far away from the freezing compartment as indicated in the picture above. Leave space of about 5 cm between rows of vaccines to allow air circulation.
- Pack diluent for BCG and measles vaccine next to the respective vaccine when there is adequate space but remember to protect it from freezing. Always remember to pre-cool the diluent a day before the planned immunization session.
- Freeze and store four frozen ice packs in the freezer compartment at a time.

NOTE

This refrigerator has a freezer compartment that holds four ice packs at a time, and they freeze in approximately 48 hours.

12.4.3.4. Load vaccines in a top opening refrigerator (Iceliner)

Figure 44: Good vaccines warehousing practice

Good warehousing practice	Bad warehousing practice
	
√ In baskets with thermometer - vaccine safe	× No baskets, no thermometer - vaccine at risk

12.4.3.5. Placement of vaccine refrigerator/freezer

- Place the refrigerator/freezer in a well-ventilated room, leaving space between the unit, ceiling, and any wall.
- Do not block the cover of the motor compartment with any item.
- Place the refrigerator/freezer on firm and level ground, with the bottom of the unit above the floor.
- Make sure the refrigerator/freezer door opens and closes smoothly and fits squarely against the body of the unit.

12.4.3.6. Pack vaccines in a cold box or vaccine carrier

Vaccines are usually packed in a cold box or vaccine carrier:

- During transportation to the district, HSD, or Health facility.
- For temporary storage of vaccines during Supplemental Immunization Activities (SIAs); where vaccine storage space is not adequate, or when the refrigerator is faulty, and the health unit is preparing to transport the vaccines to a place with a functioning refrigerator.
- When the refrigerator is undergoing defrosting.
- During immunization sessions (static or outreach).

When preparing to deliver vaccines to a health sub-district, a health unit or an outreach/static immunization session, you should:

- Make sure there are adequate stocks of vaccines, diluents and injection materials.

- Make sure the cold box or vaccine carrier is clean and not cracked, the rubber seal is in place and the vaccine carrier has a clean sponge. Note: Make sure there are conditioned ice packs in the cold box or vaccine carrier
- Put the diluent in the refrigerator a day before delivery to the outreach/static immunization session.
- Estimate vaccines to deliver depending on the supply period for the health sub-district or health unit (usually one month) and estimated session size for outreach.
- When using a vaccine carrier, place 4 conditioned ice packs around the inside walls of the vaccine carrier.
- Using a polythene bag (white or black), pack polio vaccines as you quickly check the label for expiry date, colour of the VVM and place it at the bottom of the vaccine carrier.
- Next, pack BCG and measles vaccines and their pre-cooled diluent(s) in the same way as the polio vaccines in the vaccine carrier.
- Place DPT-HepB-Hib, PCV, IPV, HPV, HepB, RotaV and TT vaccines that are already packed in polythene bags and place them on top of the BCG and measles vaccines.
- Place a thermometer/electronic temperature monitoring device in the vaccine carrier.
- Place a clean sponge on top of the vaccines in the vaccine carrier.
- Close the lid of the vaccine carrier tightly.

12.4.3.7. Transportation of Vaccine Supplies

- Ensure that cold chain safety procedures are followed during transportation of vaccines.
- Ensure that the cold box/vaccine carrier has an intact rubber seal.
- Make sure that the cold box/vaccine carrier is securely closed.
- Ensure availability of reliable transport to deliver the vaccines.
- The supply, requisition and issue HMIS form should accompany the amount of vaccine to be delivered or issued to the unit.

NOTE

- Vaccines should be accompanied or transported by a health worker who appreciates the cold chain related issues.
- Do not place a cold box or vaccine carrier in direct sunshine to avoid a fast rise of the temperature in a carrier.

12.5. Managing Diluents

Freeze dried vaccines are supplied with diluents which vary in composition. The diluents are not sterile water for injection, which is a common misconception. Diluents may contain:

- Stabilizers that ensure heat stability of vaccines
- Bactericides to maintain the sterility of the reconstituted vaccine
- Chemicals to assist in dissolving the vaccine into a liquid
- Buffers to ensure the correct pH (acid-alkali balance)

NOTE

In the past, the practice of supplying, transporting and storing diluents separately from the vaccine has caused confusion and resulted in shortages of the correct diluents in the field.

Tragedies have occurred, related to reconstitution of freeze-dried vaccines with insulin, muscle relaxant, laboratory reagents, ergometrine/oxytocin, ARVs, anti-rabies and other wrong solutions. Poorly labeled and unidentified vaccines and diluents have complicated this, due to lack of adequate training of health workers.

Health workers should ensure that other products apart from vaccine diluents are not stored in the vaccine refrigerator or cold boxes or vaccine carriers together with vaccines.

Diluents should be handled in the same way as vaccines, and vaccination staff should be trained to know the proper way to reconstitute each of the vaccines.

12.5.1. Guidelines for Management of diluents

- Diluents should be stored and distributed together with the vaccine vials they will be used to reconstitute.
- Diluents must NOT be frozen.
- Diluents must be pre-cooled to between +2°C to +8°C before reconstitution (to prevent vaccine shock due to sudden change in temperature).
- Diluents for other types of vaccine or from other manufacturers must NOT be used because they might contain different components. It is a requirement that vaccines always be accompanied by diluents from the same manufacturer.
- Distilled water for injection should NEVER be used as a substitute for diluent.

NOTE

- Use conditioned ice packs when packing, transporting and storing vaccines to avoid freezing of freeze sensitive vaccines
- Remember to always put a thermometer/electronic temperature monitoring device in the cold box or vaccine carrier during storage, transportation or during the immunization session
- Bundle vaccines with the corresponding diluent and injection materials
- Record all vaccine, diluent and injection materials details in the Vaccines and Injection Materials Control Book

12.6. HMIS Tools for Vaccines Supply Chain Management

There tools are required to maintain proper record and report on the use of vaccines at the subnational and service delivery levels:

- ***Vaccine and Injection Materials Control Book (HMIS Form 017d)***: All the vaccines and injection materials received at all levels of immunization service delivery should be recorded in the Vaccine and Injection Materials Control Book (VIMCB). It is completed daily whenever immunization is carried out.

- ***Vaccine Utilisation Monitoring Form (HMIS Form 017d)***: Used to summarise data on the utilization of each antigen for reporting to the district health office. It is completed every month.
- Tally sheet
- District Vaccine Ordering tool

In the next section, we go into the details of how to fill these tools.

12.6.1. Vaccines and Injection Materials Control Book (VIMCB)

DESCRIPTION AND INSTRUCTIONS

Objective: To improve vaccine and other EPI supplies stock management.

Timing: Daily.

Copies: One copy per health unit.

Responsibility: Health facility In-Charge or EPI Focal Person

12.6.1.1. Guidelines on Filling of the Vaccines and Injection Materials Control Book

The Vaccines and Injection Materials Control Book is a very important information tool. It keeps all the information on vaccines and injection materials, which are received and issued out at national, District, HSD and peripheral storage centres. To ensure effective use of the Vaccines and Injection Materials Control Book, the health worker/storekeeper/records assistant should follow the under listed guidelines.

- The Vaccines and Injection Materials Control Book should have the name of the storage centre.
- Each type of vaccine and injection materials is recorded separately.
- Information on the vaccine received/issued out is entered immediately in columns on each page as described above (refer to Figure 45: Extract of the Vaccines and injection material Control Book (VIMCB)).

Table 24: Description of Columns of the Vaccines and Injection Materials Control Book (VIMCB)

Label	Instructions
DATE	Record the actual date of receiving OR issuing the vaccines and injection materials.
NAME OF HEALTH FACILITY	Record the name of the facility where vaccines and injection materials are received from OR being issued/delivered to.
STOCK AT HAND	Record the physical count of the vaccines and injection materials found in the refrigerator or store.
DOSES RECEIVED	Count and record the actual doses/pieces of the new stock of vaccines OR injection materials received.
VVM STAGE	(The vaccine vial monitor) The point to focus on is the colour of the inner square relative to the colour of the outer circle.
VIAL SIZE	Write the Vial size which is number of doses per vial.
MANUFACTURER	Write the source of the vaccine.
BATCH NUMBER	Read and record the batch number of every vaccine and injection materials received.

Label	Instructions
EXPIRY DATE	Read from the vaccine vials/injection materials and record expiry date. If the vaccines/injection materials received expire on different dates, then record them separately.
DOSES/PIECES ISSUED	Record doses/pieces taken out of the refrigerator/store and issued out for static or outreach immunization session or to other health facilities.
VVM STAGE	Follow as column 5 for appropriate action to be taken.
BATCH NUMBER	Read and record the batch number of every vaccine and injection materials taken out of the refrigerator/store for immunization sessions or issued to another health facility.
EXPIRY DATE	Read and record the expiry date of every vaccine and injection materials taken out of the refrigerator/store for immunization sessions or issued to another health facility.
DOSES USED	Using the tally sheet for every immunization session, count the number of children/women immunized and this will give you total number of doses used which should be recorded at the end of the immunization session.
DOSES WASTED	Total doses in opened vials minus total number of the vaccinated children and women equals' doses wasted.
DOSES RETURNED	Total doses of unopened vials returned from an immunization session (static and outreach) plus partial used vials of OPV, TT and DPT-HepB –Hib and HepB at static session.
BALANCE	Enter the total balance of vaccines/pieces of injection materials in stock immediately after issuing to a health facility, receiving new stock/returned vaccines, or carrying out physical count at the storage centre/static unit.
REMARKS	In this column, you may write comments on the condition of the vaccines received, issued, or discarded e.g., VVM in stage three, lack of diluents, broken vials, vaccine vials without label, and transfer of vaccines due to cold chain failure or missing stock during physical count.

KEY POINTS

- Record vaccines and injection materials received as soon as they are put in the refrigerator/store.
- At the time of issuing vaccines and diluent for the static or outreach sessions, record the amount issued without waiting for the teams to come back.
- Balance the Vaccines and Injection Materials Control Book every time you receive or issue vaccines and injection materials and on returning from the outreach or static session.
- Remember to record the balance of doses of the open vials of OPV, DPT-HepB-Hib and TT used at the static session using the tally sheet(s).
- Remember to match diluents with the vaccines (BCG & Measles) from the same manufacturers and should be in equal numbers well indicated in the vaccine and injection materials control book.

.

Figure 45: Extract of the Vaccines and injection material Control Book (VIMCB)

VACCINE NAME:						MONTH.....			YEAR.....								
Received									Issued								
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)
Date	Name of Facility/ Out Reach	Stock at hand	Doses received	VVM stage	Vial size	Manufacturer	Batch number	Expiry date	Doses/ pieces issued	VVM stage	Batch number	Expiry date	Doses used	Doses wasted	Doses returned	Total balance	Remarks

12.6.2. Vaccine Utilisation Monitoring Form

DESCRIPTION AND INSTRUCTIONS

Objective: Improved practices in vaccine management

Timing: Every month.

Copies: One copy remains at the health Facility.

Responsibility: In-Charge or EPI Focal Person

All the data needed to accomplish this task is gotten from the Vaccine and Injection Materials Control Book and it should always be up to date.

- Find the Start balance (Amount of vaccines at the beginning of the month for each antigen) in the vaccine control book. Enter the value for the Beginning Stock Balance (column A).
- Get the doses received by summing up the start balance plus doses received during the month from the vaccine control book for each antigen for the entire month. Enter the value in (column B).
- Find the Balance on hand (Ending stock) in the vaccine control book at or near the end of the month for each antigen. Enter the values for the Ending Stock Balance (column D).
- Enter the doses given to other health facilities in (column C).
- Calculate the Doses Used (accessed) (column G) for each antigen every month as in the equation below.

- $(Beginning\ stock\ balance + Doses\ received\ during\ the\ month) - (ending\ stock\ balance + Doses\ given\ to\ other\ units)$
- Calculate the Doses wasted (column H) for each antigen every month as in the equation below.
- $Doses\ used\ (accessed) - Number\ of\ children\ immunized$
- Calculate the wastage rate % for each antigen by (column I)
- $[100 - utilization\ rate\ (\%)$
- Column J is for the reasons that led to the wastage of the vaccines.
-

N.B. Ensure that the Vaccines and Injection Materials Control Book is up to date prior to filling the tool

Figure 46: Vaccine Utilization Monitoring Form – Health Facility Level (service delivery)

District: _____ Health Sub-District: _____ Health facility: _____ Month/Year: _____

Antigen	Start Balance	Doses Received	Doses given to other health units	Balance at end of month (VIMCB)	Number of children immunised (HMIS)	Number of Women Immunised (HMIS)	Number of children immunised (HMIS)	Doses Used (Accessed)	Doses wasted	Vaccine wastage rate	Reasons for Vaccine wastage *see footnotes below
					E		F	G	H	I	
	A	B	C	D	Under 1year	15 – 45 years	Above 1year	(A+B)-(C+D)	(G – E)	H/G X100	J
BCG											
Polio											
DPT-HepB											
Hib											
Measles											
TT											
Rota Virus											
Pnuemococcal Vaccine											
Human Papilloma Vaccine											
Hepatitis B Vaccine											

Reasons for wastage in order of highest cost-Temperature exceeding +8 degree Celcius =**1**, Temperature below 0 degree Celcius=**2**, Expired vials=**3**, Vials without labels=**4**, Vials missing diluent=**5**, Reconstituted vaccine remaining after g hours=**6**, Opened vials not used by end of session=**7**, Opened vials contaminated=**8**, Vials broken=**9**, Others (specify) =**10**

Comment on the commonest causes of vaccine wastage: _____

_____

Reporting Officer: _____ Title: _____

Signature: _____ Date: _____

13. CHAPTER | 13 | MANAGEMENT OF NARCOTIC DRUGS AND PSYCHOTROPIC SUBSTANCES

13.1. Introduction

Narcotic drugs and psychotropic substances refer to medicines that act on the CNS to relieve pain, produce sedation, induce sleep, can alter perception, behavior, motor or cognitive functions and have the potential for addiction and abuse. They are classified and specified in schedule 1 of the NDPA Act.

The common examples of narcotic drugs include codeine, dihydrocodeine, Fentanyl, heroin, methadone, morphine, oxycodone, pethidine, buprenorphine. Common examples of psychotropic substances include haloperidol, benzodiazepines, barbiturates, olanzapine, carbamazepine, sodium valproate, amitriptyline, phenobarbital among others. There are other examples of drugs that have a high potential for abuse and their use needs to be monitored. Examples of these drugs include ketamine, tramadol, and other drugs commonly used in anaesthesia.

13.2. Key considerations in inventory management of class A drugs

- For Narcotics drugs, the National annual estimate consumption shall be guided by the MOH through NDA which is responsible for relaying the information to the International Narcotic Control Board (INCB).
- Facility level quantification of these medicines is based on the established methods such as previous consumption, targeted number of new patients to be enrolled and consideration for safety stock.
- Receipt of the consignment of these drugs is at a designated facility store for bulk storage and shall be supervised by the responsible pharmacist or authorized personnel (pharmacy technician, or Health facility in charge under the supervision of a pharmacist)
- On a quarterly basis, the designated pharmacist or authorized personnel of the facility shall submit the quarterly returns form for class A medicines.
    - Health facilities under DLG shall submit to the office of DHO, who shall then submit to MOH -PNM,
    - Regional Referral and National Referral Hospitals shall submit directly to MOH-PNM,
    - PFPs and PNFPs shall submit directly to NDA.
- Issuance of class A drugs from the bulk follows a requisition from the pharmacist/ pharmacy technician who fills in the required amount in the HMIS PHAR 005 (Class A Medicine issue & requisition voucher book).

13.3. Storage and issue of narcotic drugs

These drugs should be:

- Stored in a premise with access restricted to only authorized personnel.
- Separated from other supplies in the store and kept under double lock and key in a DDA cupboard or a strong room.
- Access to the DDA cupboard or strong room, should be witnessed by an authorized third party and documented.

13.4. Dispensing of Narcotic drugs

The NDPA act, requires that dispensing of these drugs should be by a registered pharmacist against a prescription by a registered medical practitioner. These drugs can also be dispensed by a pharmacy technician under the direct supervision of a registered pharmacist.

During dispensing, strict observation should be made to eliminate any chances for diversion, under witness of a second qualified personnel and this transaction must be recorded in both the dispensing log and Narcotics drugs book. For injectable narcotic drugs, empty ampoules/containers must be returned to the inpatient pharmacy to confirm usage.

In case you interact with a client suspected of substance use disorder: -

- Section 29 of the NDPA requires all practitioners to neither prescribe nor dispense any medicine with risk of abuse to a person whom he or she knows or has reason to believe is addicted to any such drug unless he or she is authorized in writing to do so by the Minister.
- The same section requires that a record of all persons addicted to any drug specified in the First or Second Schedule is kept and submitted to the Minister every year.

13.4.1. Dispensing of Medicines to clients with substance use disorder

Clients with substance use disorder receive drugs to support them in their recovery process, most of these drugs require a supervised setting.

When dispensing narcotic drugs to patients on ward, use the HMIS PHAR 006: Ward/service delivery point class A medicines register. For dispensing in Medication Assisted Therapy (MAT) settings, refer to the pharmacy MAT tools/SOP attached.

Key considerations in dispensing of medicines to clients with substance use disorder include:

- Counselling the patient and his / her relative
- Validating the prescription and dispensing not more than a weekly supply at a time
- Refer the patient to a higher level of care for more specialized management.

13.4.2. Standard operating procedure for dispensing narcotics in a MAT clinic

13.4.2.1. Pre-Dispensing Procedures

- The pharmacist or pharmacy technician shall estimate the daily amount of controlled medicine to be dispensed using scheduled refills/visits of clients.
- In the presence of the MAT site leader or delegated MAT staff, the strong room shall be opened.
- The pharmacist shall then measure off the quantity of the controlled medicine required for the day from the bulk stock in the strong room.
- The pharmacist/delegated staff shall fill the required amount in the HMIS PHAR 005 (Class A Medicine issue & requisition voucher book).
- The estimated amount must be counter checked by the MAT site leader/delegated staff who shall append their signature.
- The pharmacist shall then close off with the MAT site leader/delegated staff.

13.4.2.2. Medicine Dispensing Procedure for OPD clients.

- Before opening of business, the pharmacist should ensure that the required quantity of controlled medicine as well as other supplies are available within the pharmacy.
- For methadone, take a portion of the quantity put aside for the day and fill in the dispensing pump.
- Receive client calmly and warmly from the clinician or any MAT staff.
- Do self-introduction to the client

Note that clients should not be allowed to bring bags or children to the dispensing window and if they do, kindly inform the security guard to take care of them.

- Receive the medicine prescription from the client or accompanying MAT staff.
- For a client who has a valid prescription in the pharmacy custody, check the validity of his/her prescription in the prescription registration part of the HMIS PHAR 003 (Daily Dispensing Log).
- Check for validity of the prescription, if it is prescribed by the recognized MAT clinician or countersigned by certified MAT clinician. The list of certified prescribers shall be shared by the MAT site lead.
- Verify the prescription to make sure it reflects the client (check his/her ID card)
- If the ID card/biometric system does not match with the prescription/treatment card of the client, ask the client to return to receptionist for identification/document to verify him/her before dispensing procedure.
- Validate the prescription by checking its correctness including the dose, duration, starting and ending dates.
- Counter check using client previous dose, if there are changes in the dose, get clarification from the clients and prescribing clinician to minimize human/prescribing errors.
- The dispensing pharmacy personnel shall sign the HMIS PHAR 003 (Daily Dispensing Log) followed by client signature/ finger printing.

For Methadone;

- Use either micropipette, syringe, or dispensing pump to measure required amount then put into the dispensing cup. A dispensing pump (a methameasure machine) is the most recommended.
- The pharmacist then dispenses the medicine to the client and ask him/her to swallow in front of you and identified counter checking pharmacy personnel or any other MAT staff or facility peer should witness and sign in the HMIS PHAR 003 (Daily Dispensing Log).
- Rinse the used cup with approximately 20 mls of water and ask the client to swallow in front of you.
- Instruct the client to wait in the pharmacy waiting area for a minimum of 30 minutes before leaving the MAT premises, if the client is new or re-enrolled client.
- In case a client is witnessed to vomit methadone solution, or he/she provides such vomiting report, inform the clinician about the event and request one day/ start prescription for vomited methadone (new prescription will be required to give methadone for repeated vomiting.)

For Buprenorphine;

- Check out the required number of tablets
- Open all packages along two sides and offer opened package to the clients to be individually placed in the mouth, starting with 8mg tablets first
- Clients should hold the tablets by their edge and place the first two under the tongue and the rest around the cheeks. They should not be stacked.
- Provoke/initiate talking to client to ensure that medicine has swallowed immediately.
- The pharmacy staff shall make sure that all the procedures are completed before you allow the client to leave the pharmacy window.
- After serving the last client, the pharmacist in presence of the MAT site lead shall measure/count the remaining controlled medicines in the pharmacy.
- The quantities are then filled in the HMIS PHAR 005 (Class A medicine issue & requisition voucher book).
- The MAT site team lead/delegated staff shall counter sign against the entries in the issue & requisition voucher book.
- The controlled medicines shall then be placed in the strong room in the presence of the MAT site lead/delegated staff.

- Medicines and Health Supplies are high value commodities with a continuous threat of theft, abuse, and misuse. The security of medicines must be ensured at all levels to prevent theft, abuse, and misuse.

13.5. Misuse of Drugs

Situations under which medicines are misused include the following:

1. Patients take medicines for a shorter time than prescribed and then give or sell the balance to others.
2. Patients write their own prescriptions by requesting repeat treatment on their outpatient cards.
3. Some people use their status within the community to make health facility staff feel obligated to supply them with medicines that they ask for.
4. Health facility staff may pilfer medicines.

When medicines are used without supervision, they can be used incorrectly or to treat the wrong condition, which can lead to—

1. The patient not being cured and the disease becoming more complicated and more difficult to treat. Improperly treated conditions, such as sexually transmitted infections, may lead to serious health complications (e.g., sterility or severe abdominal infections)
2. Drug resistance
3. Over or under dosing
4. Loss of life

13.6. Theft of Drugs

Medicines are costly and hence prone to theft. The storage and dispensing areas should be locked, and access limited to authorized personnel. Theft can occur when medicines or items are removed from a ward, dispensary, storeroom, or treatment room without the necessary authority, either by a staff member or an external thief.

13.6.1. How to Detect Theft

1. Through identification of discrepancies found in the monthly physical count
2. Evidence of a forced entry or attempted entry into the storage area.
3. Disorganization of the store, arising from a search

13.6.2. What to Do If Theft Is Discovered

Immediately a theft is suspected, the personnel in charge of the medicines store should:

1. Prepare and submit a report to the: (a) Health Facility In-Charge; (b) Inspector of Drugs of the National Drug Authority, and; (c) Nearest Police station, specifying the product name, the ingredients and quantities of the drug or particulars of the products lost.
2. Report to the following help lines:
3. +256417788100 / +256417788124 / +25641788129

It is important to report theft to—Replace or Recover the goods

1. Justify the need for strengthening physical storage facilities
2. Quantify the magnitude of the theft in a given period
3. Influence decision making and policies regarding theft.

13.7. Wastage of Medicines

Avoiding waste results in substantial savings of stock and money. Below are some causes of wastage:

- Storing medicines poorly by exposing them to heat, light, and moisture.
- Letting medicines expire or not redistributing short-dated medicines; avoid this by keeping good stock control and filling in the stock cards.
- Giving too many medicines to one patient on one prescription (poly pharmacy).
- Prescribing without a proper diagnosis.
- Prescribing ineffective medicines for a given condition.
- Failing to advise a patient on proper application/administration of medicines.
- Not following the Uganda Clinical Guidelines.
- Allowing easy access to classified medicines.

KEY POINTS

1. Misuse and abuse of medicines leads not only to wasted resources but may lead to addiction and negative social consequences such as increased antibiotic resistance.
2. Health workers should put measures in place to prevent misuse by strictly following guidelines for storage and dispensing of medicines with high potential for misuse and abuse.
3. Medicines are costly and hence prone to theft. The storage and dispensing areas should be locked, and access limited to authorized personnel

14. CHAPTER | 14 | COMMUNITY HEALTH SUPPLY CHAIN SYSTEM

14.1. Introduction

The Ministry of Health has long recognized the need to take essential health services down to the community level in order to increase coverage and better reach under-served groups, marginalized, and special target populations. As such, the National Medicines Policy provides for access to essential commodities at community level, leveraging community health workers trained to support specific public health programs. This section describes the institutional arrangements to extend the supply chain beyond the health facility to service community health programs.

Community health supply chain entails the processes include selection, ordering, receiving, storage, distribution of essential medicines and health supplies for use in community health programs, and their storage, dispensing and reporting returns from the community level.

Commodities for use in community health programs are received and recorded into stock cards in the health facility store and issued out to community health workers by respective focal persons at the health facility. Subsequently, the community health worker accounts for their utilization through the consumption log and reports on clients served and products consumed, in-charge appoints a focal person (usually a health assistant) responsible for interactions.

The actors are at national, district, health facility and community levels. There are three actors at the interface between the community level and the health facility: the community health worker, the CHEW/Parish Coordinator and health facility focal person. The Community Health Strategy defines a community health worker as a frontline public health worker and aides selected, trained, and working in the communities from which they come through a variety of tasks such as home visits, sanitation, first aid, MNCH and family planning activities, TB and HIV/AIDS care etc.

14.2. Health Products Available through Community Health Programs

The community supply chain section addresses different public health interventions for the delivery and accountability of an ever growing range of commodities used in outreaches, community-based programs targeting access to family planning, HIV, TB, malaria, public health emergencies, iCCM and episodic mass drug administration for a range of neglected tropical diseases among others.

Table 25: Routine processes/services and respective products at community level

No.	Processes/services	Products at community level	Reference MoH Policy/Guideline
1	iCCM (Diarrhea, Malaria and Pneumonia)	ORS+Zinc, mRDT, Artemether/Lumefantrine, Rectal Artesunate, Dispersible Amoxicillin, Gloves, Safety box	National Community Health Strategy ICCM implementation guidelines
2	Family Planning	DPMA (SC), Condoms, Oral Contraceptive pills (COCs, POPS, Emergency pill)	National Community Health Strategy National Family Planning Costed Implementation Plan 2020/21- 2024/25 Reproductive Health Commodity Security Strategy
3	Community HIV/TB care and treatment services	Self-HIV test kits, ARVs and condoms	Consolidated Guidelines for the Prevention, Care and

No.	Processes/services	Products at community level	Reference MoH Policy/Guideline
			Treatment of HIV and AIDS in Uganda, 2022 National Condom Distribution Guidelines, 2022
4	Community outreaches	Vitamin A, Albendazole, Mebendazole	

14.3. Pillars of successful community supply chain program

Ordering, Receipt, dispensing, and stock counts and adjustments on commodities in the community health programs must immediately be recorded in the MoH standard HMIS tools for traceability, accountability and reporting.

The use of standardized community supply chain HMIS tools introduces a demand-based supply system for community health programs. As a result, the quantity to resupply individual CHWs should match the historical client load and consumption data.

This undertaking is only possible if the following conditions/principles are met.

1. Community health workers should keep daily records of commodities received, dispensed, and clients served. The use of the tools should be reviewed at each point by respective supervisor(s)
2. Community health workers should obtain their medicines and health supplies from the nearest health facility to which they are attached. Special arrangements may be made for condoms that are picked from designated points e.g., district stores. Community health workers should be re-supplied once every two months or whenever they require additional supply as need arises.
3. The date and time for supply should be communicated in advance and the entire resupply process done for the CHWs as a group. The health facility should as much as possible schedule the supply date to occur at a time when there is likely to be stock at the site so that they are in position to fulfil the requirements of the CHWs. For instance, this could be 1-2 weeks after the NMS delivery deadline for the district.
4. Community health workers should submit records for clients reached from their VHT register together with the Daily Community Consumption Log (HMIS VHT 003) data to the Parish Coordinators. The health worker should review whether the number of clients reached matches the reported consumption for the period. Synchronizing these reports also creates efficiency in the system for both the community health workers that may need to visit the health facility, and for the health facility where 1-2 health workers may take out time from their schedule for the supervision and resupply of VHTs.
5. Community Health Workers should ensure appropriate medicines use with regards to; right medicine for the right patient for the right condition in the right doses and the right instructions given to the patient.
6. The Community Health workers should ensure that the medicines and health supplies received are stored in recommended pharmaceutical conditions (medicine boxes) to guarantee that the quality is not compromised.
7. Community Health Workers should return expired, damaged medicines, supplies and pharmaceutical waste to the health facility for appropriate destruction.

14.4. Data Collection and Reporting

This section provides an overview of the primary data collection and reporting tools for medicines and supplies used to support community health supply chain.

14.4.1. HMIS VHT 003 Daily Community Consumption Log

This is the primary tool that records all the medicines and supplies available or dispensed to the users in the community. At the end of every month and each reporting period, the community health worker conducts a physical count of the items in stock and reconciles with Daily Community Consumption Log and VHT/CHW Register. The community health worker presents the Consumption Log to the CHW/Parish Coordinator at the end of the reporting period who then reports to the health facility.

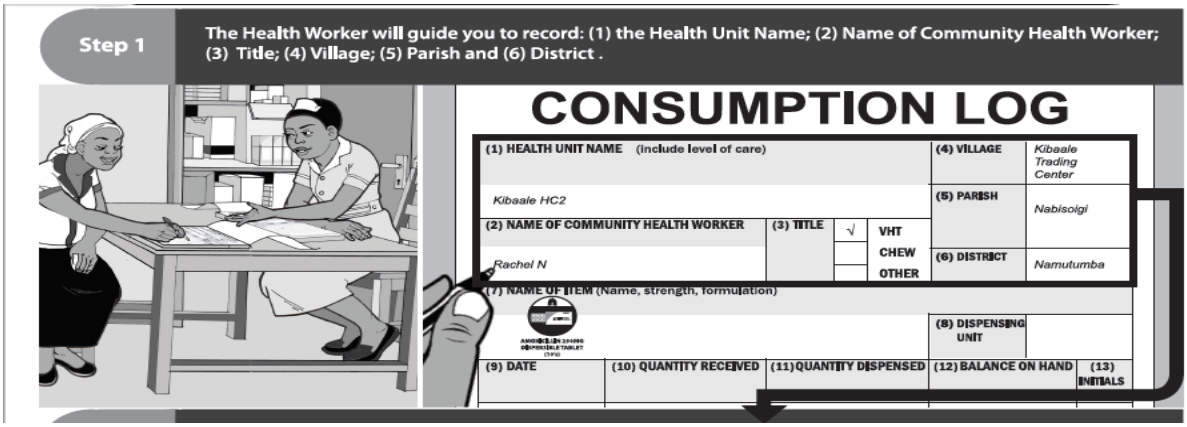
14.4.1.1. How to Fill the Consumption Log

The Consumption Log is the primary tool to record all the medicines and supplies available or dispensed to patients in the community. It is filled together with the program's register. The community health worker must update the Consumption Log whenever one receives or dispenses medicines and health supplies. The Consumption Log is also updated when recording expired/damaged items and physical counts.

Steps to follow

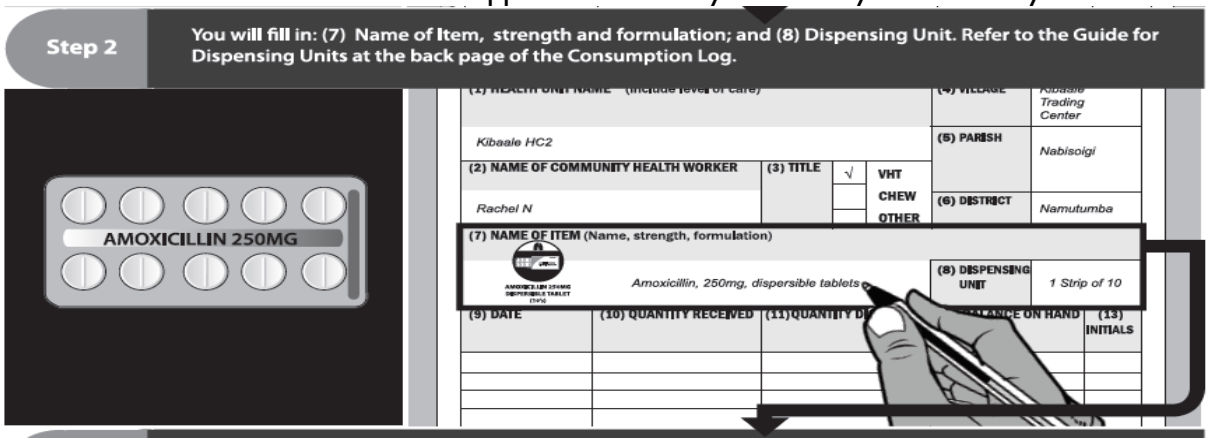
Refer to Card# 5 - "How to Fill the Consumption Log" of the community health worker's Medicines Management Job Aid included in the Consumption Log.

Step 1: Record (1) Health Unit Name; (2) Name of the Community Health Worker; (3) Title (either VHT, CHEW or health facility staff); (4) Village; (5) Parish; and (6) District to which the VHT is attached.

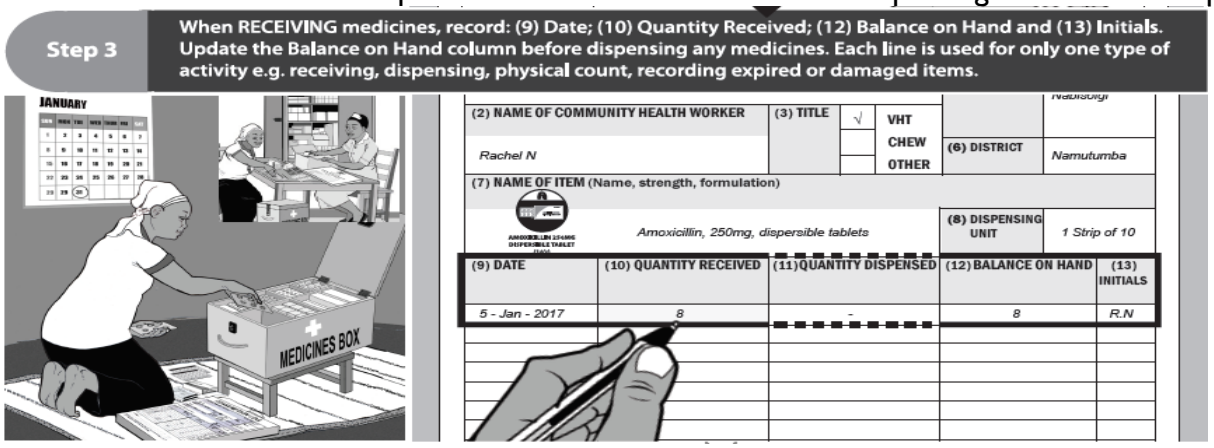


Step 2: For each item, available in the medicine box, fill in (7) Name of item, its strength and formulation (8) Dispensing Unit. Refer to the back of the Consumption Log for a guide on dispensing

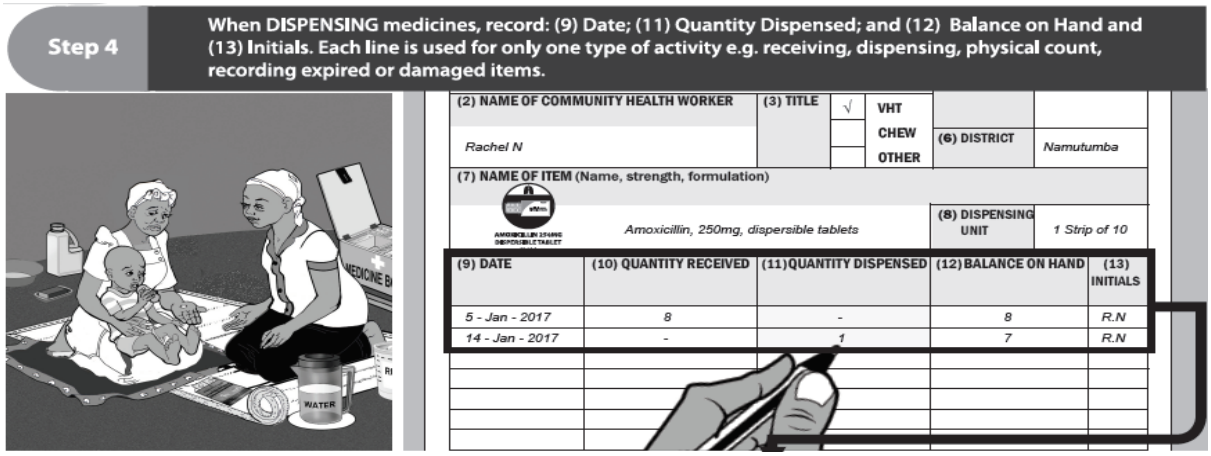
units for the medicines and supplies commonly used by community health workers.



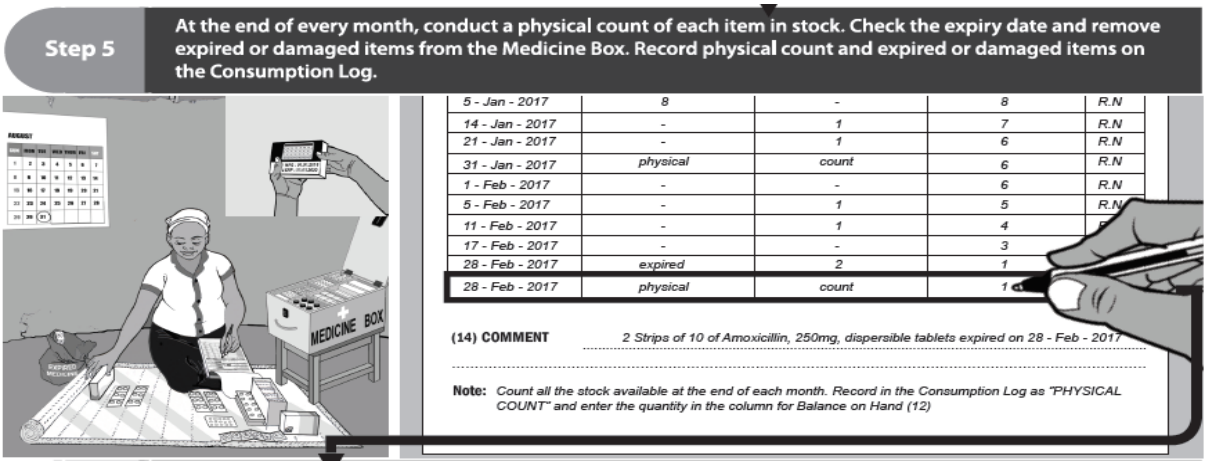
Step 3: When receiving, the VHT should record (9) The Date; (10) Quantity Received; and (12) the Balance on Hand. Note: Update balance on hand before dispensing to client or patient.



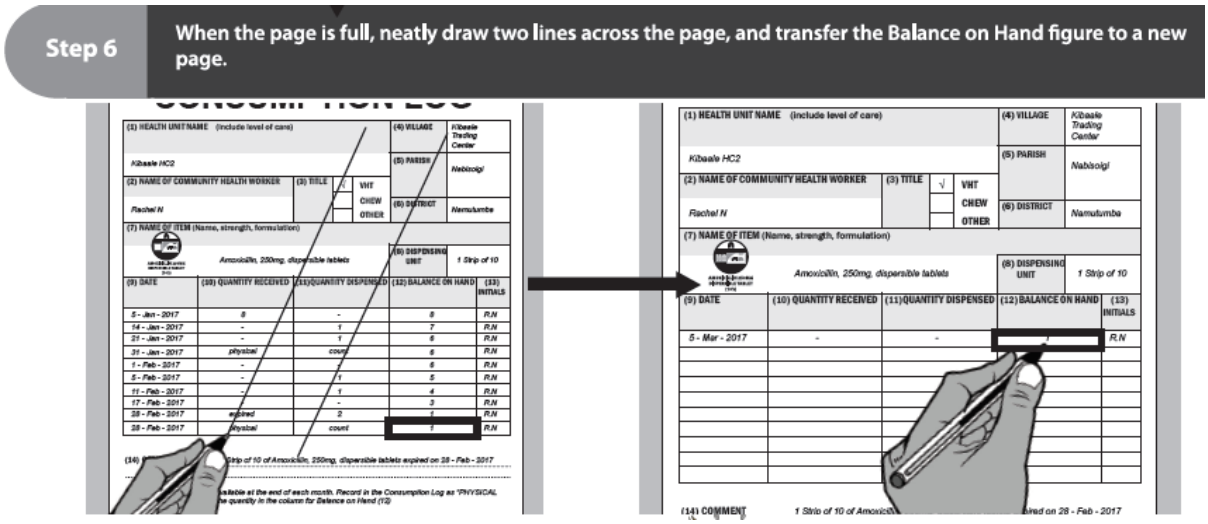
Step 4: When dispensing, VHT should record (9) The Date; (11) Quantity Dispensed; and (12) Balance on Hand.



Step 5: At the end of every month, conduct a physical count of each item in stock. Check the expiry date and remove expired or damaged items from the medicine box. Record physical count. Record the expired or damaged items under "quantity dispensed" in the consumption log.



Step 6: When the page of the Consumption Log is full, neatly draw two lines cross the page, and transfer the Balance on Hand figure to a new page. Ensure you fill in all the header information for this new page.



Fill out the Consumption Log immediately after dispensing to each client. Fill out a separate Consumption Log for each item that the VHT handles. If the pack sizes differ, fill out separate Consumption Logs.

14.4.2. Summary Form For Consumption And Requisition (HMIS VHT 004)

This tool is used to summarize the quantity dispensed over the previous two months and stock balance for each item from individual Consumption Logs of each community health worker by the CHEW/Parish Coordinator. In addition, the Parish Coordinator determines the optimal quantity to resupply for each item using the Magic Calculator. Once these are compiled for all the community health workers in the parish, the CHEW/Parish Coordinator submits the Dispensed, Stock Balance & Request Summary to the health facility focal person from the parish. The health facility focal person reviews and approves the Dispensed, Stock Balance & Request Summary.

14.4.3. Magic Calculator (HMIS VHT 005)

This is the tool that is used by the parish coordinator/ community health worker supervisor to quantify the quantity of a particular drug needed to be supplied by the health facility to the community health worker. This tool is used to compute the quantity to supply every time the Summary Form for Consumption and Requisition (HMIS VHT 004) is filled.

14.4.4. Requisition and Issue Voucher (HMIS 017)

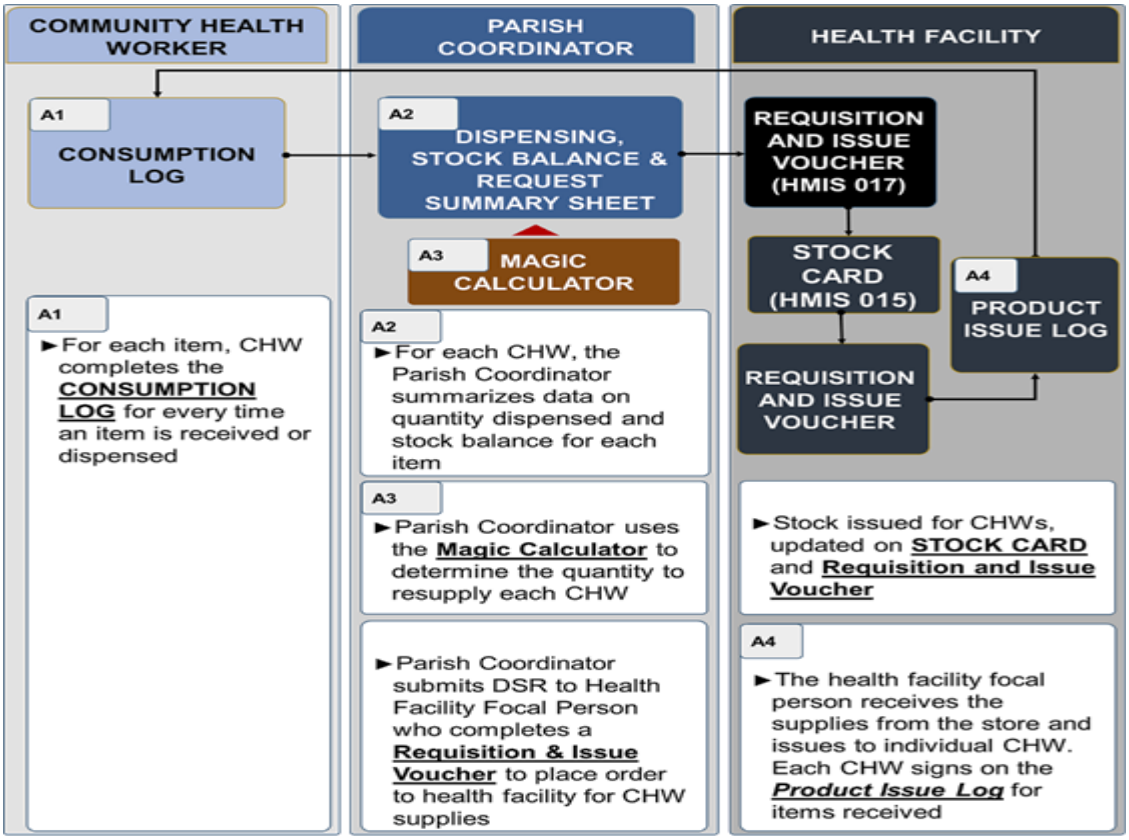
This tool is used to generate an order by the health facility community health supervisor. . The health facility focal person uses data from the Dispensed, Stock Balance & Request Summary to complete the Requisition and Issue Voucher (HMIS 017). The health facility in-charge reviews the order for correctness and accuracy, submits Requisition and Issue Voucher to the store personnel. Stock is then issued from the store to the health facility community health supervisor focal person and recorded on a stock card.

14.4.5. HMIS VHT 002 Community Product Issue Log

Once stock is issued from the store to the health facility focal person, he/she issues the stock to individual community health workers at the health facility. Each community health worker signs on the Product Issue Log for items received.

Simple illustrations of the processes that a community health worker follows in the management of the medicines and health supplies have been developed. These are packaged into five cards in the Medicines Management Job Aid.

Figure 47: Flow of EMHS information from community health worker to health facility



14.5. Inventory management at the health facility

- All medicines and health supplies for community health workers must first be delivered to the health facility – never directly to community health workers.
- Health facilities should maintain one stock card policy, ensuring that it is possible to retrieve information on what was received for CHWs and what is issued for use in community health programs. This will guide integrated quantification of both health facility and community needs.
- Stock issued from the health facility for use by community health workers should be captured in the appropriate stock card.

- Proper and complete documentation should be done to enable tracking and accountability for commodities received and used in community health programs. The key stock keeping records are the Summary Form for Consumption and Requisition, Product Issue Log and stock card.
- When consumption of community health programs is reflected in the stock card, it is then possible for the health facility to plan for the needs of community health workers in the routine ordering and annual procurement planning.
- The expired medicines returned by the community health workers should be recorded in the expiry log and isolated with the other expired medicines.

14.6. Storing medicines and health supplies

Refer to Medicines Management Job Aid: Card #2 – "How to Properly Store your medicines at home".

Figure 48: Storing medicines at home

14.6.1. Keep all medicines and health supplies in the Medicine Box

Health facilities have stores where medicines and health supplies are stored. In the community, the CHW will be provided with a medicines box, where all medicines and health supplies must be stored at all times. For community pharmacies, medicines should be stored on shelves/cupboards.

14.6.1.1. Features of a typical Medicines Box

1. Preferably made of wood to maintain temperatures in and around the products.
2. Has compartments that allow separation of products.
3. Locks for security.
4. Do not keep any other items in the Medicines Box
5. Regularly clean the Medicine Box to keep pests away

14.6.2. Maintain proper storage conditions for medicines and health supplies

- It is important to keep all your medicines and health supplies inside the Medicines Box at all times. This will help you maintain the recommended storage conditions.
- Place the Medicines Box on a stool or table. The Medicines Box must not be kept on the floor
- Keep the Medicine Box in a cool, dry place away from direct sunlight
- Avoid high temperatures/heat. Do not cook near the Medicines Box
- Avoid humidity/water vapor

14.6.3. Use best storage practices for medicines kept at home

1. Maintain a clean and organized Medicines Box.
2. Use the compartments to separate the different items and keep them well arranged inside the Medicine Box
3. The Medicine Box should be locked and kept out of reach of children and visitors.
4. At the end of each month, conduct a physical count for all items in the Medicines Box and update the Consumption Log
5. Check that none of the products are damaged or expired.
6. Separate damaged/expired items from the viable stock. Place these in a biohazard bag, and carry it with you when you next go to the health facility. Remember to always keep the biohazard bag away from the reach of children and visitors.

14.7. Supervision and Performance Monitoring

Overall Overall implementation of the system requires that all stakeholders have the required knowledge of the community health program, supply chain procedures and tools. The supervision process ensures that there is continuous identification of knowledge and skills and support provided to address implementation gaps. Through this process, we learn from each other and identify best practices that can be scaled particularly for community health workers and health facilities and district staff. The supervision process is conducted at national, district, health facility and community level.

Support supervision is one way through which we identify implementation challenges and enhance the knowledge and skills of health facility and community health workers to improve and sustain quality of service. Support supervision for community health programs can be provided by health personnel at different levels as shown below: The Support supervision structure:

- National level to District health office
- District Health Office to Health facility
- Facility health workers- to community health workers; during re-supply meetings
- Peer-to-peer; CHW/Parish Coordinators can supervise their fellow community health workers in their homes.

Support supervision for community health workers should preferably be conducted through on-job mentorship and at meetings held at the health facility. A set of indicators have been defined for routine monitoring of the performance of the community supply chain such that support supervision can be targeted to address the most predominant areas of weakness. The supply chain indicators will enable the supervisor to obtain information on the following.

- Capacity to complete the community supply chain tools
- Availability of medicines and health supplies
- Availability of record keeping tools and medicines management aids
- Submission of program reports
- Use of community supply chain data in the decision-making process

14.7.1. Frequency of supervision

It is recommended that support supervision for community health supply chain be integrated into the routine supply chain support supervisory activities and existing community health programs like iCCM, family planning among others with commodity requirements. Integrated support supervision is conducted quarterly where service gaps are identified and reported to the technical team for action.

15. CHAPTER | 15 | MANAGING NATURAL MEDICINES

The management of natural medicines involves several key considerations, including procurement, storage, dispensing, administration, documentation, and monitoring. Natural medicines refer to herbal, traditional, and complementary medicines that are derived from natural sources, such as plants, animals, and minerals, and are used for therapeutic purposes.

15.1. Classification of Natural medicines

Natural medicines can be classified in various ways depending on the criteria used for classification. Here are some common classifications of natural medicines:

15.1.1. Herbal medicines

Herbal medicines are derived from plants and are used for medicinal purposes. They can be classified based on the plant part used (e.g., leaves, flowers, roots, bark), the plant species, or the active constituents present in the plant.

15.1.2. Traditional medicines

Traditional medicines are practices, knowledge, and beliefs related to health and healing that are indigenous to a specific culture or region. They often involve the use of natural medicines, such as herbs, animal products, or minerals, and are passed down through generations.

15.1.3. Ayurvedic medicines

Ayurvedic medicine is a traditional system of medicine that originated in India and is based on the use of herbs, minerals, and other natural substances. Ayurvedic medicines can be classified based on their intended use, such as medicines for digestion, immunity, or respiratory health.

15.1.4. Homeopathic medicines

Homeopathic medicines are based on the principle of "like cures like," where a substance that can cause symptoms in healthy individuals is used in a highly diluted form to treat similar symptoms in diseased individuals. Homeopathic medicines can be classified based on the source of the substance used (e.g., plant, animal, mineral), the potency or dilution level, and the specific symptoms they are intended to treat.

15.1.5. Traditional Chinese medicines

Traditional Chinese medicine (TCM) is a holistic system of medicine that includes the use of herbal medicines, acupuncture, and other modalities. TCM medicines can be classified based on the traditional Chinese medicinal principles, such as yin and yang, the Five Elements, or the meridian system.

15.1.6. Naturopathic medicines

Naturopathic medicine is a system of medicine that emphasizes the use of natural therapies, such as herbs, nutrition, and lifestyle changes, to promote healing and prevent disease. Naturopathic medicines can be classified based on their intended use, such as medicines for detoxification, hormonal balance, or immune support.

15.1.7. Dietary supplements

Dietary supplements are products that contain vitamins, minerals, herbs, or other natural ingredients and are taken orally to supplement the diet. They can be classified based on the specific nutrients or ingredients they contain, their intended use (e.g., multivitamins, probiotics, antioxidants), or their form (e.g., capsules, tablets, liquids).

15.1.8. Essential oils

Essential oils are concentrated plant extracts that are used for their aromatic and therapeutic properties. They can be classified based on the plant species, the method of extraction, or the specific properties they possess (e.g., calming, energizing, antiseptic).

15.2. Supply Chain Considerations for Natural Medicines

Here are some key aspects of the management of natural medicines in facilities.

15.2.1. Procurement

Health facilities in Uganda need to ensure that natural medicines are procured from reliable and reputable sources. This involves verifying the quality, safety, and efficacy of the natural medicines through appropriate quality control measures, such as checking for product registration, certification, and standardization.

15.2.2. Storage

Proper storage of natural medicines is critical to maintain their quality and potency. Health facilities need to ensure that natural medicines are stored in appropriate conditions, including temperature, humidity, and light, as per the manufacturer's instructions. This may involve dedicated storage areas with controlled environments and adequate security measures to prevent theft or unauthorized access.

15.2.3. Dispensing

Dispensing of natural medicines should be carried out by trained and qualified personnel, such as pharmacists or trained herbalists. The dispensing process should include appropriate labeling, dosage instructions, and patient counseling on the proper use of natural medicines, including potential side effects and interactions with other medications.

15.2.4. Administration

Natural medicines should be administered to patients as per the prescribed dosage and schedule. Health facilities should have clear guidelines and protocols for the administration of natural medicines, including appropriate routes of administration, monitoring of patient response, and management of any adverse reactions.

15.2.5. Documentation

Accurate documentation of the use of natural medicines is essential for patient safety and legal compliance. Maintain proper records of natural medicines procurement, storage, dispensing, and administration, including patient information, dosage, and duration of treatment.

Monitoring: Regular monitoring of the use of natural medicines is important to assess their safety and efficacy. This may involve conducting post-marketing surveillance, adverse drug reaction reporting, and periodic audits of natural medicines management practices. Any adverse events or incidents related to natural medicines should be reported, investigated, and addressed in a timely manner.

15.2.6. Education and Training

Provide ongoing education and training to healthcare professionals, including pharmacists, nurses, and other relevant staff, on the appropriate management of natural medicines. This may include training on herbal medicine identification, quality control, and safe use, as well as patient education on the proper use of natural medicines.

15.2.7. Collaboration with Traditional Healers

Traditional healers are an important part of the healthcare system in Uganda, and they commonly use natural medicines. Establish collaborative relationships with traditional healers to promote safe and effective use of natural medicines, including communication channels for referral, consultation, and sharing of information.

15.2.8. Regulatory Compliance

Comply with relevant national and international regulations and guidelines for the management of natural medicines. This may include adherence to the National Drug Authority (NDA) regulations.

15.2.9. Storage Natural Medicines

Natural Medicines shall follow the same inventory management process as those of Essential Medicines. Refer to CHAPTER | 6 | STORAGE

16. CHAPTER | 16 | GUIDANCE ON EXTEMPORANEOUS PREPARATIONS

16.1. Introduction

The purpose of this guidance is to assist pharmacists (or other health workers under direct supervision of the pharmacist) in the preparation of safe and appropriate extemporaneous products and ensuring their availability in health facilities where the need of such products becomes necessary.

Extemporaneous preparation refers to the process by which a pharmacist, using traditional compounding techniques, produces a pharmaceutical product or health supplies to meet the special needs of a health facility in instances where it is unavailable.

Pharmacists must always be satisfied that any products they prepare are safe and fit for purpose both at the time of preparation, supply to the facility and throughout their expected shelf life. In addition, the pharmacist must always make a written record as to its preparation. This should include the precautions taken to ensure that the product is of the character required and of the particular reasons that necessitated its preparation and supply.

Extemporaneous preparation is for local use. These products should not be sold.

16.2. Rationale for Extemporaneous preparation

In the event that the warehouse (NMS and JMS) cannot meet the demand or desired concentrations of some items such as infection prevention and control (IPC) materials (Alcohol sanitizer, Sodium hypochlorite, Hydrogen peroxide 6 – 10%, liquid soap, Cetirimide); Ultrasound scan gel, capable health facilities can set up local production units to make the stated extemporaneous preparations as the need of such products becomes necessary.

This is subject to: -

1. The list of equipment, raw materials and specifications of what is to be produced
2. The facility's financial capabilities to procure equipment and raw materials
3. Availability of capable human resource (Pharmacist or Pharmacy technician)
4. Availability of raw materials for preparation
5. Production management system including forecasting for raw materials
6. Master product formulae for the items to be produced
7. Availability of SOPs and training manuals
8. Operationalization of Quality management systems.

16.3. Supply Chain Considerations

16.3.1. Risk Management

It is important in this context to consider the potential risks that are associated with the extemporaneous preparation of pharmaceutical products or supplies in health facilities. For example, risks from:

- Calculation errors
- Formulation failures
- Microbial contamination
- Inappropriate starting materials
- Labelling errors
- Health and safety issues

NOTE

Smoking, eating, drinking, chewing, and keeping plants, food, drinks, smoking material or any other product that may compromise the quality of the manufactured product is restricted in the production areas.

16.3.2. Validity of the Formulation

Requirements/specifications for routinely used formulations are the primary reference used in extemporaneous preparations and dilution; such records may not be current or appropriately referenced. Pharmacists must ensure that they are satisfied with the on-going validity of the formulation in use, from a quality, safety and efficacy perspective.

16.3.3. Expiry dates

After preparation, an appropriate expiry date should be included in the labelling of the product. The pharmacist should be satisfied that the expiry date applied is appropriately justified. Once the container is opened, it may be necessary to apply a clinically justified in-use expiry date following the manufacturers recommendations or basing on the properties of the product.

16.3.4. Labelling

Extemporaneously produced pharmaceutical products or supplies should be appropriately labelled in accordance with the requirements. Labels for extemporaneous products should be prepared before the product is compounded, to allow the product to be labelled as soon as it is prepared and avoid potential mislabeling or dispensing errors.

The labelling for extemporaneously dispensed products should include:

- the name and address of the health facility/pharmacy,
- the name of the patient (if applicable),
- the date on which the product was prepared/dispensed,
- the name of the product,
- the quantity of the product supplied,
- full qualitative composition and the quantity of the active substance,
- directions on the use of the product,
- batch number, if applicable,
- relevant precautions 'Do not apply on open wound, or mucous membranes'
- Warnings 'Keep out of the reach of children',
- route of administration e.g. 'For external use only',
- expiry date (including an in-use expiry date as appropriate) or information about limits for use,
- Special storage conditions or handling precautions e.g. for certain liquid preparations 'Shake well before use'.

16.3.5. Record-keeping

A clear record in respect of each extemporaneously prepared product must be kept to ensure full traceability of the ingredients, formulae and method used, and the names of all pharmacist and staff members involved. The information to be recorded should be clearly documented in a written procedure. A recall procedure should be in place in case a defect or error is identified and the product has to be returned to the pharmacy.

16.3.6. Appropriate Facilities/ Equipment

All areas used in extemporaneous dispensing should be clean, disinfected, orderly and well lit. All starting materials and finished product should be appropriately stored, to avoid mix-ups and/or cross contamination. Diluted solutions should be kept in cleaned containers and they should not be stored for long periods unless sterilized and chemical stability has been established.

Equipment used in these processes should be appropriately stored, handled, maintained and calibrated. Consideration should also be given to the type of container used to supply/dispense the product.

An appropriate method of disposing wastes should be established and documented; wastes should not accumulate in the preparation area.

16.3.7. Testing

Appropriate testing methods should be implemented to ensure that the desired quality is achieved such as appearance of the products, identity and purity tests, uniformity and reference standards. Recommended measuring equipment should be used to confirm the above parameters before issue.

At a minimum, the starting materials and finished products should be examined visually before use or supply/dispensing to the facility/patient.

16.3.8. Education and Training

All staff involved in this service should be appropriately trained and the pharmacist must ensure that all staff involved maintain the necessary competence in this area. All training should be appropriately documented.

16.3.9. Standard Operating Procedures (SOPs)

Adequate SOPs and quality assurance systems should be in place to ensure that products are consistently prepared to appropriate quality standards.

17. CHAPTER | 17 | LOGISTICS MANAGEMENT DURING EMERGENCIES AND IN HUMANITARIAN SETTINGS

17.1. Introduction

A humanitarian setting is regarded as one in which an incident or series of incidents such as a natural disaster or human induced conflict disrupts the local capacity to respond and requires a multi-sectoral response to avoid significant loss of life and property. Typically, it affects a significant percentage of people.

17.2. Uniqueness of a Humanitarian Setting Supply Chain Response

There are a number of key differences between supply chain responses in normal and humanitarian settings. These include:

- The objective is to reach populations with the greatest need first in a timely and effective manner.
- Requirement of large volumes of commodities over a short period of time often with uncertainty in demand volumes.
- Multiple stakeholders (government, non-government, and community organizations) of various capacities are required to support the response.

Figure 49: Classification of hazards

Generic Groups 1	1. Natural						2. Human-Induced[2,3]	
Groups	1.1 Geological[4]	1.2 Hydro-meteorological			1.3 Biological[5]	1.4 Extraterrestrial[4]	2.1 Technological	2.2 Societal
Subgroups		1.2.1 Hydrological[4]	1.2.2 Meteorological[4]	1.2.3 Climatological[4]				
Main Types - subtypes [sub-subtypes]	Earthquake (G1): - Ground Shaking - Tsunami Mass movement (G2) Liquefaction (G3) Volcanic activity (G4): - Ash Fall - Lahar - Pyroclastic Flow - Lawa Flow	Flood (H1): - Riverine flood - Rash flood - Coastal flood - Ice jam flood Landslide (H2): - Avalanche [snow, mud flow debris, rockfall] Wave action (H3): - Rogue wave - Seiche	Storm (M1): - Extra-tropical Storm - Tropical Storm - Convective Storm [e.g storm/surge, tornado, wind, rain, winter storm/blizzard, Derecho, lightening/ thunderstorm, hail, sand/dust, storm] Extreme temperature (M2): - Heatwave - Cold wave - Severe winter condition [e.g. snow/ice, frost/ freeze] Fog (M3)	Drought (C1) Wild Fire (C2): - Land Fire [e.g. Brush, bush, pasture] - Forest Fire Glacial lake outburst (C3)	Emerging diseases (B1) Epidemics and pandemics (B2) Insect Infestation (B3):[4] - Grasshopper - Locusts Foodborne outbreaks (B4)[7]	Impact (E1): - Airburst Space Weather (E2): - Energetic Particles - Geomagnetic Storms - Shockwave	Industrial hazards (T1):[8] - Chemical spill, Gas leak, Collapse, Explosion, Fire, Radiation Structural collapse (T2):[8,9] - Building collapse, Dams/ bridge failures Transportation (T3):[8,11] - Air, Road, Rail, Water Explosions/Fire (T4)[8] Air pollution (T5):[9] - Haze[10] Power outage (T6)[11] Hazardous materials in air, soil, water (T7):[12,13] - Biological, Chemical, Radionuclear Food contamination (T8)[7]	Armed conflicts (S1):[14] - International - Non-International Civil unrest (S2) Terrorism (S3) - Chemical biological, - radiological, nuclear,and explosive weapons (CBRNE) (S4)[15,16] - Conventional weapons - Unconventional weapons Financial crisis (S5): - Hyperinflation - Currency crisis

Source: The WHO Emergency Response Framework [ERF] 2nd Edition Page 66

17.3. Government Policy Framework

Emergency response within the country should be conducted in line with the existing government policies and guidelines. Currently, hazard/emergency response in Uganda is guided by the following policies and guidelines.

1. WHO Emergency Response Framework
2. The National Policy for Disaster Preparedness and Management
3. National Multi-Hazard Preparedness and Response plan
4. National Medical Countermeasures Plan for Public Health Emergencies
5. Public Health Emergency Operations Centre Manual Handbook
6. Public Health Emergency Operations Centre Standard Operating Procedures (SOPs)

7. The Health Sector Integrated Refugee Response plan 2019 - 2024

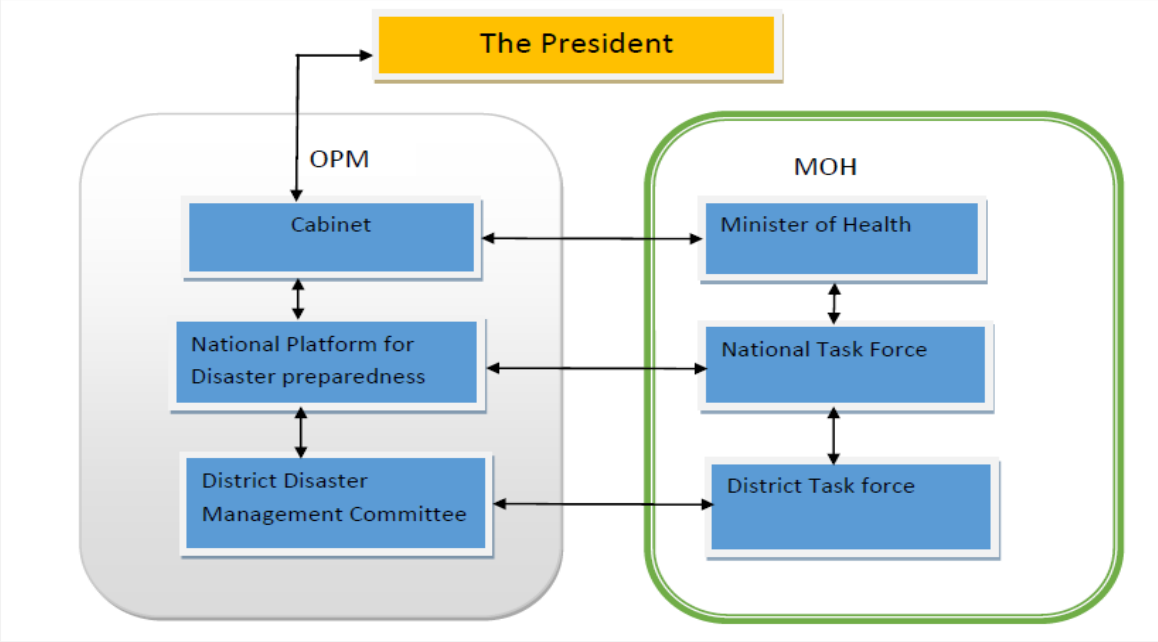
17.3.1. The National Policy for Disaster Preparedness and Management

This policy places the mandate to handle all hazards/emergencies in the country under the Department of Relief, Disaster Preparedness and Management which falls under the Office of the Prime Minister (OPM) of the Republic of Uganda. The department will coordinate the National Emergency Coordination and Operations Centre (NECOC) to respond to emergencies nationally. The policy further places specific responsibility of responding to public health related emergencies under the Ministry of Health (MOH) with support from the Ministry of Agriculture, Animal industry and Fisheries (MAAIF) for emergencies resulting from zoonotic diseases.

17.3.2. The National Multi-hazard Preparedness and Response Plan

Hazard response under MOH is guided by the National Multi-hazard Preparedness and Response Plan. Under this plan, the Public Health Emergency Operations Centre (PHEOC) supports the NECOC to respond to public health threats. Activities of the PHEOC are implemented by the National Task Force (NTF) at national level and the District Task Force (DTF) at district level. At district level, the District Emergency Preparedness Response Committee (DEPRC) manages response to hazards and in the event of a public health threat, the DEPRC is converted into the District Task Force (DTF). The DEPRC committee performs its functions through technical sub-committees that are composed of experts in that particular area of intervention. These sub-committees are responsible for the technical aspects of the response and control measures in the district.

Figure 50: Structure of emergency preparedness and response in Uganda



Source: National Multi-hazard preparedness and Response[6]

[6] Uganda Ministry of Health, 2016. National Multi-hazard preparedness and Response Plan -2016-2020

Figure 51: Committees of the National Task Force

Source: SOPs and Guidelines for Responding to Ebola/Marburg Virus Disease Outbreaks in Uganda[7]

17.3.3. The National Medical Countermeasures Plan for Public Health Emergencies

This plan is an inter-ministerial and interdepartmental effort towards achieving the 5-year Global Health Security Agenda (GHSA) targets for medical countermeasures and personnel deployment action package. It is implemented under the *one health* platform. The purpose of this plan is to provide an operational framework for the Ugandan government to establish and manage a national supply chain system for the procurement, storage and distribution of critical medicines and health supplies (medical countermeasures (MCMs)) to combat public health threats. These threats include priority zoonotic disease outbreaks like anthrax, zoonotic influenza viruses, Viral Hemorrhagic Fevers (VHFs), brucellosis, trypanosomiasis, plague, and rabies. Water, Sanitation and Hygiene (WASH)-related disease outbreaks such as cholera, and biological and chemical attacks are also important public health threats. Under this plan, the Ministry of Health is responsible for identifying, declaring and responding to public health emergencies in the human health sector, and managing MCMs in the emergency.

17.4. Supply Chain Management During Public Health Emergencies

A public health emergency (PHE) poses a substantial risk to humans by causing a significant number of fatalities or long-term disability among the population in a given community.

Thus, the need for supply chain management readiness for public health emergency response is unquestionable. Every country must have a comprehensive emergency preparedness and response plan that includes a resilient and responsive supply chain management system. Emergency supply chain management planning involves but is not limited to:

- Developing a national stockpile strategy
- Strengthening the national PHE supply chain management coordination mechanism
- Strengthening PHE supply chain management systems and the capacity for public health emergency response actors.

Effective PHE supply chain management mechanism provides the basis for mobilizing resources before emergencies and allows the government to prioritize maintenance and functionality of the emergency supply chain management to respond to an outbreak rapidly and effectively whenever and wherever it occurs.

[7] Uganda Ministry of Health, 2015. Standard Operating Procedures and Guidelines for Responding to Ebola/Marburg Virus Disease Outbreaks in Uganda; A Guide for National Response.

17.5. Organizational Structure for PHE Supply chain management in Uganda

The organizational structure of the PHE system in Uganda is led by the National Task Force (NTF) for Emergency Preparedness and Response headed by the OPM. It is a multi-sectoral and multidisciplinary task force. The NTF's Logistics Sub-Committee spearheads the coordination of the PHE logistics functions. The sub-committee is multisectoral, chaired by a representative from the key line ministries (MOH, MAAIF, MWE, MTWA). National level departments and agencies are also involved here. These include but are not limited to: central warehouses, National Drug Authority (NDA), the academia, development partners, and the One Health Coordination Office (OHCO).

At district level, the District Task Force's Logistics Sub-Committee coordinates all logistics activities including but not limited to regular reporting. Positioned between the NTF and the District Task Forces are the regional prepositioning centers where MCMSs are prepositioned for preparedness, to improve the level of responsiveness in the event of a PHE.

17.6. Classification of commodities for PHEs

For purposes of managing PHEs, supplies are categorized as follows:

a) Supplies for infection prevention and control (IPC). These include supplies for maintaining safe health services operations and mitigating the risks of infectious diseases transmission. Sub-categories under these are Personal Protective Equipment (PPE) and Water Sanitation and Hygiene (WASH) supplies.
b) Supplies for case management; Under this category are supplies used in the care and handling of both suspected and confirmed PHE cases. These may include laboratory supplies for conducting diagnostic investigations as well as therapeutic and supportive care supplies.

17.7. Unique Features of MCMS for use in PHEs

PHE commodities (MCMs) present a number of unique characteristics that affect the design and supply chain management. These include the following:

- Concurrent need: PHE responses often require multiple items from each MCM category at any time. Yet, the same items may also be required for routine health service delivery. This may increase the risk of stockouts, hence requiring strict stock management.
- MCMs may be packed in the form of kits to meet different health needs in emergencies and disasters, and to ease and expedite supply chain management responses.
- Some MCMs may have short life shelf-lives relative to the frequency of outbreak occurrence, while others may have no limitations on shelf life.
- MCMs may have stringent disposal requirements given the hazardous nature of the diseases they are used for.
- They may require separate protocols for distribution, storage, and dispensing including site activation and set up, security, medical protocols, staff readiness, and just-in-time training, screening, and intake procedures.

Supply chain officers ought to consider all the unique features of MCMs to ensure their efficient supply chain management.

17.8. Supply Chain Management Considerations for Managing MCMs for PHE

17.8.1. Selection of Commodities

Determining the types of commodities needed in an outbreak is driven by the nature and type of emergency and constitutes the first step in an effective commodity planning process. The process of product selection involves deciding on the specific items to source for preparedness and response to a particular PHE.

The selection process will consider among other factors:

- The type and or nature of PHE being handled by region/district/facility.
- Costs and funds available
- Packaging and ease of use of the commodity
- Availability of such products within the public health systems (at regional prepositioning centers and National Medical Stores [NMS])
- Quality, safety, and efficacy of the commodity in accordance with National Drug Authority guidelines
- Diseases considered as priorities in Uganda.
- Products in the Uganda Clinical Guidelines disease management
- Products in the Essential Medicines and Health Supplies List of Uganda
- Products in the Standard Test Menu, Techniques, and List of Supplies for Health Laboratories in Uganda

17.8.2. Quantification, Procurement, and Stockpiling

This involves planning, forecasting for future demand, and determining quantities and costs of commodities to be procured, while taking into account the country's supply chain management, service, and resource capacities. Depending on the commodity category and availability of consumption, morbidity, services, and demographic data, quantification methods will vary. The LSC will lead the quantification process centrally in coordination with other pillars, partners, and emergency treatment centers (ETCs). The following will be considered during quantification and stockpiling:

- Average disease incident rates and record of emergencies in the last five years.
- Quantities of commodities available at the stockpile sites
- Commodity consumption rates per disease outbreak
- Lead time and stockpile period
- The anticipated burden an emergency is likely to inflict on the health system and surrounding communities.

Procurement of MCMS for PHE will be conducted by the line ministries' procurement agencies/units, following their standard procurement guidelines with input from NTF.

17.8.3. Ordering, Allocating, and Receiving PHE MCMS

PHE commodity orders must follow a strict procedure to avoid areas of uncertainty anywhere within the PHE supply chain management. The supply chain management is supported by an electronic emergency logistics management system (e-ELMIS) that links to the Logistics Sub-committee, central warehouses, the regional prepositioning centers and District Task Forces.

17.8.3.1. Ordering for PHE commodities

Ordering for PHE commodities through the electronic Emergency Logistics Management Information System (eELMIS) occurs at three levels i.e.,

- The regional level, where the regional prepositioning centers order from the national stockpile site or central warehouses (NMS and JMS)
- The district level, where districts may order from the regional prepositioning centers or directly from the central level warehouses whenever necessary.
- The health unit level, where facilities and other end-user units will order from the districts except for Regional and National level facilities who will order for all their MCMS directly from the central warehouses. These include referral hospitals, regional and central Health laboratories, and specialized health institutes (Blood bank, UCI, UHI etc).

17.8.4. Issuing MCMs

While maintaining procedures detailed in the Essential Medicines and Health Supplies Manual, the following steps shall be taken:

- All items should be issued in the same unit of measure with which they were received until the final user point, where the pack may be dispensed in smaller units.
- Issuance of commodities from the national stockpile site, warehouses, regional prepositioning centers, or any other party should only be done with approval from MOH.
- The District Task Force may adjust allocations to health facilities depending on the prevailing status of the emergency response within the district.
- Ensure proper recording of all items taken out of the store.
- Issuance of commodities at all levels should be through the eELMIS or by using a requisition and issue vouchers (HMIS PHAR 020) approved by the DHO, DVO, Hospital director, health facility In-charges or designates.

17.8.5. Transport and fleet management

Critical activities that require transport services include logistics, medical samples, patients and health personnel deployed during public health emergencies. During preparedness and response to PHEs, the first step in transport management requires that the LSC identify and quantify the national need for transportation. The LSC will coordinate with the warehouses and the regional prepositioning centers to ensure MCMs are delivered to end users.

17.8.6. Stock Management

All stock management procedures detailed in this Manual should be applied to PHE commodities as well. The same tools are applicable. However, PHE commodities will have:

- Separate storage locations within the main storage area
- Separate stock cards from routinely used commodities if both are available at the site
- Within the store, all items should be managed in the same unit of measure with which they were received (do not open/split packages)

17.8.7. Managing Short-Dated MCMs in PHE

Due to potentially low consumption levels in the absence of an emergency, some MCMS are always at high risk of expiry. Stores personnel are advised to monitor commodities' shelf-life as frequently as possible—at least monthly—to identify short-dated items. Once identified, rotate or replace stock as follows:

- All stock with a minimum of three months of shelf-life left should be exchanged with items from the routine/normal supply as soon as possible or prioritized for use to minimize commodity expiry and wastage.
- Any commodity stock positioned for preparedness that has been used, damaged, or issued due to short shelf-life concerns needs to be replenished immediately to maintain a high level of preparedness against possible infectious disease emergencies.

17.8.8. Managing temporary storage locations

Temporary storage locations can be defined as any make-shift storage facilities assembled within or outside of a designated health facility at short notice to meet defined needs for a specified period of time. The following guidelines should be observed:

- Due to limitations in security and capacity, temporary storage locations should not hold stock exceeding 10 days of usage.
- All minimum storage requirements for products to maintain potency should be observed, including but not limited to temperature regulation and use of pallets.
- A record of all commodity transactions at the facility should be maintained.
- Consider storing commodities that are resistant to environmental conditions in the makeshift facility.

17.8.9. Managing waste from MCMs

MCMs-related waste may be either hazardous including infectious waste, anatomical waste, sharps waste, chemical waste, pharmaceutical waste, radioactive waste, pressurized containers, and heavy metals. It may also be nonhazardous such as stationery and wrappings. If poorly managed, waste may be harmful to people including health workers, patients, and the public. Waste from MCMS should be managed appropriately as detailed in the Uganda National Infection Prevention and Control Guidelines of 2013, National Environment Waste Management Regulations, 2020, and the National Drug Authority guidelines for management of pharmaceutical waste. Some of the key principles include:

- Waste minimization
- Segregation
- Treatment and destruction
- Disposal
- Training people on waste management

17.8.10. Monitoring, evaluation, and reporting on commodities for PHEs

Personnel who manage stores must follow these guidelines to assure proper documentation and reporting of MCM-related information:

- Personnel managing stores at different levels must conduct a monthly stock-taking exercise of all MCMs to ascertain the status of the commodities (quantity available, consumption, expiry dates).
- Following the monthly stock status exercise, stores personnel will compile a stock situation report (quantity available, consumption, expiry dates) as well as the transactions within the month.
- These reports will be prepared on a monthly basis during the preparedness phase. During the response phase, the frequency may change to cope with the high demand for supplies and unpredictability of emergency dynamics. The LSC will provide guidance on the desired frequency.
- The e-ELMIS will be used to achieve quick data visibility at all levels.

After an outbreak response, there will be an after-action review of the management of MCMs

17.8.11. Decommissioning and Reverse Logistics

The National Logistics Sub-committee will be responsible for conducting the decommissioning of treatment units and reverse logistics after response to PHEs, to ensure a smooth transition to normalcy. Activities in this process include closure of temporary treatment units and storage facilities, the redistribution of excess MCMs and equipment within host districts, and the return of MCMs and equipment that cannot be absorbed by host districts to the national stockpile/central warehouses. The National Logistics Sub-committee will direct districts, partners and all service delivery points during the implementation of reverse logistics of unused MCMs and assets in their possession.

17.9. Management of Medicines and Health Supplies in Humanitarian settings

The Ministry of Health is responsible for ensuring that safe, effective and quality medicines are available to the population at all times. To exercise this mandate, in Humanitarian settings, the department of Disaster Preparedness and Management under the office of the Prime minister works with MoH to ensure the availability of EMHS.

In situations where redistribution of resources from within the health system is required, the National task force coordinates with the District Disaster Management Committee (DDMC) and the relevant partners to implement redistribution in line with the national redistribution guidelines. The national task force works with the relevant partners to establish mechanisms for replacement of these resources to the health system. In situations where importation or purchase from local suppliers is required, the task force supports all the hazard response partners to conduct this in line with the country's procurement and donations guidelines.

17.10. Resource mobilization

Resource mobilization is multisectoral as follows:

1. MOH quantifies the medicines and health supplies necessary to adequately respond to public health emergencies through the NTF committees.
2. The OPM is responsible for mobilising resources for emergency response.
3. The MoFPED is responsible for mobilizing supplementary budgets during emergencies.

17.11. Vulnerability of the affected infrastructure

It is critical to review how the hazard has affected transportation mechanisms, what secondary effects to the transportation network should be expected as the result of the hazard, and what alternatives are available. In the event of an emergency, the NTF-LC and other NTF committees should work with the DDMC to provide a detailed technical analysis of the affected transportation infrastructure and logistical support during the hazard response and should also work with the DDMC to ensure proper utilization of emergency supplies.

At district level, the NTF-LC works with the DTF to identify parts of the healthcare system that maybe potentially affected by the public health emergency. Logistical support at district level should therefore be coordinated by the NTF-LC and the DTF. The DTF performs its functions through technical subcommittee that are composed of experts in that area of intervention and are therefore responsible for the technical aspects of the control measures.

17.12. The Interagency Emergency Health Kit for Crisis Situations

International agencies including the International Federation of Red Cross and Red Crescent Societies (IFRC), UNFPA, the United Nations High Commissioner for Refugees (UNHCR), and the World Health Organization (WHO) designed and continually review the content of the Interagency Health kits to ensure response to primary health care needs of displaced people. To complement the interagency kit, UNFPA, in close consultation with the members of the Inter-Agency Working Group (IAWG) on Reproductive Health, produces and regularly updates a consolidated set of reproductive health kits for use by humanitarian agencies.

The essential drugs, equipment and supplies needed to provide reproductive health care in crises have been assembled into a set of specially designed pre-packaged kits – The Inter-Agency Reproductive Health Kits. The objectives of the kits are in line with those laid out in the Inter-agency Field Manual on Reproductive Health in Humanitarian Settings. Each of the Reproductive Health Kits responds to a particular reproductive health need and contains supplies calculated for a specific number of people for **a three-month period**.

17.12.1. Why are Inter Agency Reproductive Health Kits Important?

The concept of kits in the supply chain is not new and are commonly used in emergency settings. Depo Provera® is provided with syringes, rapid test kits contain their buffer, lancets/prickers. These are some examples where items are kitted for delivery to service providers.

In the context of the crisis response phase, use of kits enables delivery of essential medicines and supplies required for delivery of the basic health services identified in the MISP for sexual and reproductive health. The kits are preassembled with items identified and quantities defined based on the level of care and enable the deployment in the crisis phase without the need for an assessment. The fact that the kits have a standard set of supplies, and volumes can be anticipated for each level of care, the logistical arrangements can also be made quicker once the estimated target population is established.

17.12.2. Types of Inter-Agency Reproductive Health Kits

There are 11 types of RH Kits divided into three blocks with each block of kits targeting a particular health service delivery level. Some types are further divided into sub-type A and B. For instance, the clean delivery kit (Kit 6), Module A has products to treat the client and Module B has products that the service provider needs to do the treatment or provide the service. In addition, there are complimentary items for the different kits. Note that the complementary kits are not designed as standalone kits.

For the humanitarian response, two additional kits are included in this manual.

17.12.2.1. The dignity kit

The dignity kit includes a basic set of supplies that can be distributed to women and girls to enable management of menstrual health and hygiene needs. They may include other items appropriate to the culture and needs of the target population.

17.12.2.2. UNICEF's Post-Exposure Prophylaxis (PEP) Kit

UNICEF's Post-Exposure Prophylaxis (PEP) Kit that replaces the Kit 3 for management of risk following sexual violence.

Table 26: Summary of the types of Inter-Agency Reproductive Health Kits

Kit #	Kit Content	Community /Health Post (Basic)	Primary Health Care Facility (BEmONC)	Referral Hospital (CEmONC)
Obstetric Care				
Kit 2	Clean Delivery (A & B) Kit 2A: Individual Delivery Kit 2B: Equipment for Birth Attendants	x		
Kit 6	Clinical Delivery Assistance – Midwifery Supplies (A & B) Kit 6A: Midwifery Supplies: Reusable Equipment Kit 6B: Midwifery Supplies: Drugs and Disposable Equipment		x	
Kit 8	Management of Complications of Miscarriage or Abortion		x	

Kit #	Kit Content	Community /Health Post (Basic)	Primary Health Care Facility (BEmONC)	Referral Hospital (CEmONC)
Kit 9	Repair of Cervical and Vaginal Tears		x	
Kit 10	Assisted Delivery with Vacuum Extraction		x	
Kit 11	Obstetric Surgery and Severe Obstetric Complications Kit 11 A - Reusable Equipment Kit 11B - Drugs and Disposable Equipment			x
Kit 12	Blood Transfusion			x
HIV Infection Prevention and STI Prevention and Treatment				
Kit 1	Male Condoms	x		
Kit 3	Post-Rape Treatment*	x		
Kit 5	Treatment of STIs	x		
Managing the Consequences of Sexual Violence				
Kit 3	Post-Rape Treatment*	x		
Kit 9	Repair of Cervical and Vaginal Tears		x	
Preventing Unintended Pregnancy				
Kit 1	Male Condoms	x		
Kit 3	Post-Rape Treatment*	x		
Kit 4	Oral and Injectable Contraceptives	x		

* Replaced with the UNICEF PEP Kit

17.12.3. The Transition from Use of Kits to Integrated Supply

The IARH kits are not intended for regular resupply, as the consumption of the individual elements within the kits is not uniform, resulting in stockout of fast-moving items, and overstock of slow-moving or unutilized commodities in the service delivery points. Once the first tranche of RH kits has been delivered for use in the early phase of the emergency, the plan to transition away from kits should be implemented.

Ideally, we want to try to access logistics data related to the products use during the event and inform the system. Future quantifications should rely on the logistics data to quantify for individual products rather than number of kits as was done in the forecast stage. Resupply should be based on demand or consumption trends rather than kits where the "time-to-deployment" was perhaps a more important factor.

The following are some of the considerations when planning for the transition:

1. Coordinate with the respective stakeholders supporting the humanitarian response to ensure facilitate delivery of health services to the crisis-affected persons that need to be reached with sexual and reproductive health information and services. This includes ensuring that the health facilities that serve these persons to report through the DHIS2 as well as appropriate linkages to NMS and JMS to access commodities.
2. As early as is feasibly possible, the LMIS should track distribution, consumption and stock balances of individual items included in the kits. This will provide early clues on client preferences and health system capacity to absorb certain items.
3. Ensure that service level data (e.g., number of cases diagnosed and treated, etc.) are captured and reported into manual and electronic HMIS tool.
4. Establish which items may already be available in the national supply chain system and could therefore be routinely ordered and supplied by either NMS or JMS. Support the health facilities to quantify and order the required items from respective warehouses.
5. Where an item is considered essential, but consumption remains low, explore how to bridge any skill gaps on the part of the health workers to encourage uptake.
6. Anticipate impact of planned or ongoing demand generation activities withing the target settlements and host districts that will significantly change consumption of certain products.
7. Anticipate additional data that should be collected that will improve the accuracy of the quantifications going forward. Coordinate with host district authorities, central level agencies and implementing partners to systematically collect the data to support the quantification of needs for the post-crisis phase.

KEY POINTS

- The OPM oversees all emergency response activities in the country.
- OPM and MoFPED provide financial support for emergency responses.
- MOH is responsible for public health emergencies.
- MAIIF can support MOH for zoonotic disease-related emergencies.
- The NTF-LC is a sub-committee of the NTF that oversees all logistics aspects of emergency response under the MOH.
- The NTF-LC takes the lead in quantifying and securing medicines and health supplies for emergency situations.
- The DTF coordinates emergency response activities at district level.
- The National Medical Countermeasures Plan for Public Health Emergencies provides comprehensive guidance on management of MCMs.
- The health worker can also play an active role in emergency response but has to be adequately trained and prepared.
- The United Nations and partner agencies have developed pre-packed Emergency Health Kits to ensure timely humanitarian response to primary health care needs of displaced people and refugees.

18. CHAPTER | 18 | SHORT-DATED, DAMAGED, OBSOLETE, EXPIRED STOCK AND PHARMACEUTICAL WASTE

18.1. Introduction

Medicines and Health supplies do have limited shelf lives. Standard treatment guidelines, laboratory testing protocols and morbidity patterns often change, therefore it can be expected that some medicines may not be used before expiry. Health workers can limit stock expiry by closely monitoring expiry dates and taking the appropriate action to redistribute stock when necessary. This part describes how to handle short dated, damaged, obsolete, and expired medicines and health supplies.

18.2. What to do with Short-Dated Items

As a general rule, any item expiring in three months' time is short dated. However, some slow-moving items can also be included in that category, for example Praziquantel tablets, or items which are only available in large units. At times, it is obvious even before three months prior to the expiry date that the item will not be used up in time. With the kit supply system, you may receive too many of some items, so be extra careful to go through your supplies often to identify those that need to be redistributed (more than four times the AMC). If, in each kit, you receive more than what you use in two months, you will build up excess supplies that need to be redistributed. The Medicines Management Supervisors (MMS) can help you identify which items those are.

When doing the monthly physical count, you will notice items that are short dated. It is extremely important to take immediate action to avoid any item's expiration on the shelf. Allowing three months for redistribution is a short time, and the process must begin immediately.

18.2.1. At the health facility

Steps to take at the health facility include—

- Making a note of any item expiring within three months (or longer, for slow-moving items)
- Calculating how many units will be issued and used by your facility before the item expires. From that figure you can see how much you need to redistribute

Example with kit

You have 75 units of an item with a 12-month shelf life. Your AMC for the item is 7.

Before the next kit supply, which is bimonthly, you will use 2 (months) × 7 (AMC) = 14.

Your stock balance therefore is: 75 – 14 = 61 units. If you receive more than 14 units in a kit, you will slowly build up excess supplies.

You might want to have 4 months of supplies in stock: 4 × 7 =28, so you should still redistribute 61 – 28= 33 units, although they have 12 months left of shelf life, you would have to redistribute them regularly to avoid expiry.

18.2.1.1. Steps to take include the following

1. Alert the Health sub-district (HSD) or the district about any stock that cannot be used before expiry or that you have too much of.
2. Hand over the items to the district or HSD supervisors for redistribution. Be sure to fill in a requisition and issue voucher to go with the stock and keep a copy for the facility. A member of the health unit management committee should be present during the handover.
3. On the stock card, fill in under the losses and adjustments column the quantity sent to the district store and note the reason.

18.2.2. At the DHO

The DHOs should coordinate the redistribution:

1. Make an extra effort to redistribute excess stock following notification/alerts from the health facilities in the district.
2. The DHO should check internally with other health facilities in the district or externally with other districts that might make use of the short-dated or excess stock. The DHO should coordinate the redistribution process as per guidance provided in Chapter 15.
3. The redistribution process within the district should have no monetary implications for the recipient health facility.

18.3. What to do with Expired or Damaged Stock

Occasionally medicines and health supplies will expire before use, sometimes because of poor stock management, reduction in consumption rates due to changes in treatment guidelines or protocols or because of unsolicited donations. Expired items should not be part of your stock; they should be removed and put in the designated place. It should also be recorded in the stock card as a negative adjustment so that the correct balance on hand is calculated after you have removed the expired items from the shelves:

1. Expired medicines may no longer be effective and may be dangerous.
2. Damaged or expired stock should be placed in a designated salvage area.
3. A written record of all stock consigned to this area should be maintained.
4. Expired or damaged stock must be destroyed in accordance with local regulations.

18.3.1.1. Steps for the health facility to take

Handle expired and damaged items carefully.

1. Separate damaged or expired health commodities from usable commodities, remove them from inventory immediately, and dispose of them according to established procedures.
2. DO NOT use expired medicines!
3. Designate a separate part of the storeroom for damaged and expired goods. This area should clearly be labelled as the storage area for expired items, and where possible, should be physically separated from other commodities.
4. Record all expired items in the register along with the price from the most recent invoice.
5. Inform the district authorities or MMSs about the expired items, especially when they come for a supervisory visit. The district will arrange to collect the expired item; fill out and sign a requisition and issue voucher (keep a copy for the facility).
6. At the end of a reporting period (quarterly), calculate the total value of expired stock that has expired and include this in the facility's regular reports.

18.4. Expired or spoiled medicines register

Use this register to track all expired or spoiled medicines and supplies from a health facility. The transactions recorded in the book should be done as exemplified in the table below.

Table 27: Expired or spoiled medicines register

Date	Expired /Spoiled item with description	Exp Date/ Batch No.	Quantity X Unit	Unit Price (UGX)	Total value of expired items	Witnessed / taken by	Remarks
02/12/22	Paracetamol 500mg tab	FT300	5 x 1000	5,906	29,530	Ruyooka/ MKali	Taken to DHO
04/02/23	Cotrimoxazole 480mg tab	12K09	3 x 1000	23,015	69,046	Ruyooka/ MKali	Taken to DHO
31/03/23	Chloramphenicol 500mg Inj	AE360	100 x 1	4,900	490,000	Ruyooka/ MKali	Taken to DHO

Alternatively, a quarterly Expired drug report can be generated using a computerized logistics management system.

18.4.1. Steps for the DHO to take

1. Make an expired stock register similar to the same format as above but include an extra column to write the facility from which it was received.
2. Record all expired stock in the register.
3. At the end of each month, calculate the total value of expired stock for the district.
4. Arrange to hold a Board of Survey once a year in accordance with regulations for disposal of public assets. The board of survey will prepare a report in triplicate.
5. Inform the National Drug Authority if expired stock is to be destroyed locally within the district; NDA is mandated to advise on the suitability of the destruction and supervise the process.
6. The MOH will periodically collect expired medicines for safe disposal or destruction using NMS vehicles or other transporters.

18.5. What to do with Obsolete Items

Standard treatment guidelines, laboratory testing protocols and morbidity patterns often change, therefore it can be expected that some medicines may not be used rendering some EMHS obsolete. Obsolete items should be handled in the same way as expired items as per section 11.2.

KEY POINTS

- Short-dated items are medicines and supplies expiring within the next three months and slow moving items available in large quantities.
- Checking expiry dates must be part of every physical count.
- Effort must be made to use short-dated or excess stock before it expires, including redistributing it to other health facilities.
- The requisition and issue voucher should be filled in and stock card updated to reflect the redistribution.
- Expired medicines should be removed from the shelves in the store and kept in a separate designated area.
- The removal should be shown on the stock card as an adjustment.
- The expired items register should be filled with the details of the expired items including the cost.
- The DHO will advise on when the expired items will be collected for destruction.
- Before destruction, a Board of Survey will be constituted to write off the items.
- The National Drug Authority must approve the destruction method and oversee the process.

Figure 52: Sample of board of survey report

BOARD OF SURVEY REPORT

Department of: *Health office of the District Health Officer*

Proceedings of a Board of survey held at: *District health Store* on *15th March 2023*

The following uncerviceable items were examined

Description of article	Number or quantity	Value		Reason for condemning	Recommendation on how to dispose
Assorted expired medicines and laboratory reagents	*See full list of iteams and quantities attached*	*UGX. 100,000,000*	*USD*	*Expired items*	*To be destroyed in accordance to NDA guidelines*

We the undersigned do hereby certify that we have examined the above mentioned items, and find them unserviceable, except otherwise indicated in the final column. We recommend that the former be disposed of as in that column

Name: Rank:

Date: Members of Board of survey

APPROVED: I hereby certify that the items above have been disposed off as authorized:

Date: ..... Date: .....

Note: The recommendations of the board should not be carried out untill approval thereof has been conveyed

Instructions for use

Instructions for Board of survey Boards of survey will:	Instructions for officer in-charge of movable assets
1. Find equipment submitted serviceable or not serviceable as the case may be 2. Recommend as to the items condemned whether they should be a) sold b) sent to a center for parts to be utilized c) order that they should be destroyed (burned or brocken up) 3. The proceedings of the board should be in triplicate. One copy of the approved be sent for retention by the officer-in-charge of and responsible for the equipment. One will be attached to the voucher for replacement or to the revenue return in case of sales, and the original be retained at the district office.	1. A certificate of destruction should be given by NDA showing how the items will be destroyed. 2. In case of sale, the cash should be properly brought to account, supported by the proceedings of the board 3. In case of transfer, a report when dispatched and where to should be availed It is suggested that lists of losses should be submitted to each Board of survey with such explanation as may be possible. and that successive lists be forwarded as part of the proceedings of the board with such comments.

18.6. What to do with Pharmaceutical Waste

Medical waste management is fundamental for the provision of quality, people-centered care, protecting patient and staff safety and safeguarding the environment. As part of broader water, sanitation and hygiene (WASH) and infection prevention and control (IPC) efforts, safe management of medical waste reduces health-care-related infections, increases trust and uptake of services, increases efficiency and decreases cost of service delivery. This includes safe medical waste management involving identification, segregation, collection/storage, transportation, treatment and waste disposal.

This section highlights the key aspects of safe medical waste management in order to guide health workers and facility managers to improve such services in health-care facilities.

18.6.1. Types of pharmaceutical waste

18.6.1.1. Non- sharp non-infectious waste, or general waste

Is non-hazardous. Examples of general waste include:

- Boxes, wrapping paper
- Paper/paper towels
- Plastic or paper bags
- Surgical wrappings

18.6.1.2. Non-sharps infectious waste

Examples of infectious waste include:

- Items soiled with blood
- Human tissue/organs
- Used alcohol swabs/bandages
- Waste from isolation ward
- Contaminated disposable PPE items
- Excreta (can be placed directly in the latrine)
- Liquid infectious waste include: Vomit, faeces, blood, sputum, saliva, pus, contaminated wash-water

18.6.1.3. Pharmaceutical Waste

Pharmaceutical waste includes:

Expired drugs (tablets, capsules, granules, powders, antibiotics in vials), Semi-solids (Creams, lotions, gels, suppositories), Liquids: (Solutions, suspensions, syrups, ampoules), Aerosol canisters (Propellant driven, sprays, inhalers, antihistamines sprays) and damaged pressurized cylinders.

Sharp waste These include all materials that can compromise the integrity of the skin through pricks (needle sticks) or cuts. These include but not limited to:

Needles, blades and scalpels, broken ampoules or vials, trocars, lancets, broken slides etc.

18.6.2. Waste collection

Waste should be segregated at the point of generation to enable appropriate and safe handling. All solid, non-sharps, infectious waste should be collected using leak-proof waste bags in covered bins.

Table 28: WHO recommended segregation and collection scheme

Waste categories	Color of container and markings	Type of container	Collection frequency
Infectious waste	Yellow with biohazard symbol (highly infectious waste should be additionally marked HIGHLY INFECTIOUS	Leak-proof strong plastic bag placed in a container (bags for highly infectious waste should be capable of being autoclaved)	When three-quarters filled or at least once a day
Sharp waste	Yellow, marked SHARPS with a biohazard symbol	Puncture-proof container	When filled to the line or three-quarters filled
Pharmaceutical waste	Brown, labeled with appropriate hazard symbols	Plastic bag or rigid container	On demand

Waste categories	Color of container and markings	Type of container	Collection frequency
General health-care waste	Black	Plastic bag inside a container or container which is disinfected after use	When three-quarters filled or at least once a day

18.6.3. Waste Transportation

Ideally, waste should not be stored for more than 24 hours before being destroyed. Therefore, on-site transportation should take place whenever possible during less busy times (i.e. in the evenings or very early morning) within the 24-hour period. Set routes should be used to prevent exposure to staff and patients and to minimize the passage of loaded carts through patient care and other clean areas. Depending on the design of the health-care facility, the internal transportation of waste should use separate floors, stairways or elevators from patients as far as possible.

Staff handling waste should wear adequate personal protective equipment (PPE) including gloves, closed shoes, overalls and masks. Education and training must be provided to all waste transport workers and include how to safely handle waste containers that leak or are broken.

Waste, especially hazardous waste, should never be transported by hand due to the risk of accident or injury from infectious material or incorrectly disposed sharps that may protrude from a container.

The vehicles should be thoroughly cleaned and disinfected daily as per a written protocol.

18.6.4. PPE for waste management

Before conducting waste management, it is critical that you first perform a risk assessment to ensure you are wearing the appropriate PPE. When handling infectious waste, wear a full set of PPE.

18.6.5. Waste disposal

All health care waste produced during care should be collected safely in designated containers and bags, treated, and then safely disposed of or treated, or both, preferably onsite.

If waste is moved off-site, it is critical to understand where and how it will be treated and destroyed.

18.6.5.1. Waste disposal methods

There are three waste disposal methods:

- Ultra-high Temperature incineration
- Inertisation & land fill
- Dilution then flushing into protected soak pit or lagoon.

The type of method used depends on the type of waste.

19. CHAPTER |19 | REDISTRIBUTION AND REVERSE LOGISTICS

19.1. Introduction

Reverse logistics is the flow of products from any stage of the supply chain back to preceding stages; that is from the demand side to the supply side.

Redistribution is an essential part of reverse logistics that involves movement of usable Essential Medicines and Health Supplies (EMHS) from one health facility to another triggered by one or more of the following circumstances.

1. Absolute need of the item that is stocked out or threatening to stock out (below minimum stock i.e., **<2 months of stock**)
2. Epidemic or rapid enrolment of clients into a particular treatment than earlier planned
3. Routine re-supply not expected before the current stock runs out or communicated delays in delivery by the supplier.
4. Facility which missed out supply during delivery
5. Threatening to expire (**less than six months**) if not redistributed
6. Overstocked items (Stock on hand – Maximum stock)
    a. Maximum stock = AMC x 4
    b. Minimum stock = AMC x 2
7. New health facilities which are not supplied by the warehouses routinely.

Whatever you cannot use before the expiry date should be redistributed at least six months before their expiry date. If drugs expire in spite of your best efforts, clearly separate them from the viable stock, mark them as "expired", appropriately document and return them to your District medical store. For more information see CHAPTER | 18 | SHORT-DATED, DAMAGED, OBSOLETE, EXPIRED STOCK AND PHARMACEUTICAL WASTE.

CAUTION!

Note that the facility receiving EMHS during redistribution **MUST** confirm that it can use the commodities before they expire.

With reference to the Ministry of Health redistributions guidelines (2018), redistributions of health commodities could either be within the district or across regions/Districts. Depending on the item and as guided by the MoH redistributions guidelines, redistribution can also occur between public and PNFP facilities (for specific EMHS). Redistribution increases efficient utilization of the scarce resources by moving usable stock to where it is most needed thereby preventing loss through expiries of these costly and lifesaving items.

19.2. The Redistribution Process

With reference to the MoH redistributions guidelines (MoH, 2018), the redistribution process is a three-step process:

19.2.1. Step I: Detection and Reporting of Stock for Redistribution

1. The store's personnel/supervisor should complete monthly physical inventory checks and notify the health facility in-charge of items that need to be redistributed or those that need to be sourced from other facilities due to their low stock levels.

2. Using a redistribution of EMHS notifications Form (See table 10 - HMIS logistics tools), the health facility in-charge should then communicate the need to the DHO.

19.2.2. Step II: Identification of Recipient Health Facility/Source Health Facility

1. The DHO should first consult other health facilities about the available stock (excess & short dated), including the District Hospital and the Regional Referral Hospital for that district.
2. At the same time, the DHO can also notify the facilities including PNFPs about the need (for those requiring the commodities)
3. If health facilities in a district are well-stocked and do not need the available item, the DHO may communicate with the neighboring districts in the same region and offer them items. If no other district in the region is willing to take the available stock, the DHO should inform the warehouses about these stocks.
4. Warehouses inform other regions within the country about availability of redistributable stock (if the quantities and values are worth the effort).
5. If there is no need in country, the warehouses can notify MoH which will inform the East African partners.

19.2.3. Step III: Authorization and Stock Adjustments

Once a recipient is identified in the district or region, the transfer process of redistributable stock should be initiated using two documents; that is the requisition and issue voucher and the EMHS redistribution form (filled in quadruplicate). The activities to be done in order to execute the transfer are as follows:

1. The In-charge of the donor facility fills the requisition and issue voucher and EMHS redistribution form on behalf of the recipient health facility.
2. The in charge of the donor facility, the Health Unit Management Committee (HUMC), and DHO, sign both the requisition and issue voucher and EMHS redistribution form.
3. On reception of stock, the person receiving the EMHS signs both requisition and issue voucher and EMHS redistribution form on behalf of the recipient facility.
4. On delivery at the recipient facility, the health facility In-charge and its Health Unit Management Committee member (HUMC), sign the requisition and issue voucher and EMHS redistribution form.
    a. One copy (1st) of the EMHS redistribution form should remain at the donor health facility. The storekeeper should immediately make the negative adjustments on the stock card.
    b. One copy (2nd) of the EMHS redistribution form should be kept by the recipient facility. The storekeeper should immediately make the positive adjustments on the stock card.
    c. One copy (3rd) of the EMHS redistribution form should be forwarded to the DHO of the donor facility. Notify the In-charge HSD of the transaction.
    d. One copy (4th) of the EMHS redistribution form should be forwarded to the DHO of the recipient facility in case of inter district redistribution.
5. The store's personnel for both the issuing and the receiving facilities should make the adjustments to the stock card and at the end of the month, the stock book.
    a. Issuer makes a negative adjustment - stating the destination of the item in the to/from column.
    b. Receiver makes a positive adjustment – stating the source of the item in the to/from column.

NOTE

In case of inter district redistribution, both DHOs on receipt of the filled redistribution form, notifies their respective district Chief Administrative Officer (CAO) about the transaction.

19.2.4. Tools necessary for redistribution exercise

a. EMHS Redistribution form (HMIS PHARMA 016)
b. Requisition and Issue Voucher (HMIS PHARMA 020)
c. Stock Card (HMIS PHARMA 001)
d. Stock Book (HMIS PHARMA 002)
e. EMHS Notification Form (HMIS PHARMA 014)
f. Borrow/lend record

19.2.5. Key stakeholders in the redistribution exercise

a. Health Facility In-charge
b. Health Facility stores personnel
c. Health Unit Management Committee
d. DOH
e. CAO (Inter District redistributions)
f. Implementing partners (IPs)
g. Transport facilitator
h. HSD In-charge

19.3. Requisitioning of EMHS from other facilities

If a stocked-out item is urgently required, try to requisition from another facility. Only requisition the amount needed for that emergency. To requisition EMHS from another facility, fill in the requisition and issue voucher (HMIS PHARMA 020) and fill in the borrow/lend record. Do not enter this estimate in the commitment register because it is not a new order. Enter the transaction in the stock card and record the quantities borrowed in the losses and adjustment column. If you issue items to another facility, follow the same procedure.

All facilities should keep a **borrow/lend record** to help keep track of what is borrowed and lent and to ensure that the facility gets items back and returns items that were borrowed. A borrow/lend record has two parts—one records what the facility has borrowed and the other what the facility has lent to others. The borrow/lend record should be clearly marked with "borrowed" or "lend" so as not to make mistakes. There is not a pre-printed record available so you will have to make your own record using a notebook or similar.

Figure 53: Borrow/Lend Record

BORROW/LEND RECORD							
Date	**Item Code**	**Item**	**Unit**	**Quantity**		**To/From**	**Returned date**
				Borrowed	**Lent**		
23/6/22	220 185	Cotrimoxazole 400-80 mg tablets	1000 tabs	5		Kayunga Hospital	8/8/22
1/10/22	220 460	Paracetamol 500mg tablets	1000 tabs		3	Wabwoko HC III	2/12/22
7/11/22	24/1930	Crepe bandage 2 "	piece	10		Kojja HC IV	
1/12/22	220 155	Chlorpromazine HCL 100 mg	100 pack	10		Baale HC IV	

20. CHAPTER | 20 | HANDLING OF EMHS DONATIONS IN UGANDA

20.1. Introduction

World over, countries require donations from each other, United Nation agencies and Non-Governmental Organizations (NGOs) in order to support their efforts to respond to emergencies and circumstances that may require more resources than can be mobilized locally. Uganda has had a fair share of natural disasters and insurgencies within and in the surrounding countries usually resulting into internally displaced persons or influx of refugees respectively. These require resources that usually overwhelm the country's ability to respond to such emergencies. In such circumstances, donations of medicines and health supplies come in handy to support the country's efforts to offer health services to the affected populations. Whereas donations are necessary, there is need for guidelines to manage the processes of donations of medicines and health supplies into the country. The purpose of the guidelines is to ensure timely access to quality medicine donations in international development assistance and emergency aid situations.

20.2. Core Principles of donations

Guidelines for medicine donations are based on four (4) core principles:

- Donations of medicines should benefit the recipient to the maximum extent possible. All donations should be based on an expressed need and are subject to review and approval by MOH.
- Donations should be given with due respect for the wishes and authority of the recipient and in conformity with the government policies and administrative arrangements of the recipient country.
- There should be effective coordination and collaboration between the donor and the recipient with all donations made according to a plan formulated by both parties.
- The donations should be of good quality. If the quality of an item is unacceptable in the donor country, it is also unacceptable as a donation.

20.2.1. Approval of donations

- National level donations shall be approved by MOH.
- The office of the DHO must approve all donations that are directed to facilities in their jurisdiction.

The office of the executive director, and hospital director must approve all donations for national referral hospitals/ institutes, and regional referral hospitals.

20.2.2. Benefits of Donations

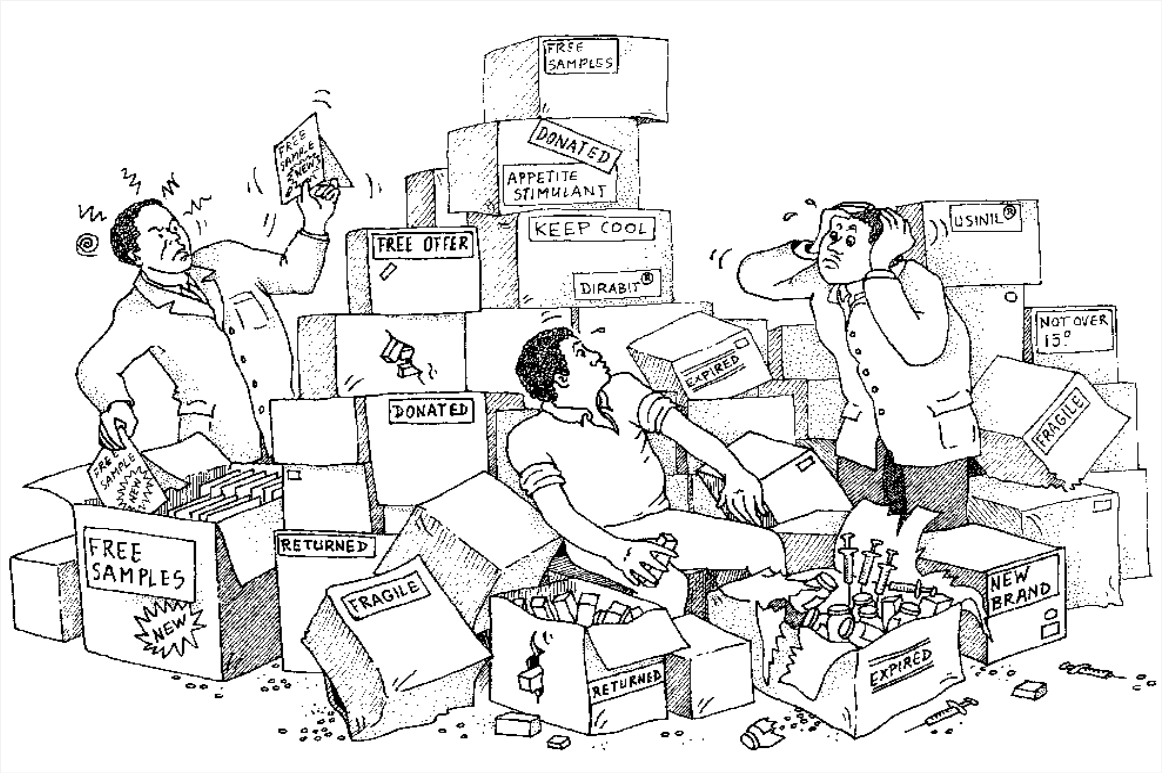
1. Save lives and ease suffering when well-coordinated and managed.
2. Support rebuilding of health systems by ensuring access to health supplies to the population.
3. Provide savings in development support budgets thereby enabling these resources to be used for other purposes.

20.2.3. Potential shortcomings of donations

1. Donated medicines and health supplies may not be relevant to the emergency situation, to the disease pattern or to the level of care that was targeted.
2. Donated medicines and health supplies have arrived unsorted and labelled in a language not locally understood.
3. Sometimes medicines and health supplies have been donated without the required documentation.
4. Sometimes medicines and health supplies returned to pharmacies by patients, or free samples derived from health professionals, have been collected and donated.

5. Medicines and health supplies have been donated in the wrong quantities, leading to situations where the large stocks could not possibly be used within their remaining shelf-life.
6. Donor agencies and their local partners have sometimes ignored local administrative procedures for receiving and distributing medicines and health supplies.

Figure 54: Donations can be a Problem



Source: MSH and WHO. 1997. Managing Drug Supply.2nd ed. Hartford, CT, USA; Kumarian Press.

20.2.4. Conditions for Importation of EMHS Donations

1. The items identified for donation shall be directly related to the disease pattern of Uganda.
2. EMHS should not be sent without prior consent of the Government of Uganda. The Director General of Health Services and/or Permanent Secretary, Ministry of Health shall be informed of all EMHS donations that are being considered to be imported for donation and use in Uganda.
3. All donated EMHS or their generic equivalents shall appear on the National List of Essential Medicines and Health Supplies List of Uganda/World Health Organization Model List or otherwise shall be approved for use in Uganda by National Drug Authority.
4. The National Drug Authority shall be accordingly informed to procedurally grant market authorization (approval for importation).
5. Presentation, strength, and formulation of donated medicines and health supplies shall as much as possible be similar to those commonly used in Uganda.

20.2.5. Approval procedures for donated EMHS

1. NDA grants permission for importation of EMHS donations from WHO, SRA (EU, SA) or any other NDA certified sources irrespective of their current registration status in Uganda.
2. Where it is requested, the importing entity shall share the list of certified manufacturers that meet these requirements with the NDA.
3. In view of NDA's guidance that registered products require endorsement of proforma invoices by Local Technical Representatives (LTRs), exemption should be extended to

donations for humanitarian or relief aid to reduce delay times as these are not meant for commercial purposes.

4. For all donations, the NDA fees regulations on importation of donated EMHS shall apply accordingly (NDA fees regulations 2014).

For all imported donations, donations to the government of Uganda earmarked for use in the public health sector, the importing agencies will be supported by MoH, Department of Pharmaceuticals and Natural medicines to apply for import clearance through NDA to apply for import clearance. This will reduce delays in clearing these donations.

All donations should have appropriate documentation to facilitate receipt and recording by the recipient entity. Imported donations should have:

a. Proforma Invoice
b. Certificate of analysis
c. Certificate of Origin
d. Letter of Donation
e. Certificate of conformity (for medical devices)
f. GMP certificate
g. Legal status of the entity receiving the donation
h. Any other documents as may be required by NDA

20.2.6. Quality Assurance and Shelf-life

1. EMHS for donation Must be obtained from a reliable source approved by the National Drug Authority, World Health Organization or Stringent Regulatory Agencies.
2. The donated EMHS shall be delivered in the original primary and secondary containers or packages and appropriately labelled in English as guided by the MOH donations guidelines 2018.
3. Donations for EMHS should have at least one year from the date of entry into the country.

20.3. Use and Accountability

- Donated items to government of Uganda shall be received by National Medical Stores (Public Facilities), JMS (PNFP facilities) or other approved warehouses and distributed to health facilities following the normal procedures put in place by Ministry of Health.
- Documentation and accountability for the items received at health facilities/service delivery points shall be made according to the normal HMIS requirements and accountability procedures.
- Management and disposal of the expired/obsolete donated items shall be done according to the section on 'What to do with Expired or Damaged Stock' and section 'What to do with Obsolete Items'.
- Private Organizations shall follow the established procedures made by National Drug Authority

21. CHAPTER | 21 | LOGISTICS MANAGEMENT INFORMATION SYSTEM

21.1. Introduction

Information is the engine that drives the health supply chain logistics cycle. Without complete and accurate commodity and health supply information, the health supply chain system would not run smoothly and would be prone to persistent stockouts. A logistics management information system (LMIS) is a system of records and reports (paper-based or electronic) used to document logistics processes, aggregate, analyze, validate, and display data (at all levels of the health supply chain system) that can be used to make informed logistics decisions and manage the supply chain.

Objectives of LMIS are:

1. To provide a repository of tools, product and project assessments, and other information to promote a collaborative approach for LMIS solutions
2. Encourage the reuse of proven components and methods
3. Encourage the use of international standards in supply chain and health informatics
4. Encourage seamless interoperability and flow of information between supply chain layers
5. Create LMIS applications that are integrated with other health information system domains
6. Improve critical decision-making in order to address the dynamic health service requirements.

An effective logistics management information system (LMIS) should ensure that adequate quantity and quality of health commodities are always available at the point of service to meet patient demand [2]. An LMIS collects data about commodities, this information is often used for activities, such as filling routine supply orders for health facilities (WHO 2011).

21.2. LMIS in Supply Chain Management

LMIS data is captured at all levels of the health supply chain management from planning and forecasting, procurement from suppliers, shipment, central warehouse management, ordering, distribution/re-distribution, receipt, facility storage, stock management, requisitions and Issues, dispensing, reporting on logistics processes, other consumption data and disposal. LMIS tools therefore facilitate the capture of the supply chain data. The Ministry of Health prescribes and defines tools to be used in the health sector[8] including LMIS tools for managing medicines and health supplies. They are listed in Table 10 according to the different supply chain processes that require them and their use is further described in the subsequent sections herein.

Absence or wrong use of Logistics Management Information Systems causes:

1. Poor record keeping: incomplete or not updated stock and consumption records.
2. Poor reporting: late, incomplete and poor quality reports.
3. Data not moving up or down the different level of service delivery: facilities not submitting to districts, districts not sending reports to central, central not providing feedback to districts and facilities.
4. EMHS data not used for decision making and procurement planning.

[8] Uganda Ministry of Health, 2018: Uganda's Health Management Information System

Figure 55: The Logistics Cycle

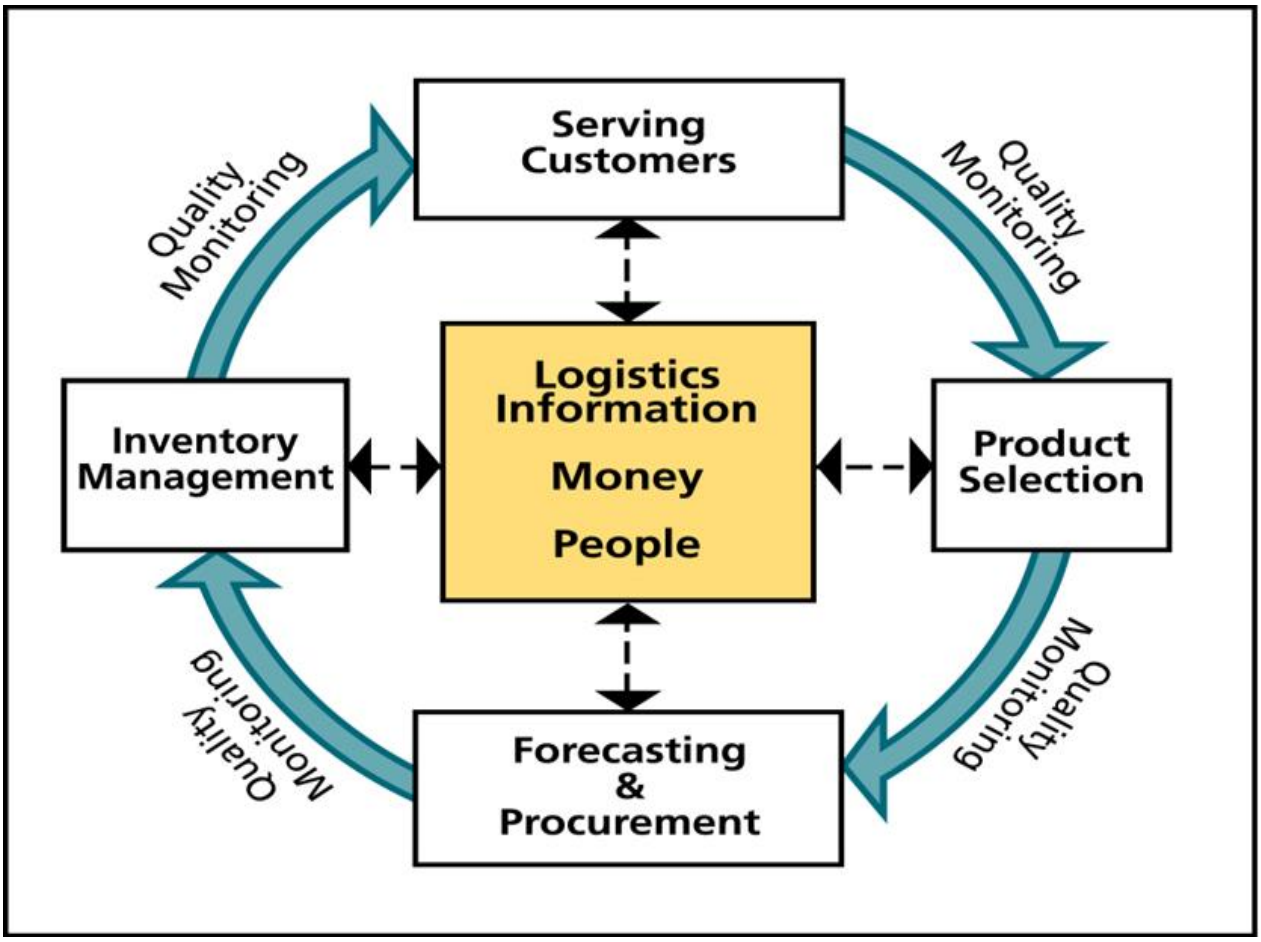


Table 29: LMIS Tools categorized by SCM process

Supply Chain Process	LMIS Tool	Objective
Facility and District Level		
Procurement and Ordering	HMIS PHAR 009: HEALTH FACILITY PROCUREMENT PLAN FOR EMHS	To determine the cost and quantities of medicines and health supplies required for a planning period of one year
	HMIS PHAR 008: BI-MONTHLY REPORT AND ORDER CALCULATION FORM	i. To report stock – on - hand balances of items at the health facility ii. To report the facility's bimonthly usage of Commodities iii. To determine quantities of commodities to re-supply the facility
	HMIS PHAR 021: THE BI-MONTHLY REPORT AND ORDER CALCULATION FORM FOR HIV TESTS	Reports the total number of HIV tests used and received at the health unit, Ordering for HIV AIDS Test kits.
	HMIS PHAR 017: ARV MEDICINES ORDER AND PATIENT REPORT FORM	i. To report the quantity of medicines received and dispensed in the two months reporting Period

Supply Chain Process	LMIS Tool	Objective
		ii. To report the number of existing patients at the start of the cycle and new patients enrolled during the cycle iii. To request/order drugs to the maximum level of 4 months for the next cycle
	HMIS PHAR 022: ORDER FORM FOR EMHS	To request supplies from the National Medical Stores
	HMIS PHAR 023: LABORATORY ORDER FORM	i. To Report the total number of reagents & consumables used and received at the health unit. ii. Ordering for Laboratory Reagents & Consumables (consolidated).
	HMIS PHARM 013: QUARTERLY RETURN FORM FOR CLASS A MEDICINES /ORDER FORM BOOK	i. To report the utilization of Class A Medicines ii. To order for Class A Medicines
Receipt of Commodities	HMIS PHAR 015: DISCREPANCY REPORT	To outline the steps to be followed by the facility stores personnel when there is a discrepancy in medicines and supplies received
Storage and Stock management	HMIS PHAR 001: STOCK CARD	To track the movements and balance of all commodities stored at any place in the health unit for more than a week
	HMIS PHAR 002 STOCK BOOK: STOCK BOOK	To summarize the contents of individual stock cards into one book, making the ordering process simpler
	HMIS EPI 016: VACCINE AND INJECTION MATERIALS CONTROL BOOK (VIMCB)	To improve vaccine and other EPI supplies stock management
Requisition and Issue	HMIS PHAR 020: REQUISITION AND ISSUE VOUCHER	To make internal orders within the health unit for and issuing of commodities to be used **for** redistribution purposes between Health Facilities within and outside the district
	HMIS PHAR 005: PHARMACY CLASS A MEDICINES REQUISITION AND ISSUE VOUCHER	To make internal orders within the health unit and issuing of commodities of class A (narcotics)
Dispensing and compounding	HMIS PHAR 003: DAILY DISPENSING LOG	For recording of medicines received from stores and dispensed to patients, to monitor consumptions and use and ensure accountability
	HMIS PHAR 024: ARV AND OI MEDICINES DISPENSING LOG	To record ARVs and OI drugs dispensed and monitor rational use of medicines dispensed to each individual patient

Supply Chain Process	LMIS Tool	Objective
	HMIS PHAR 006: WARD SERVICE DELIVERY POINT CLASS A MEDICINES REGISTER	For recording of medicines dispensed and monitoring consumption by recording class A (narcotics) medicines dispensed to each individual patient.
	HMIS PHAR 018: DRUG RECONSTITUTION FORM	To document drugs reconstituted for patients
Consumption reporting	HMIS PHAR 004: DAILY SUMMARY FORM OF RECONSTITUTED CHEMOTHERAPY DRUGS	To summarize the total number of units dispensed per IV chemotherapy on a daily basis
	HMIS PHAR 013: QUARTERLY RETURN FORM FOR CLASS A MEDICINES ORDER FORM BOOK	Used to report the utilization of Class A Medicines
	HMIS PHAR 014: NOTIFICATIONS FORM OF EMHS FOR REDISTRIBUTION	To inform the DHO about the excess or short dated viable EMHS that need redistribution among health facilities, districts and regions where it is most needed
Redistribution	HMIS PHAR 016: REDISTRIBUTION FORM FOR EMHS	To redistribute excess or short dated viable EMHS between health facilities, districts and regions where it is most needed
	HMIS PHAR 019: TECHNICAL SUPPORT SUPERVISION TOOL FOR HIV COMMODITIES	To document stock status at the facility during support supervision visits.
Monitoring & Supervision	HMIS PHAR 007: VACCINE UTILISATION MONITORING FORM HEALTH FACILITY LEVEL (SERVICE DELIVERY)	To Improve practices in vaccine management
	HMIS PHAR 011: Adverse Drug Reactions and Adverse Events Following Immunisation Reporting Form	To reporting form for all suspected adverse drug reactions (ADR) and adverse events following immunisation (AEFI)
	HMIS PHAR 012: NATIONAL DRUG AUTHORITY (NDA) MARKET COMPLAINT REPORT FORM	To outline the guiding steps to be taken when filling a market complaint report form
	HMIS PHAR 010: EXPIRED SPOILED MEDICINES REGISTER	Used to track all expired or spoiled medicines and supplies from a health facility
Disposal	HMIS PHAR 025: ART MEDICINE RETURN FORM	To document data on expired, damaged drugs and commodities that have not been dispensed during HIV community activities under the differentiated Service Delivery model.

Supply Chain Process	LMIS Tool	Objective
	HMIS PHAR 025: ART MEDICINE RETURN FORM	To document data on expired, damaged drugs and commodities that have not been dispensed during HIV community activities under the differentiated Service Delivery model.
Community Level		
Reporting & Requisition	HMIS VHT 002: COMMUNITY PRODUCT ISSUE LOG	To track the quantities of the different items that are issued at the health facility to individual community health workers/VHT
Reporting & Requisition	HMIS VHT 004: SUMMARY FORM FOR CONSUMPTION AND REQUISITION	To summarize consumption data, stock on hand and quantities to resupply community health workers within a given reporting period.
Issue	HMIS VHT 005: MAGIC CALCULATOR	To quantify the particular drugs needed to be supplied by health facility to the VHT
	HMIS VHT 003: COMMUNITY DAILY CONSUMPTION LOG	To track the movements and balance of all commodities stored by the community health worker.
Dispensing/ Consumption reporting	HMIS VHT 006: VHT ICCM REGISTER	Record information and help health facility plan for health services needed by the community
	HMIS VHT 007: QUARTERLY HOUSEHOLD SUMMARY	Record information and help health facility plan for health services needed by the community
	HMIS VHT 009: HEALTH UNIT QUARTERLY VHT ICCM SUMMARY	To summarize VHT/ICCM data received from VHTs within the health facility catchment area
	HMIS VHT 008 HEALTH FACILITY QUARTERLY VHT SUMMARY	To summarize VHT/ICCM household data received from VHTs in the village
	HMIS FORM 097b: VHT/ICCM QUARTERLY REPORT	Record information and help health facility plan for health services needed by the community
Supervision and Reporting	HMIS 105 Section 6: HEALTH UNIT OUTPATIENT MONTHLY REPORT	EMHS monthly reporting of stock availability, consumption for 41 tracer items, expiries
	HMIS FORM 033b: HEALTH UNIT WEEKLY EPIDEMIOLOGICAL SURVEILLANCE REPORT	Tracer medicines and HIV test kits stock availability weekly reporting.
	HMIS VHT 009: HEALTH UNIT QUARTERLY VHT ICCM SUMMARY	To summarize VHT/ICCM data received from VHTs within the health facility catchment area

Source: Uganda Health Management Information System (MoH, 2018)

21.3. Electronic Logistics Management Information System (eLMIS)

One of the identified priorities in the National pharmaceutical sector strategic plan II, Uganda's National Development Plan II and the Health Sector Strategic and Investment Plan II is eHealth as a key enabler for supporting the health system to deliver good health services to the population. The adoption of eHealth is viewed as a solution to some of the key challenges facing the health sector like weak health information management and inefficiencies of the healthcare system which result in sub-optimal resource utilization. To guide the transition from manual to electronic systems, MoH developed the Uganda eHealth Policy[9], a five-year Uganda Health Information and Digital Health Strategic Plan 2020/21 -2024/25[10] and a ten-year roadmap for GOU's health supply chain self-reliance.

Strategic Objective 5 of the eHealth Pillar 3 entitled eHealth Services, Information Sharing and Data Management is "To Strengthen the National Electronic Logistics and Supplies Management Information System to ensure adequate quality and quantities of health commodities are always available at the point of service to meet patient demand".

For stakeholders and managers to make appropriate supply chain planning and decisions to meet end user needs, timely and quality information is required. Technology platforms employing appropriate LMIS systems can assist in the necessary data collection, processing and dissemination[11].

An effective eLMIS should provide integrated access to:

1. Accurate, timely & routine consumption data
2. Real-time logistics management capabilities covering point of origin to point of consumption
3. Demand forecasting, capacity planning & modelling based on consumption.
4. Triangulation of Supply Chain data and Patient Statistics

21.4. Categorization of Electronic Logistics Management Information System (eLMIS)

Owing to the complexity of supply chain operations at various levels of the health supply chain, different ELMIS systems are available at these levels i.e.,

21.4.1. National level i.e., central warehouses

National Warehouses: The national warehouses utilize Enterprise Resource Planning (ERP) which integrate various departments and functions within the warehouses into a single comprehensive system. The ERP systems cover multiple areas such as Human resource, finance, inventory management, customer relationship management among others. The national warehouses should operate and use the most robust and efficient ERP system(s) available with Client Self Service Portal (CSSP) functionality to facilitate health facility ordering and reporting. These should allow system-to-system interoperability and data sharing across government agencies and health facility eLMIS to enable seamless data sharing and visibility.

21.4.2. Sub-National level I.e., Health facilities and/or district stores

Health Facility eLMIS: The design of any eLMIS platform should be informed by or mirror the MoH approved LMIS tools to facilitate existing data gathering, processes and management. Furthermore, standardization and inter-operability is required to enable input into the national HMIS database like Pharmaceutical Information Portal (PIP), District Health Information System 2 (DHIS 2), MoH

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[9] Uganda Ministry of health, 2016. eHealth Policy

[10] Uganda Ministry of Health, 2017. Uganda National eHealth Strategy 2017 – 2021.

[11] Program for Appropriate Technology in Health. Requirements for Logistics Management Information Systems. Seattle, WA: Program for Appropriate Technology in Health; 2010.

approved Electronic Medical Records and warehouse ERPs among others. The eLMIS should have the capability to adequately track dispensed to patient commodity data. eLMIS will enable comprehensive tracking of all commodities managed at various levels of care, providing quick access to information for decision making to improve commodity availability and hence health outcomes for the population. The introduction of any new HF ELMIS should be guided by the approvals of the various MoH TWG including Medicine Procurement and Management (MPM), Health Information, Innovation and Research (HIIRE). In addition, it should meet the requirements stipulated in table below depending on the scope of the supply chain process community.

Table 30: Functionality Requirements for Computerized LMIS Tools

Supply Chain Process	eLMIS Tool Requirements	Objective
Procurement and Ordering	• Ability to auto generate electronic copies of procurement and ordering HMIS tools • Ability to incorporate product coding as per National product registry. • Ability to track facility budget utilization • Ability to prioritize ordering of supplies by VEN / ABC classification • Ability to generate electronic orders for auto importation into warehouse systems • Keep a record of all orders made	To computerize the ordering process to ease ordering, improve order accuracy and reduce order processing lead time.
Receipt of Commodities	• Incorporate functionality to receive items based on orders • Ability to cater for donated items • Track medicines and medical supply details (Dosage form, strength, expire date) • Track receipt price against order price for items • Track undelivered items	To computerize the process of receiving medicines and health supplies and match items received against orders made
Storage and Stock management	• Provide a comprehensive real time electronic stock card and overall stock summary • Ability to monitor minimum and maximum stock levels • Ability to monitor expiries • Ability to generate summary stock status reports at the Health Facility for management review and decision making	Computerization of stock management processes for improved record keeping and process efficiency
Requisition and Issue	• Support electronic requisitioning of items and by who • Provide functionality to issue out items • Track all issues made to various service delivery points. • Support best practices such as FEFO	Computerization of requisitioning and issuing for improved accountability
Dispensing	• Provide prescribing and dispensing functionality • Ability to integrate standard treatment guidelines • Support unique patient registration or ability to link with patient registration systems • Ability to link with electronic medical record systems • Ability to track cost for dispensed items • Ability to incorporate patient regimens • Ability to monitor adherence	To computerize the dispensing process to improve accountability in the last mile of the health supply chain

Supply Chain Process	eLMIS Tool Requirements	Objective
Consumption reporting	• Ability to auto generate detailed consumption reports • Ability to auto generate summary consumption reports for various use categorizations • Ability to transmit logistic summaries to national level and link with other systems	To ease the report generation process

Redistribution	• Integrate functionality to support the redistribution process i.e.
	  ○ Decision analytics on proposed redistribution items & quantities
	  ○ external requisitioning & issuing
		To support existing logistics processes

Monitoring & Supervision	• Ability to auto compute programmatic and strategic indicators.	To support existing logistics monitoring & supervision processes
Disposal	• Incorporate functionality for formally disposing spoilt, expired or damaged items • Ability to track all disposed items • Integrate reverse logistics functionality	To support existing logistics processes

21.5. The Pharmaceutical information Portal

The Pharmaceutical Information Portal (PIP) is the MoH One-stop health supply chain data warehouse/repository and business intelligence system in Uganda (The PIP is not an eLMIS). With system-to-system linkages to health facility eLMIS and the warehouse ERPs, the PIP uses advanced computational and analytical capacity to generate interactive national stock status dashboards and reports i.e., Warehouse Online Stock Status Report (OSSR) and Online Facility Stock Status Report (OFSSR). Figure xxx showing the landing page of PIP.

Figure 56: Landing page of the PIP

Additionally, National health product and supplies master catalog, MOH pharmaceutical documents and publications Library, Databases for sub-national teams and Public Health Emergency (PHE) eELMIS are all housed in the PIP.

Furthermore, the PIP through digital tools captures and processes data on HFs self-assessment and onsite evaluation i.e., the Digital Supply-chain Performance Self-Assessment Strategy (DSPSS) and Supervision, Performance Assessment and Recognition Strategy (SPARS) tool performance of which is summarized is interactive dashboards. The Health Supply Chain (HSC) eLearning module in the PIP aids in building the capacity of health professionals across all levels of care in health supply chain management.

21.5.1. User Accounts for the PIP

To access the PIP, each user will require an account that meets the MOH and GOU data protection requirements. Accounts will be created through an application process that involves filling out the PIP user creation form which will be submitted to the MOH DPNM and DHI team for consideration.

22. CHAPTER | 22 | CAPACITY BUILDING FOR THE MANAGEMENT OF EMHS SUPERVISIONS

22.1. Introduction

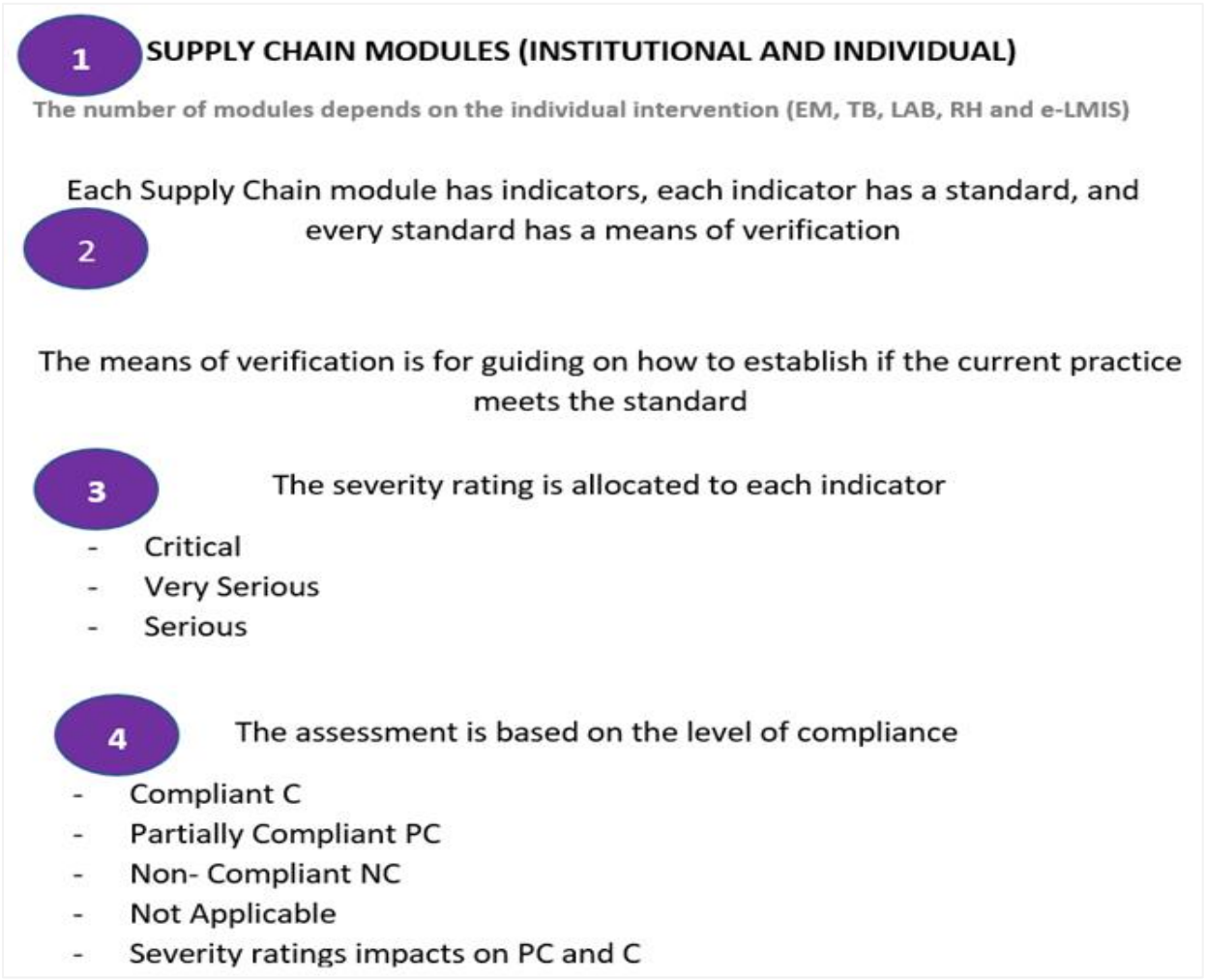
Ensuring the adequate availability and appropriate use of essential medicines and health supplies (EMHS) is critically important to the health of the Ugandan people. The Ministry of Health has prioritized the building of the capacity of health workers in medicines management as a key strategy to optimize the use of limited resources, reduce waste and improve health outcomes at all levels of health care. The health sector continues to experience some challenges in; quantification practices, stock and storage management, logistics reporting, prescribing and dispensing of medicines due to staff transfers, high staff turnover in majorly private sector and lack of designated supply chain government staff in lower-level health facilities.

To address these challenges, the Ministry of Health Pharmacy Department, developed the Digital Supply-chain Performance Self-Assessment Strategy (DSPSS) to build sustainable EMHS management capacity in public and private-not-for-profit health facilities throughout the country. DSPSS is a quality improvement intervention strategy that focuses on both the individual and institutional health supply chain indicators. It involves self-administration of tool with questions that speak to different institutional and individual indicators. It is linked with eLearning platform which provides for just in time skills gap filling. To enhance the role of leadership, management and governance for supply chain, the DSPSS is linked to the leadership arm at the health facility, District and Ministry. This provides for timely follow up on action plans auto generated during the self-assessment.

22.2. The Digital Supply-Chain Performance Self-assessment

DSPSS is based on the successes of SPARS implementation to enhance the likelihood of positive change. The strategy uses a self-administered tool covering EMHS, ART, TB, RH, LAB and eLMIS supply chain improvement interventions with 36 individual and 30 institutional indicators clustered under the different interventions (see table 1). It still combines educational, Leadership, and recognition mechanisms with performance self-assessment to improve medicines management practices at health facility level. The education intervention is auto provided by the direct linkage to the eLearning platform therefore this does not entirely rely external. The leadership mechanism is provided for by auto linkages and system notifications to the leaders and managers at the different levels of service delivery. The recognition component is realized through appreciation notifications to individuals or any other tangible reward that fit within the available facility, district, IP, or ministry of health budget.

Figure 57: DSPSS Tool Structure Weightings and Scoring



The tool provides for the indicator, the indicator standard, criteria for assessment and scoring.

The indicators are weighted as Critical, very severe, and Severe.

The weighted average of criteria compliance indicates the level of standard compliance.

Table 31: DSPSS ratings and scores

Rating	Score
C	100
PC	50
NC	0

A standard with critical criteria forms the basis of a risk management program and priority setting: If a critical indicator is scored as Non-Compliant (NC): the whole indicator scores a maximum of 0 (NC), regardless of the average score of all the indicators. If a critical indicator is scored as Partially

Compliant (PC); the whole indicator scores a maximum of 50 (PC), regardless of the average score of all the indicators.

Figure 58: Criteria for DSPSS/Self-Assessment

Figure 59: Self-assessment and eLearning linkage structure

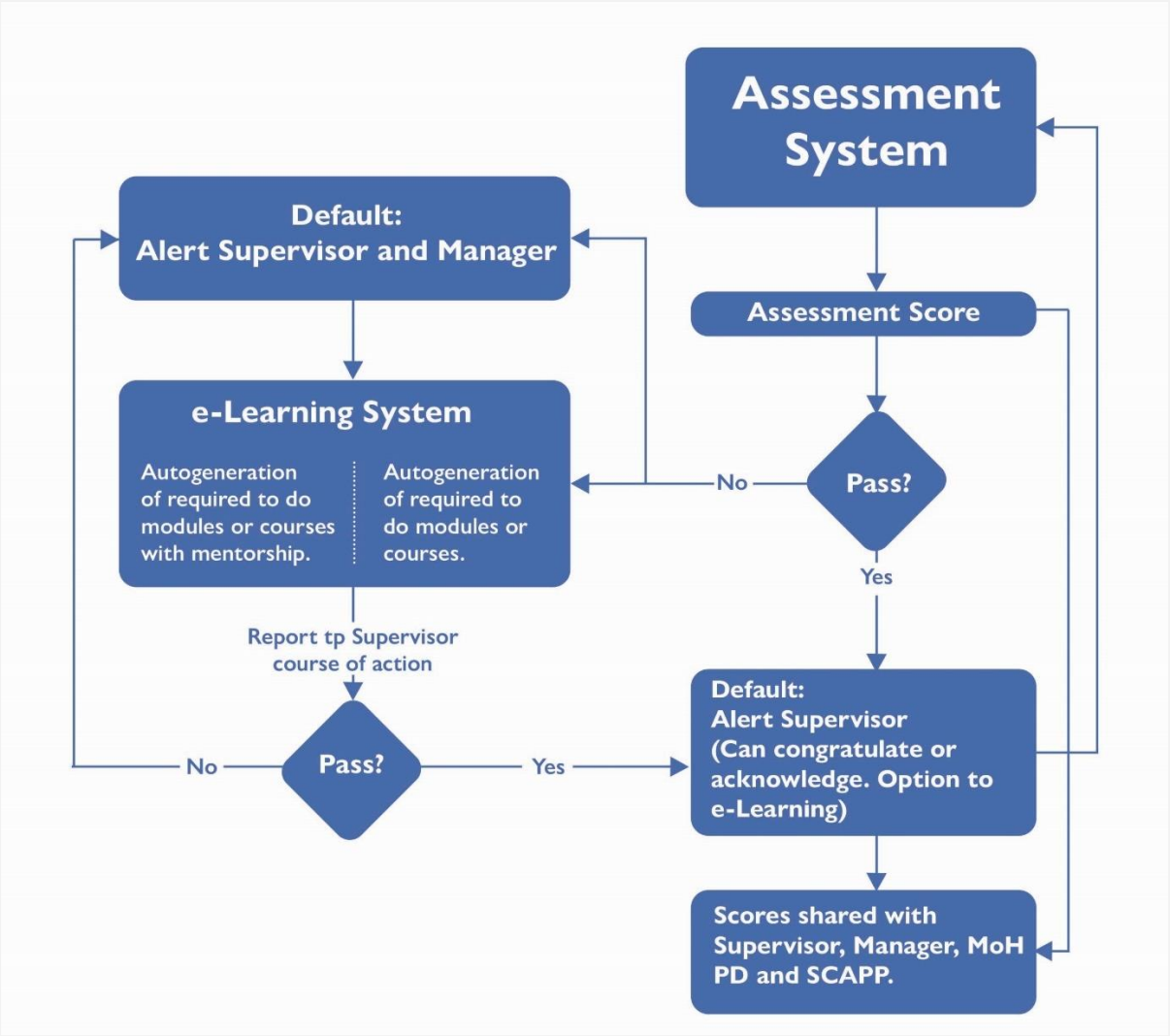


Figure 60: DSPSS indicators

INDIVIDUAL (36 indicators)
1. Prescribing and dispensing quality
1.1. Adhering to Care and treatment guidelines
1.2. Antibiotic and Injection us at OPD
2. Pharmacovigilance
2.1. Screening for suspected ADRS for ART and TB patients
2.2. ADR reporting
2.3. Supplies for PV
3. Forecasting and Supply Management
3.1. Forecasting for EMHS
3.2. Use of information for supply planning
3.3. Vetting
3.4. Adherence to the procurement plan
4. Ordering
4.1. Timeliness of orders
4.2. Ordering integration
4.3. Supplies' records keeping
5. Supply Chain Reporting
5.1. HMIS 105 Section 6 reports.
5.2. Completeness of Section 6 of HMIS 105
5.3. Accuracy of HMIS 105 section 6
6. Inventory Management
6.1. Availability of EMHS
6.2. Use of tools for stock management
6.3. Stock verification
6.4. Commodity traceability from supplier to facility
6.5. Commodity traceability from facility store to the user unit
6.6. Commodity traceability from user unit to the client/patient
6.7. HIV test kits traceability

INDIVIDUAL (36 indicators)
6.8. Management of Spoilt and expired EMHS
6.9. Developing and maintaining facility lab equipment inventory
6.10. Laboratory Equipment management plan to ensure functionality
6.11. Internal Quality control
7. eLMIS
7.1. Use of eLMIS
7.2. eLMIS updated
7.3. Accuracy of eLMIS data
8. Pharmacy, Laboratory and Stores Management
8.1 Hygiene of the Pharmacy and store
8.2. Hygiene of the laboratory
8.3. Temperature monitoring
8.4. System for storage of laboratory reagents

22.3. Health Supply Chain (HSC) eLearning

The Digital Supply Chain Performance Self-assessment (DSPSS) is linked to the eLearning platform which provides for just in time skills gap filling in case of deficiencies realized after the self-assessment. The eLearning platform is meant to address the skills gaps in individual indicator performance while the institutional gaps are addressed through the HSC leadership, Management and Governance arm. Also, the e-learning platform will enhance the capacities for HSC leadership at national, regional, district and facility level Health supply chain management, leadership, management and governance orientation modules are available for this purpose on the Pharmaceutical Information Portal (PIP)

22.4. DSPSS Implementation

The following are key steps for effective implementation of DSPSS by implementing partners.

22.4.1. PIP accounts creation

DSPSS implementation requires all users to be created into the Pharmaceutical Information Portal (PIP). These are given a username and the password. This provides for the PIP data security and regulated access. Each supply chain person engaging in self-assessment should have an account in PIP. The request for accounts creation is to the Division of Health Information (DHI) Ministry of Health.

22.4.2. Tools required

Each facility should have a computer, a laptop, or a tablet with connection to a reliable source of internet. Ministry of Health, with support from partners, has been able to provide computers to several health facilities. The Ministry of ICT through NITA-U committed to extend the internet backbone to priority health facilities across the country. However, partners have also continued to support in this area.

22.4.3. Roles of DSPSS stakeholders

DSPSS has a wide range of stakeholders from the Ministry of Health Department of Pharmaceuticals and Natural Medicine to the health facilities. Key responsibilities of these stakeholders in DSPSS implementation are outlined below.

22.4.3.1. MoH Department of Pharmaceuticals and Natural Medicine

- Strategic leadership, policy and guidelines formulation, oversight, and coordination to ensure effective and uniform DSPSS implementation and sustainability.
- Monitoring, evaluation, tracking and reporting of DSPSS implementation, performance, efficiency, and effectiveness by facilities.
- Targeted support supervision to identified weak performers to facilitate DSPSS implementation, identify issues and take necessary corrective actions.
- Resource mobilization for supporting gaps identified by DSPSS, Good Pharmacy Practices and supportive supervision such as appropriate medicines storage infrastructure including cold storage facilities.
- Host and maintain the Pharmaceutical Information Portal in close collaboration with the Ministry of Health Department of Health Informatics (DHI), optimize data quality and data utilization.
- Provide guidance on computer hardware management, replenishment, and security.
- Enforce enrolment of facilities into DSPSS (self-assessment).

22.4.3.2. Regional Pharmacist

- Coordinate medicine management activities within a region with districts and implementing partners.
- Performance management of DSPSS and medicines management implementation in their region.
- Capacity building support supply chain staff in their regions including peer support at poor performing facilities.
- Regular reporting to Ministry of Heath DPNM on medicines situation in their regions and facilities.

22.4.3.3. Partners

- Support and manage comprehensive DSPSS implementation to all facilities in supported districts.
- Implement and support activities necessary for DSPSS set up and implementation at district level including orientation of facility supply chain staff in DSPSS, supportive supervision, computer skills information use and defensive driving.
- Work with district ICT officers to ensure good management and maintenance of the hardware.
- Conduct regional DSPSS quarterly performance.
- Support in enrolment of staff for eLearning and monitor completion where applicable.

22.4.3.4. Chief Administrative Officer

- Maintain custody and ensure proper use and repair of equipment provided to districts in support of SPARS implementation like; computers, motorbikes; modems; shelves etc.
- Participate in DSPSS joint support supervision with implementing partners.

22.4.3.5. District Health Officer/ District Health Team

- Overall supervision and management responsibility for medicines management activities in the district.

- Assess medicines management performance, manage and support
- health facilities in EMHS management.
- Coordination with higher level Ministry of Health on medicines management issues.
- Participate in the peer support supervision of poor performing.
    - Health facilities
    - Manage district logistics coordination meetings.
- Progress reporting to the district Chief Administrative Officer on medicines management in the district.

22.4.3.6. District Medicines Management Supervisors

The district-MMS is the focal person for all medicines management and logistic activities in the district and will be responsible for DSPSS planning, implementation, reporting and use of information for decision making. The district-MMS has the following specific roles in DSPSS implementation.

- Coordination of medicines management activities within the district and with regional pharmacists
    - Focal person for medicines issues within the District Health Team
- Work closely with district technical programs officers and focal persons to ensure coordination of efforts to improve availability of EMHS.
- Targeted Coordination, mentorship and supervision of poor performing health facilities.
- Coordinate eLearning enrolment for HSC staff within the district.
- Coordinate development and management of district medicines management work plans.
    - Monthly reporting on medicines situation in the district to the District Health Officer.
- Participate in joint support supervisions with the regional Pharmacist, & District Health Officer.
    - Support district logistics coordination meetings.

22.4.3.7. HSD Medicines Management Supervisors

The HSD MMS on the other hand is responsible for medicines management activities within his designated HSD. The HSD MMS supports the District MMS in planning and implementation of medicines management activities within the HSD. The HSD-MMS has the following specific roles in DSPSS implementation.

- Responsible for overall DSPSS implementation, performance management and reporting in the HSD of responsibility.
- Implement DSPSS at lower-level health facilities in the HSD of responsibility.
- Implement other logistic or medicines management interventions in the HSD such as CSSP and WAOs ordering.
- Coordinate the enrolment of HSC HSD staff for eLearning where applicable.
- Monthly reporting on medicines situation in the HSD to District- MMS and the District Health Officer.
    - Participate in joint support supervisions activities with the district MMS
    - Participates in district logistics coordination meetings

22.4.3.8. Health facility staff

- Perform the quarterly self-assessment.
- Use performance information for decision making to improve practices at facility level.
- Enrol for eLearning to boost HSC performance where necessary.
- Update other facility staff and the in charge about the outcomes of each quarterly self-assessment done.

22.4.3.9. Health facility in charge

- Enforce quarterly self-assessment.
- Monitor and track improvements in medicines management.
- Use performance information for decision making to improve practices at facility level.
- Enforce enrolment for eLearning to boost HSC performance where necessary.

22.4.4. Training and skills development for DSPSS

Health facility supply chain personnel are offered on job technical support. Taken through the online DSPSS self-assessment tool, user rights created and supported to self-assess and submit the initial assessment results. Ministry and implementing partner officials visit the facilities on a quarterly basis to; verify the authenticity of the self-assessments, follow up on action areas generated during the elf-assessments and bridge any identified technical gap.

22.4.5. Mitigation of fraud

To mitigate the risk of concocted self-assessment, the facility in charge is required for a debrief after the assessment from the pharmacist, dispenser, inventory management officer or ant one tagged with this responsibility., the Ministry of Health DPNM will from time to time visualize the submitted self-assessment results submitted into PIP and make targeted technical support visits. These visits will target a mix of highly performing and nonperforming facilities.

22.5. The Role of SPARS in DSPSS Implementation

On recommendation of DPNM or on request by facility in charge, DHO or any office in leadership, informed by the action plans from the self-assessments, SPARS, will be used as a mechanism for targeted support. This will help to; address the non-performing indicators, Devise ways with the facility or District leadership on how to address some of the institutional challenges, address skills gaps that could not be filled through the eLearning platform.

Note: It is critical to note that DSPSS is a two-pronged approach leveraging on the capacity of the health facility individuals to self-assess and the eLearning platform for skills gap filling. The DSPSS self-assessment tool is hosted on Pharmaceutical Information Portal (PIP). It can be accessed through the URL: pip.health.go.ug. It can as well be accessed through URL: dspss.health.go.ug.

22.6. SPARS Implementation

This will be implemented to address DSPSS chronical individual and institutional performance gaps which have failed to be addressed through the eLearning platform or at lower health facilities where DSPSS hasn't been rolled out. This can be done on recommendation of the health facility, district of DPNM leadership. This will therefore to be more targeted and focused which brings about a significant yield and great maximization of resources. This will be implemented by supply chain management supervisor's team thus the Medicine Management Supervisors, Laboratory SPARS supervisors and the District TB and Leprosy Supervisors (DTLS).

22.7. Supply Chain Management Peer Supervisions

The Peer strategy is a supervision structure which utilizes the already existing cascading systems of the ministry of health from national to health facility to improve effectiveness and sustainability of EMHS supervisions. The peer strategy also further clarifies roles and responsibilities of stakeholders at all levels whereby Pharmacy department supports regional pharmacists who in turn work with the DHO to support the supply chain management supervisors in the districts. Stakeholders like implementing partners should support and work within the existing health system structures. The strategy uses the existing pharmaceutical human resources to conduct supervision. It ensures that different levels of support focus on specific geographical areas, supervisors have manageable number of supervisees and are accountable (Figure 61).

22.8. Medicines Management Supervisions at Ward Level

Through training, pharmacy professionals (Pharmacists and Pharmacy Technicians) are capacitated to manage medicines throughout the entire medicines management cycle. Pharmacy professionals remain the custodians of medicines and should continue to play this role at all stages. Medicines management in in-patient wards remains the responsibility of the pharmacist/ pharmacy in-charge and should therefore be managed in accordance with the Guidelines for implementation of inpatient and outpatient pharmacies[12].

22.8.1. Creating ward/unit's emergency medicines list

The pharmacist/pharmacy in-charge should reach an agreement with the ward nurses and Medicine Therapeutic Committee regarding medicine that should form part of ward emergency medicines list. Ward stock levels (daily consumptions) should be calculated by pharmacy staff using a consumption-based method and agreed upon with the ward nursing staff. This should have the names and proposed quantities to last a day or two at most. Following endorsement, a copy of the list should be made available to both the nursing staff and the pharmacy staff who will be responsible for obtaining and supplying medicine stock mainly from the inpatient pharmacy and where required the store. The pharmacist/ pharmacy in-charge should supervise this stock daily to ensure that stock is managed appropriately in all wards/units.

22.8.2. Standard operating procedures for stock management at ward level

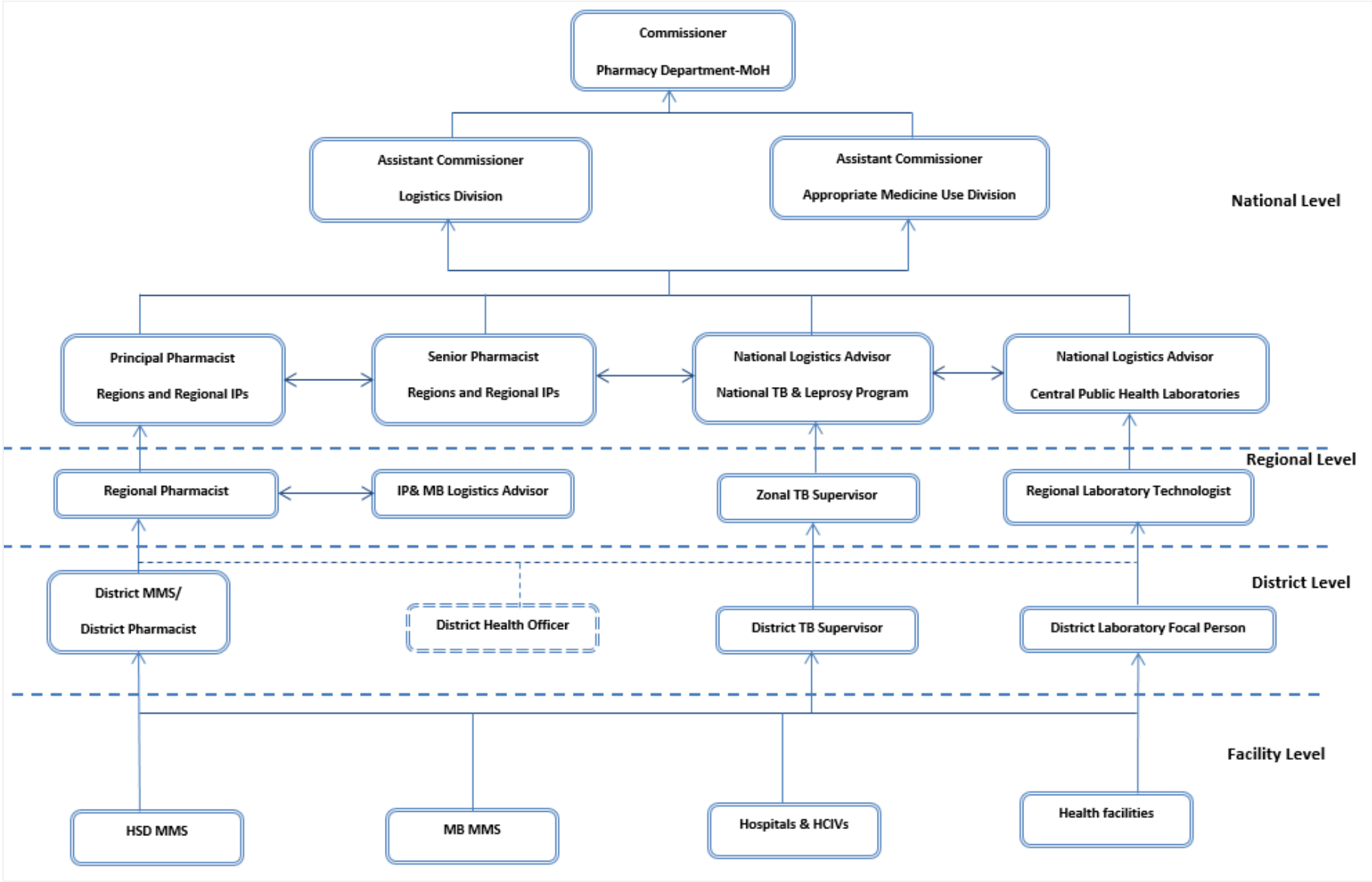
Written standard operating procedures (SOPs) must be in place and made available to provide guidance on the management of medicines on the ward/unit. They must be established to ensure adequate control of the medicines issued to the wards/units. SOPs must be agreed upon with the MTC, ward nurses and pharmacists/pharmacy in-charge and should include:

1. An indication of the nurses' responsibilities for signing approved requisition documents in compliance with the inpatient guidelines
2. Dispensing of emergency medicines to the in-patients
3. Documentation of use of medicines in the in-patient wards/units using the dispensing logs
4. Ordering for medicines after physical count is carried out to determine the quantities

Procedures for the return of medicines to the pharmacy to prevent misuse.

[12] Uganda Ministry of Health, 2017. Guidelines for implementation of inpatient and outpatients pharmacies.

Figure 61: MoH Peer support structure



22.8.3. Patient care

Nurses facilitate the use and administration of ward/unit medicines, as per the authorized prescribers' administration instructions. They should ensure that the right patient receives the right medicine, which is of a good quality, in the right dose and at the right time and provide patient counselling in regard to the storage and use of the medicines. The pharmacist/pharmacy in-charge should ensure that there is adequate medicines information for the nurse with regard to the use and storage of medicine in the ward/unit. This will assist with maintaining medicines potency and appropriate use.

22.8.4. Supervisions of medicines management at ward level

On a daily basis, the pharmacist/ pharmacy in-charge shall supervise the medicines at the ward/unit to include:

1. Medicines in the ward emergency cupboard
2. Medicines issued to the patients but not yet used.
3. Drug administration audits

22.8.5. Purpose of the supervision.

The purpose of this supervision (medicines management at ward/unit level) is to address issues that may include:

1. Inappropriate storage and handling of the medicines (both at emergency and with the in-patients)
2. Unexplained high turnover of the commodities at the emergency cupboard
3. Incomplete entry of data in the medicines management tools (e.g., dispensing log, patient charts) etc at ward level
4. Inadequate professional advice for use of medicines at the wards/units.
5. Inappropriate drug administration

23. CHAPTER | 23 | APPROPRIATE MEDICINES USE

23.1. Introduction

Medicines and Health supplies take up to 40-60% of health care budgets[13]. Medically inappropriate, ineffective and economically inefficient use of pharmaceuticals is commonly observed in health care systems. WHO estimates that more than half of all medicines are prescribed, dispensed or sold inappropriately, and that half of all patients fail to take them correctly[14]. The overuse, underuse or misuse of medicines results in wastage of scarce resources and widespread health hazards.

Promoting appropriate use of medicines (AMU) in the healthcare system is needed not only because of the financial reasons that policy makers and managers are usually most concerned with, but also is an essential element in achieving quality of health and medical care for patients and the community. Actions or intervention programs to promote the appropriate use of medicines should, therefore, be continuously implemented and systematically incorporated as an integral part of the health care system.

This chapter serves as an introduction to AMU in the health facilities and will cover:

1. Definition, examples, causes, consequences of inappropriate use
2. Core strategies to promote appropriate medicines use
3. Essential medicines concept
4. Standard treatment guidelines

23.2. Appropriate and Inappropriate Medicines Use

23.2.1. Defining Appropriate Medicines Use

The terms "appropriate" and "rational" use of medicines are sometimes used interchangeably.

Appropriate use of medicines requires that patients receive medicines appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and their community.

The requirements for appropriate use will be fulfilled if the processes of diagnosing, prescribing, dispensing and administration of the medicine are appropriately followed.

This means that the following criteria must be met:

1. ***Right diagnosis:*** defining a patient's problems correctly is important or else it would set off a cascade of inappropriate use
2. ***Right medicine:*** prescribing cost-effective, safe and affordable medicines. The issue of costs has to be considered since resources are limited, we need to make sure that we get the maximum benefit for the maximum number of people within available resources.
3. ***Right patient:*** selecting appropriate medicines for age, sex, dosage, administration route and duration, no contraindications, acceptability to the patient.
4. ***Appropriate patient information*:** patients are provided with relevant, accurate, important and clear information regarding their conditions and their prescribed medication(s), including how and when to take, importance of adherence, side effects and possible toxicity.

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[13] Uganda Ministry of Health. Uganda Health Accounts Financial years 2016/2017 and 2017/2018
[14] World Health Organization, 2011. The World Medicines Situation 2011. Rational Medicines Use

5. ***Appropriate evaluation:*** the anticipated and unexpected effects of medications are appropriately monitored and interpreted.
6. ***Right care-provider:*** the provider should have the required qualification, competence, proficiency and authorized to provide the care.

23.2.2. Examples of Inappropriate Use

Inappropriate use occurs when any of the criteria mentioned above are not met. This can occur at any stage of the medicines use process, i.e., during diagnosis, prescribing, dispensing or patient adherence. Some examples of inappropriate use are listed below:

1. Self-medication; use of prescription medicine without prescriber's authorization
2. The use of medicines when no medicine therapy is required e.g. giving medicine for social problems
3. The use of the wrong medicine for a specific condition e.g. treatment of simple diarrhoeas with antibiotics
4. The use of medicines with doubtful or unproven efficacy e.g. use of multivitamins without evidence of deficiencies
5. The use of medicines of uncertain safety status e.g. unlabelled medicines
6. The use of unnecessarily expensive medicines, e.g. the use of a third generation, broad-spectrum antimicrobial when a first-line, narrow spectrum agent is required
7. Over-use of injections when oral formulations would be more appropriate
8. Multiple or over-prescription per patient (poly pharmacy)
9. Dispensing/administration mistakes: incorrect dose, route of administration, duration, wrong label, incomplete instructions to patients
10. Inappropriate use at patient's and community level: poor compliance, incorrect route/dose and sharing of medicines.

23.2.3. Factors That Influence Appropriate Medicines Use

A wide range of factors cause problems in medicine use. Before trying to correct any problem in medicine use, it is helpful to identify which factors are most important in causing the problem at hand. Unless the proposed intervention targets the appropriate causes of the problem, it is unlikely to be successful. The major factors can be categorized as those derived from patients, prescribers, the workplace, the supply system including industry influences, social and cultural influences, regulation, medicine information and misinformation, and combinations of these factors.

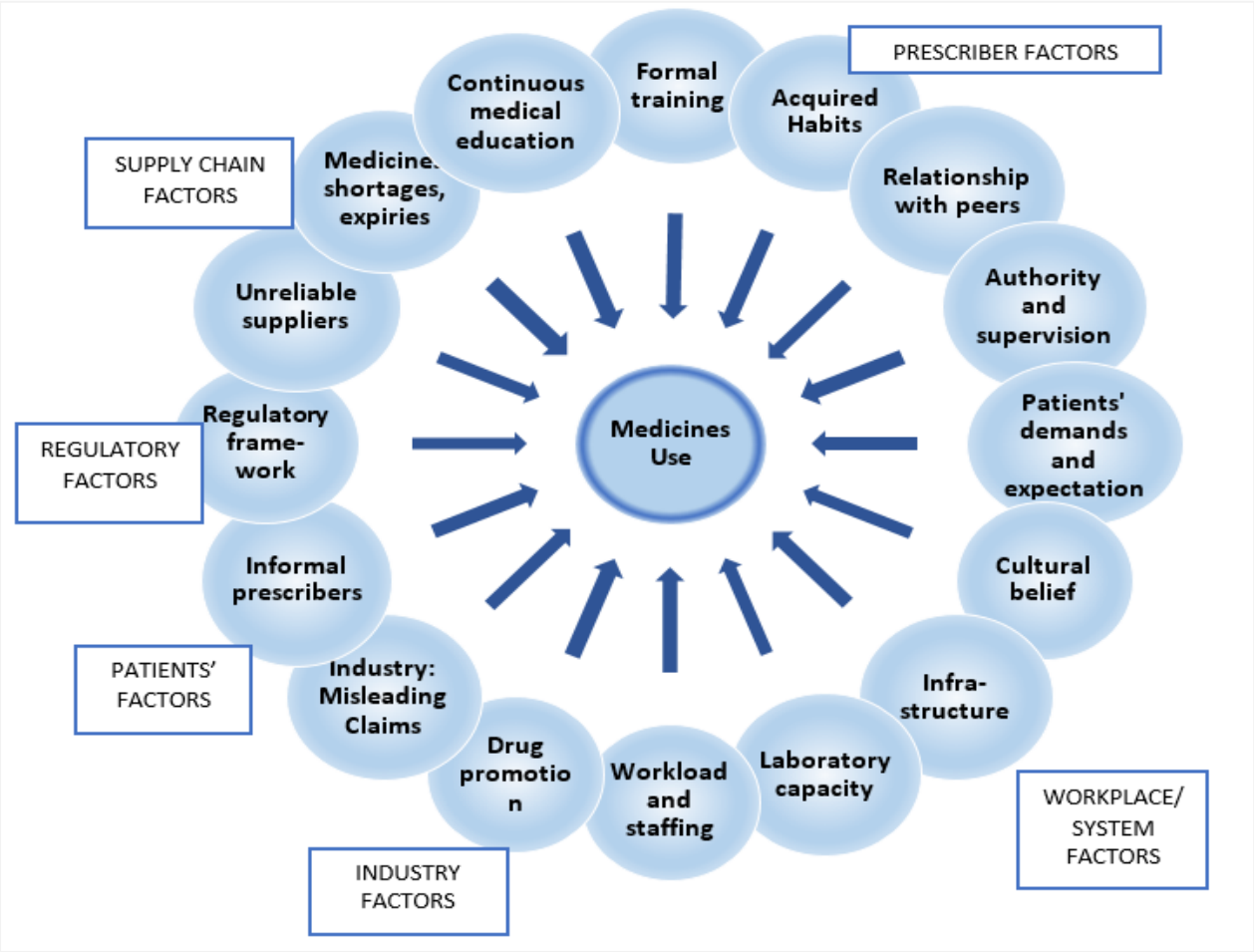
23.2.4. The Impact of Inappropriate Medicines Use

The impacts of this inappropriate use of medicines can be seen in many ways:

1. Reduction in the quality of medicine therapy leading to increased morbidity and mortality.
2. Wastage of resources leading to stock outs, reduced availability of other vital medicines and increased costs.
3. Increased risk of unwanted effects such as adverse medicine reactions and the emergence of medicine resistance, e.g., malaria or multidrug resistant tuberculosis.
4. Psychosocial impacts, such as when patients come to believe that there is "a pill for every ill." This may cause an increased demand for medicines and more inappropriate use, often by self and unauthorized prescription.
5. Irrational use of medicines can also compromise the trust in the health system.

IMPORTANT TO NOTE: Medicine use is a critical part of the care process. Ensuring that the correct medicine is given to the correct patient is a high priority for all health professionals. Improving medicine use improves the quality of care and lowers the cost of care.

Figure 62: Factors influencing appropriate medicine use



23.2.5. Key Strategies to Improving Medicines Use

The World Health Organization advocates 12 key interventions/strategies to promote rational use of medicines. The *Uganda National Medicines Policy 2015-2020* also proposes these strategies to ensure that end-users receive maximum therapeutic benefits from medicines.

Table 32: WHO Core Interventions/strategies for promoting Rational Medicines Use

WHO Core Interventions/strategies for promoting Rational Medicines Use
1. Establishment of a multidisciplinary national body to coordinate policies on medicine use
2. Use of clinical guidelines
3. Development and use of national essential medicines list
4. Establishment of drug and therapeutics committees (also called Medicine and Therapeutics Committees) in districts and hospitals
5. Inclusion of problem-based pharmacotherapy training in undergraduate curricula
6. Continuing in-service medical education as a licensure requirement
7. Supervision, audit and feedback
8. Use of independent information on medicines
9. Public education about medicines
10. Avoidance of perverse financial incentives
11. Use of appropriate and enforced regulation
12. Sufficient government expenditure to ensure availability of medicines and staff

In Uganda, the Pharmacy Department of the Ministry of Health is the institutional body responsible for implementing the appropriate medicine use program.

23.3. Standard Treatment Guidelines

Standard treatment guidelines are systematically developed clinical recommendations that assist prescribers in deciding on appropriate treatments for specific clinical problems. These guidelines usually reflect the consensus on the optimal treatment options within a health facility or health system. The information is disease-centred, emphasizing the common conditions, their diagnoses and the various treatment alternatives. They assist and guide doctors, pharmacists, dispensers, and other healthcare staff who prescribe at primary care facilities in providing quality care to patients[15]. Standard Treatment Guidelines provide the basis for assess appropriateness of medicine use and are therefore at the core of any work in appropriate medicine use.

The Uganda Clinical Guidelines (UCG) help to achieve these standards by presenting updated, practical, and useful information on the diagnosis and management of common conditions in Uganda. The 2016 UCG is the basis for the Essential Medicines and Health Supplies List of Uganda (EMHSLU) 2016[16]. In addition to the Uganda Clinical Guidelines 2016, it is recommended that programs and specialized health unit can develop specialized guidelines for specific conditions for example the 2016 Consolidated Guidelines for Prevention and Treatment of HIV in Uganda and the ICCM Implementation Guidelines.

23.3.1. Key considerations in developing standard treatment guidelines

1. Target priority conditions
2. Local disease factors (e.g., environment, housing, transportation, healthcare system etc.)
3. Consultation with special programs and eminent clinicians (e.g., surgeons, specialized physicians)
4. Focus on use of fewer and only necessary drugs listed in the essential drug list (Cost effective treatments)
5. Provide dose and duration, contraindications, side effects adverse drug reactions
6. Consider patient perspective such as preferred formulations

23.3.2. Rationale and benefits of treatment guidelines

STGs promote high quality of care across the health system by:

1. Linking scientific evidence to clinical practice
2. Promoting appropriate use of resources
3. Guiding procurement/supply of pharmaceuticals
4. Guide training
5. Promoting standards of care

Table 33: Justification for the use of standard treatment guidelines

Stakeholders	Challenge addressed
Patients	• Consistency amongst prescribers reduces confusion and increases compliance • Focuses on the most effective treatments • Improves drug supply, since fewer options are procured
Providers	• Generates expert consensus on most effective, economical treatment for a specific setting • Allows prescribers to focus on diagnosis more than learning treatments • Provides a standard for assessment of quality of care

[15] Gopalakrishnan S, 1999. Standard Treatment Guidelines. TNMSC Times, 1, 7–8.
[16] WHO, 1977. The Selection of Essential Drugs. Report of a WHO Expert Committee.

Stakeholders	Challenge addressed
	• Provides a simple basis for monitoring and supervision
Supply management staff	• Eases distribution and redistribution of medical supplies • Allows for pre-packaging (Course of therapy dispensing) for common conditions • Improves predictability of medicines demand and so forecasts become more reliable
Health policy makers	• Provides a method to control costs by improving efficiency • Serves as a basis for assessment of quality of care • Allows better integration of special programs

Table 34: Benefits of standard treatment guidelines for different stakeholders

For health officials/practitioners	For Managers
1. Evidence based guidance 2. Improved diagnostic accuracy 3. Effective and safe therapy 4. Standardized information for patients 5. Support evidence/protection/defence against malpractice 6. Comprehensive guidelines inclusive of special programs	7. Tools to measure, monitor and improve performance and quality of care 8. Standardized basis for quantifying, ordering and procuring supplies 9. Basis for health workers training 10. Tool to enhance efficiency/appropriate use of resources
For supply management staff	**For Patients**
11. Identifies which medicines should be available for the most commonly treated problems 12. Facilitates pre-packaging of course-of-therapy quantities of commonly prescribed items	13. Optimal treatment, better outcomes at lower costs 14. Consistent quality of care across health system which encourages adherence 15. Better availability of medicines 16. Prevention of development of resistance for antimicrobials

23.3.3. Uganda Clinical Guidelines

Uganda has had five editions of national standard treatment guidelines published in 1993, 2003, 2010, 2012 and 2016 respectively. The Uganda Clinical Guidelines (UCG) is a comprehensive document containing information on features, diagnosis and management of most common conditions in Uganda. It indicates for each condition the level of care at which the necessary expertise and medicines to manage are available, which in turn helps health workers to refer patients to the appropriate level when needed. Getting the diagnosis correct is a very important first step in appropriate patient management, and therefore the UCG 2016 in addition is harmonized with "**laboratory test menu"** and the EMHSLU 2016 which indicate the tests, medicines and health supplies available at the different levels of care.

23.3.3.1. Principles and use of the UCG

The principles on which the UCGs are built include:

1. ***Health priorities***: conditions are selected based on their prevalence/incidence (how many people are affected) and their severity (the risk of death or disability, the effect on quality of life)
2. ***Scientific evidence*** for effectiveness of the treatment for a given condition (evidence-based medicine). The steps of identifying and assessing scientific evidence is generally entrusted with

the academic specialists (experts) for each given therapeutic area and the vertical programs of the MOH. In addition, Uganda largely adopts/adapts WHO recommendations for the management of many conditions, which have already undergone the critical appraisal processes.

3. ***Cost-effectiveness***: alternatives are selected based on the relationship between the cost and the outcome. Options which provide more value (outcome) for money are obviously preferred!
4. ***Appropriateness/implementability*** for our setting and the level of care within the Ugandan health care system: the selected alternative has to be affordable, implementable (the conditions for its implementation have to exist: e.g. in terms of infrastructure, staffing etc.), and acceptable, both to health workers and patients.

23.4. Essential Medicines Concept

Essential medicines have been defined as medicines *that satisfy the health care needs of the majority of the population, at a price they and the community can afford*[17]. They therefore must be available at all times, in adequate amounts and in the appropriate dosage forms. The Essential Medicines Concept (EMC) is a public health principle that promotes efficient use of resources by establishing and using a limited list of carefully selected medicines. The concept is based on the observation that:

1. Majority of health problems can be treated with a small number of medicines.
2. In practice, health professionals routinely use fewer than 200 medicines. Training and clinical experience should focus on the proper use of these few medicines.

Table 35: Benefits of the Essential Medicines Concept

Benefits of the Essential Medicines Concept
1. Better therapy as clinicians become knowledgeable with a manageable number of medicines 2. Procurement and distribution is more efficient and cost effective with fewer medicines 3. Medicine ordering and storage at the facility is also easier with a limited number of medicines 4. Patients can be better informed when fewer medicines are used **5.** Formal education and in-service training of health professionals and of public education is easier

23.4.1. Uganda Essential Medicines List

Uganda has implemented the Essential Medicines Program since 1985. The first EMLU was published in 1991, and subsequently in 1996, 2001, 2007, 2012 and the current edition in 2016. Since 2012, the Essential Medicines List (EML) also contains the **health supplies and laboratory supplies** that are needed at the health facilities. This was to ensure a comprehensive document that can suitably guide procurement by the warehouses and assure availability of all supplies needed to deliver optimal care at health facilities.

Both the 2012 and the 2016 editions of the EMHSLU are harmonized with the clinical guidelines (UCG) to ensure that all the medicines recommended in the UCG are listed in the EMHSLU. In addition, the EMHSLU also contains **specialist medicines** required for diagnosis and treatment of conditions where specialized care or monitoring is required such as cancer, ophthalmology and dialysis. The items in the EMHSLU are therefore classified by "***level of care***", which indicates the lowest level of health facility at which the medicine will be available, basing on the expected level of expertise and capacity in terms of qualification of staff, diagnostic capability and available infrastructure.

[17] WHO, 1977. The Selection of Essential Drugs. Report of a WHO Expert Committee.

The main inclusion criteria for medicines on the EMHSLU overlap with the principles used to develop the STG such as efficacy, safety, quality, cost-effectiveness and appropriateness.

23.4.2. Institutional Medicines List (IML)

The EMHSLU of Uganda is developed at central level, and it contains a wide range of medicines/formulations, (approximately 600 items). Not all these are required at all facilities, and therefore it is expected that each health facility develops its own **institutional medicines list** (IML, sometimes called **hospital formulary**), out of the national EMHSLU. This has the benefits of streamlining procurement within a limited budget, eases monitoring of stock, fosters adherence to treatment guidelines and eases training of health workers.

The same criteria used for the national EML may be adopted for selecting items for the institutional medicines list, for example:

1. Morbidity patterns of the hospital's patients
2. Allocated budget for pharmaceuticals (medicines and sundries)
3. Available expertise at the hospital (e.g., is there a dental clinic, eye clinic etc.)
4. VEN classification of the items

23.5. Practical Guidelines for Dispensing

In order to use medicines appropriately, health care professionals and the public need access to up-to-date, unbiased, accurate and evidence-based information about these medicines. Drug promoters from manufacturers and suppliers often and aggressively provide biased information, over-emphasizing the advantages and under-emphasizing the adverse effects of the medicines they are promoting. This can pressurize prescribers into prescribing expensive or unnecessary medicines that are outside of the essential medicines list.

The MOH Pharmacy Department has developed and distributed two medicines information reference books, the "Practical Guidelines for Dispensing (PGD) for lower level (2014) and Practical Guidelines for Dispensing (PGD) for higher level health facilities (2015)". These provide information and instructions about the medicines in the Uganda essential medicines list, such as indications, dosage, side effects, important interactions, special instructions for patients, use during pregnancy and breastfeeding and special cautions to look out for while using those medicines. The PGD is designed to serve as a quick reference book, with only the most critical information included, aggregated from across several reliable and evidence-based sources of information.

24. CHAPTER | 24 | MEDICINE AND THERAPEUTICS COMMITTEES

24.1. The scope of Medicine and Therapeutics Committee (MTC)

The MTC has a direct role in the components of selection, use and accountability, but it also has an advisory and monitoring role on the more "logistical" steps of the medicines management cycle, which are direct responsibility of the store-pharmacy-procurement departments. The medicine management cycle consists of a sequence of steps as represented in Figure 63. Figure 63: Scope of action for MTC in the medicine management cycleFigure 63

Figure 63: Scope of action for MTC in the medicine management cycle

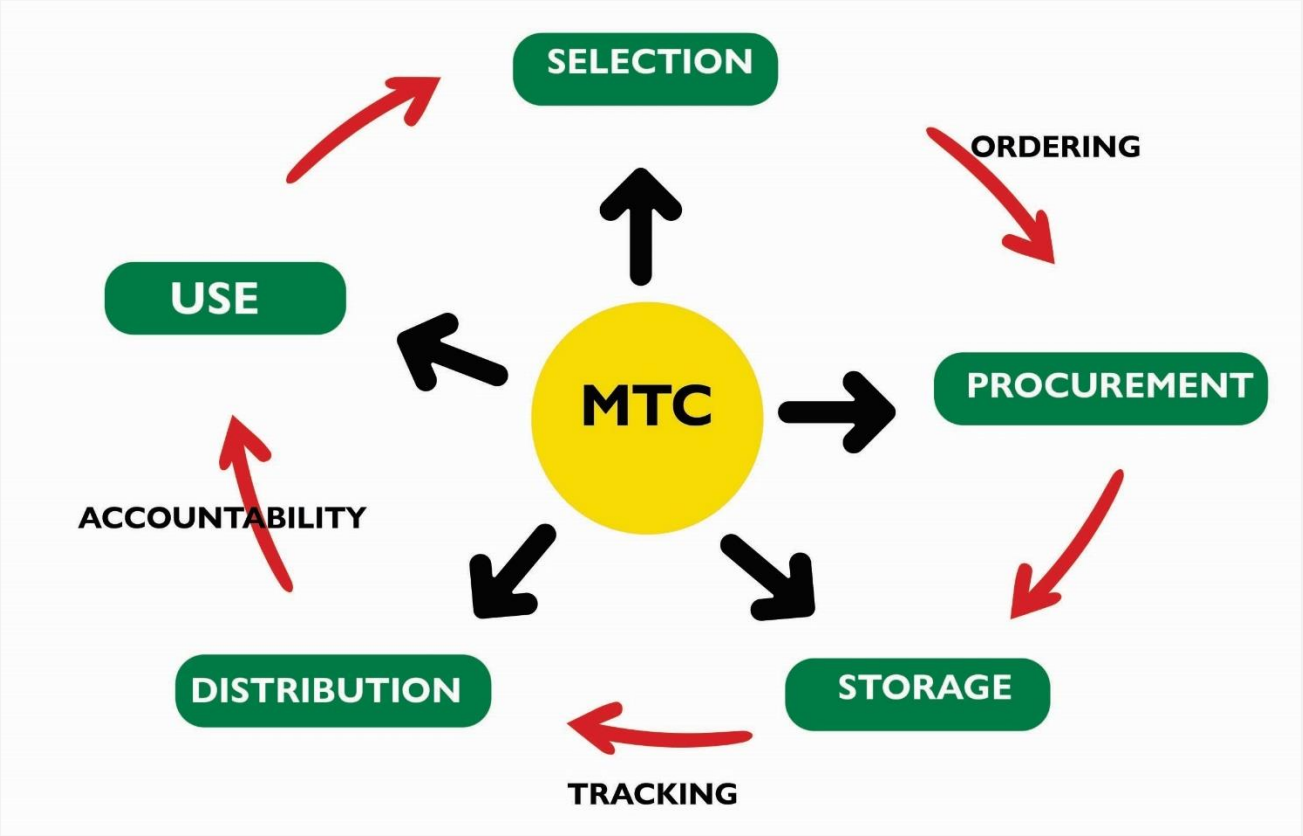


Table 36: Roles and functions of MTC

Role	Function
Evaluating and improving the clinical use of medicines	• Formulate, implement and monitor policies and guidelines for appropriate use of medicines and supplies in the health facility • Develop, implement and monitor the use of standard treatment guidelines • Identify medicine use problems (prescriptions, administration, availability, etc.) • Conduct effective interventions to improve medicine use (educational, managerial, regulatory and financial strategies) • Conduct pharmacovigilance activities: medication errors, adverse drug reactions, treatment failures and causes, drug quality issues • Design and implement antimicrobial stewardship activities • Advise medical, pharmacy and administrative staff on appropriate medicine use • Conduct appropriate research on medicine use

Role	Function
Developing and/or monitoring policies and procedures for management and use of medicines and health supplies	• Regulate and monitor availability, tracking and accountability of pharmaceuticals within the health facility • Analyse, monitor and regulate and expenditures on medicines to ensure cost effective use of resources 5. Develop or adopt/adapt and monitor policies and procedures e.g., Pharmaceutical promotion o Medicine donations o Selection, quantification, procurement planning, storage, distribution and re-distribution, accountability systems o Prescription, dispensing, administration of medicines e.g., restrictions and permissions for different cadres o Expiries and disposal of pharmaceutical products
Developing and managing an institutional medicine list	• Develop criteria for inclusion and exclusion of essential medicines and health supplies onto the institutional medicines list (IML) • Develop institutional medicines list (IML) • Develop a facility-based antibiogram to guide antibiotic selection

24.2. Benefits of a functional MTC

A functional and active MTC will have several benefits:

1. Availability of effective, safe, high-quality, and cost-effective pharmaceuticals
2. Reduction of medicine use problems leading to improved medicine use
3. Improved prevention, control and management of antimicrobial resistance
4. Improved staff knowledge and patient knowledge
5. Decreased Adverse Drug Reactions and medication errors
6. Improved medicine procurement, inventory management and reduced wastage

These will collectively contribute to better quality of services and more cost effective and efficient use of resources.

24.3. Structure and Organization of Medicine and Therapeutics Committee

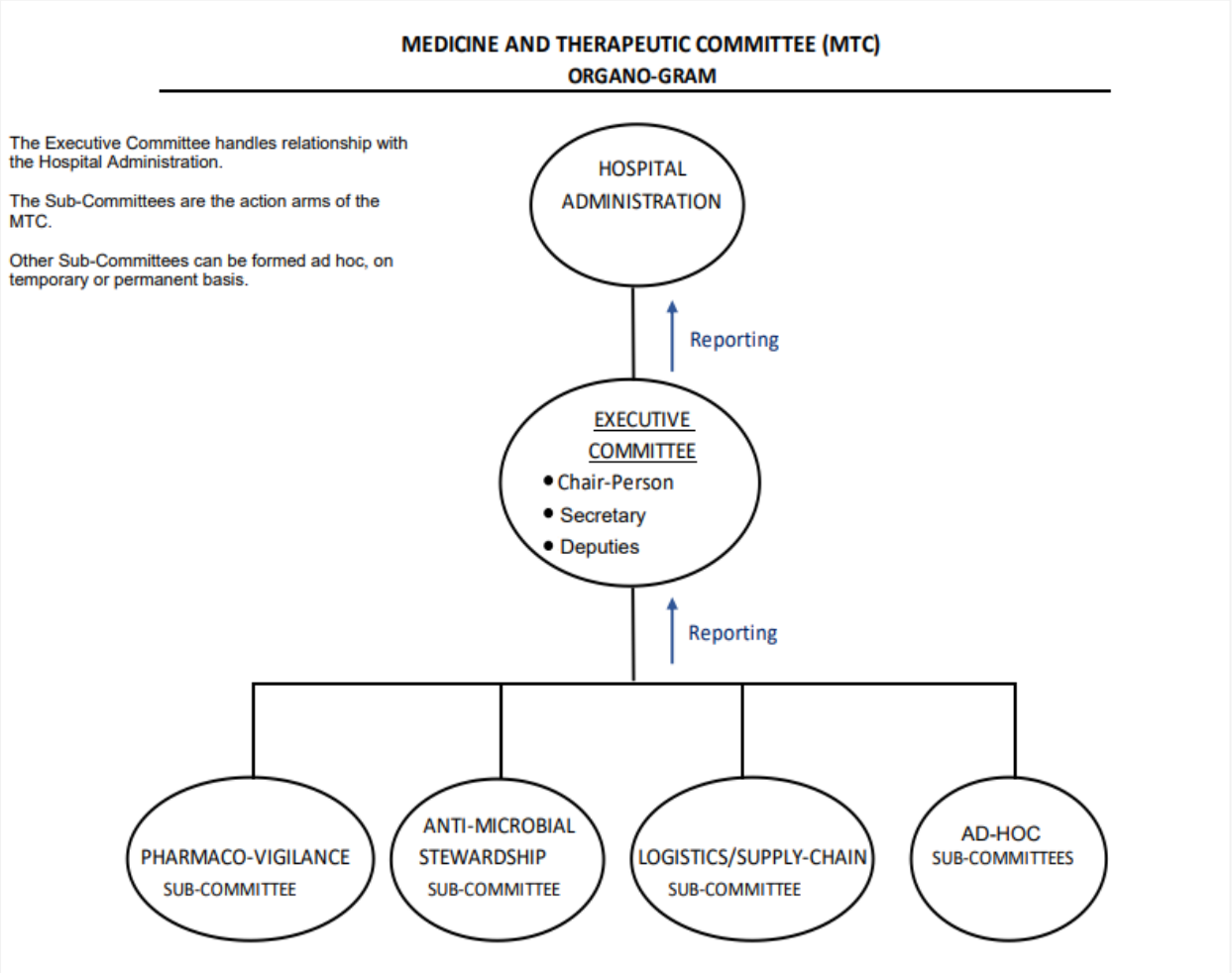
For better function of MTC, it should have a multidisciplinary team, transparent approach, technical competence and an official mandate.

It is essential to define and document:

- The official mandate – MTCs will not work without senior administrative authorization and support
- Roles, responsibilities and functions of the MTC
- The membership of the MTC, including the chairperson and secretary
- Criteria for membership
- How the MTC will operate and report
- The funding sources and incentives
- The relationship of the MTC with other committees (e.g., Infection Control and control [IPC] and Quality Improvement committees) for specific areas of work
- A process for self-assessment and evaluation

A blueprint for Terms of reference for a health facility medicine and therapeutics committee can be found in the MTC manual.

Figure 64: Medicine and Therapeutics Committee organogram



24.4. Principles in setting up the MTC

The following principles should be followed when setting up the MTC:

- **Technical competency:** members will need to bring their expertise and skills and contribute in a constructive manner to the work of the committee.
- **Multidisciplinary approach** sensitive to the local situation: the committee should have a wide representation of cadres and departments.
- Transparency and commitment to good service. The MTC must be active and make sound decisions in a transparent way.
- MTC work should be documented and widely disseminated.
- MTC members should not be influenced by external parties, especially by drug advertisements, promotional activities, or personal financial influences.
- Clear organization of work and division of tasks within the MTC
- Delegation of activities (e.g., research studies, investigations, data collection and analysis, and implementation of MTC activities) to subcommittees.
- Meetings with clear agenda, for discussions and decision making.

24.5. Composition of the MTC

The MTC is usually made up of professionals from all the areas involved in health care:

- Medical and clinical staff, representatives of the major specialties

- Pharmacist/pharmacy technicians (the secretary to the committee)
- Nursing personnel
- Records officers/statistician
- Laboratory
- Stores
- Administration

This mix of personnel would provide all-round input from the diverse segments of the health care facility. Each MTC has the liberty to choose whether to include a community person or co-opt them in the committee or in sub-committees as and when needed. The committee should choose the chairperson. Ideally, a well-known and respected senior member will provide leadership to the committee. The store and pharmacy in-charge must be members, with the head of pharmacy as the secretary and the pharmacy department as the secretariat. It is advisable to appoint a deputy chair and deputy secretary within the committee. The chairperson, secretary, and their deputies will form an **executive committee** to handle administrative tasks.

While generally guidelines indicate heads of departments as the most suitable candidates, this will depend on the local situation: the most important criteria are a technically competent and motivated person with an official mandate. The head of department may select another departmental staff to represent the department. The recommended number of members is 12 to 15; however, this can be adjusted to allow adequate representation and at the same time keep the number manageable. Additional staff can be co-opted in case of specific issues or included in sub-committees.

MTC members are required to sign a declaration of interest, to make sure they do not have any conflict of interest which could affect MTC work.

24.5.1. Subcommittees

The MTC often works through subcommittees, which can be:

1. Standing committees, meaning permanent. Recommended standing committees are:
    1. executive (chairperson, deputy and secretary)
    2. antimicrobial stewardship sub-committee or team
    3. pharmacovigilance sub-committee
    4. supply chain sub-committee
2. Ad hoc committees, created to address specific issues for a specified period of time.

24.6. MTC position within the facility

MTC should be established at **all health care facilities** with the purpose of promoting the appropriate use of medicine and health supplies as part of the strategy aimed at ensuring that end-users receive optimal therapeutic benefits from medicines through scientifically sound and cost-effective use by prescribers, dispensers, and users. The MTC is part and parcel of the continuous quality improvement interventions in the health facilities and is the "Work Improvement Team" for medicines and health supplies. The MTC works in collaboration with the other committees (e.g., infection prevention and control committee) to improve the quality of health services.

24.7. Mode of operation of Medicines and Therapeutics Committees

There are 3 important principles underlying effective MTC work:

1. Leadership:
    a. Strong leadership to ensure that problems are addressed, and solutions are developed and implemented.

    b. Making decisions, completing assigned tasks and following up at the subsequent meetings.
    c. Effective management of meetings: appropriate minute taking and reporting, and follow-up on previous decisions are key.
2. Effective organization of work:
    a. The MTC meeting is the forum scheduled to discuss issues in order to offer solutions.
    b. Sub-committees established to allow division of work among members and make it manageable.
        i. Identify and investigate issues
        ii. prepare reports
        iii. and design and implement intervention methods
3. ***Communication***: Information sharing with health facility staff and management is paramount. The MTC works in a much wider environment and many stakeholders are involved in the process of medicines management and use, and all of them need to be brought on board. Any action, decision, policy change, and even intervention plan should be shared with the rest of the health facility. The choice of communication modalities rest on the MTC itself: memos, general staff meetings, circulars through administration etc.

25. CHAPTER | 25 | RISK MANAGEMENT OF EMHS MANAGEMENT

25.1. Introduction

Risk management is a formal approach used to identify and mitigate the sources of disruption and dysfunction within the public health supply chain.

The rationale for risk management in public health supply chain is to;

- increase the likelihood of achieving the supply chain objectives.
- reduce costs and improve the overall efficiency of the supply chain operations.
- improve the governance and leadership of the supply chain.
- improve public and stakeholder confidence and trust in the supply chain.
- Focus the supply chain manager on proactively managing risk, not only reacting to unforeseen events.

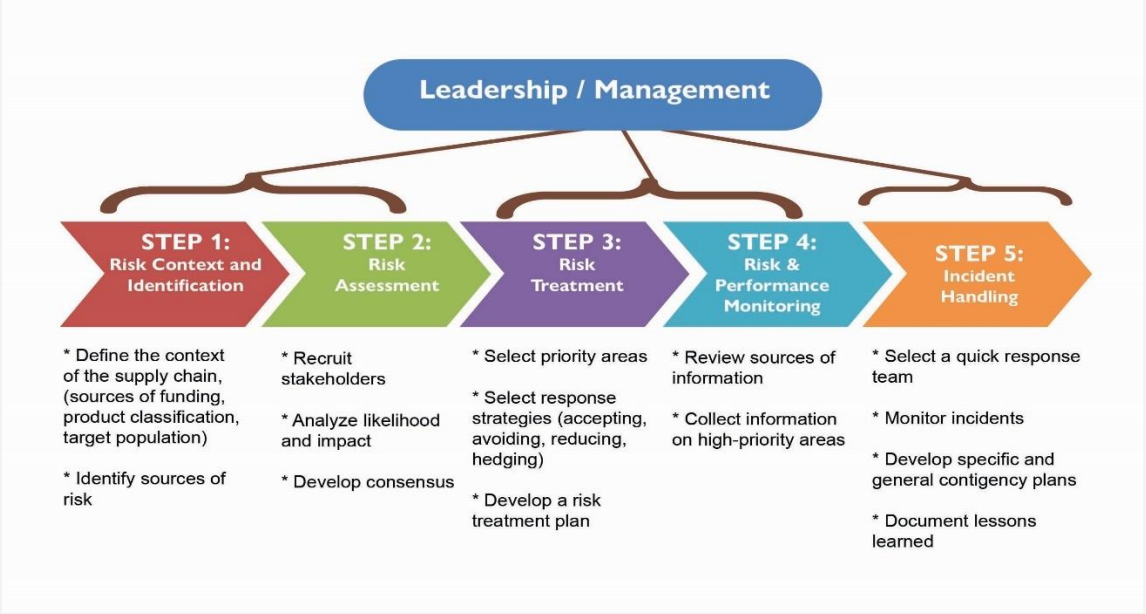
25.2. Risk Management Activities

Table 37: Definition of risk management activities

Risk Management Activity	Definition
Risk context	Mapping supply chain, health, funding, and customer systems
Risk Evaluation	Determining critical features of the risks in the supply chain to inform risk management
Risk mitigation	Determining risk treatment strategy: reducing or avoiding risk, developing contingency plans
Incidence handling	Executing contingency plans
Risk performance monitoring & learning	Monitoring supply chain performance to improve approaches

25.3. Risk Management process

Figure 65: Risk management process



25.4. Risk Identification and Risk Assessment

Risk identification involves identifying and classifying sources of a risk to realize what must be managed. Risk identification is the first step in Risk management process, as the potential problems must be identified before assessment, respond and control of the risk can take place.

Risk assessment is a systematic process of identifying hazards and evaluating any associated risks within a workplace, then implementing reasonable control measures to remove or reduce them.

There are four parts to any good risk assessment, and they are risk identification, Risk Analysis, Risk likelihood & impact, and Cost of intervention.

Risk Evaluation is the process used to compare the estimated risk against the given risk criteria so as to determine the significance of the risk. Managing risks in a health facility starts with a decision to strategically manage risks at facility-wide level.

Risk control is the set of methods by which a facility evaluates potential losses and take action to reduce or eliminate such threats. Risk control also implements proactive changes to reduce risk in these areas.

Examples of tools used in risk management are, the risk register and the risk priority matrix.

25.4.1. The risk register

A risk register is a risk management tool used to collect potential risk events, organize them by risk categories, and assign team members who will address them.

At facilities information is assigned to each risk description in the risk register, the supply chain managers then prioritize those that need to be most carefully monitored and controlled.

Table 38: Risk register

ID	Date raised	Risk description	Likelihood of the risk occurring	Impact if the risk occurs	Severity (Rating based on impact & likelihood)	Owner (Person who will manage the risk)	Mitigating action (Actions to mitigate the risk e.g., reduce the likelihood)	Contingent action (Action to be taken if the risk happens)	Progress on actions	Status	Useful resources
1			Medium	High	High						
2			Low	High	High						
3			Low	Medium	Medium						

After populating the risk register above, this information is used to generate a risk matrix shown below.

Figure 66: Risk matrix

Likelyhood	Consequences				
	Insignificant *Risk is easily mitigated by normal day to day process*	**Minor** *Delays up to 10% of shedule. Additional cost up to 10% of Budget*	**Moderate** *Delays up to 30% of Sched-ule. Additional cost up to 30% of Budget*	**Major** *Delays up to 50% of sched-ule. Additional cost up to 50% of Budget*	**Catastrophic** *Project abandoned*
Certain *>90% chance*	High	High	Extreme	Extreme	Extreme
Likely *50% - 90% chance*	Moderate	High	High	Extreme	Extreme
Moderate *10% - 50% chance*	Low	Moderate	High	Extreme	Extreme
Unlikely *3% - 10% chance*	Low	Low	Moderate	High	Extreme
Rare *<3% chance*	Low	Low	Moderate	High	High

Priority is given to those whose consequences are extreme

25.4.2. Examples of risks in EMHS management

The risks can be identified at any stage of the medicines management cycle.

Stage	Examples of risk encountered
Selection	Using inaccurate data, etc.
Ordering	Unqualified personnel, inadequate training, and mentorship of the staff, etc.
Storage	Unqualified personnel, Insufficient storage space, Theft, rodents, power outages (cold chain), environmental hazards, stockouts, etc.
Distribution (Receipt)	Bad weather conditions, theft, prolonged lead-times, failure to identify discrepancies, etc.
Use (Dispensing)	Dispensing errors, pilferage of medicines, spillages, failure to follow SOPs on dispensing, etc.

Other examples of risk include:

- Risk of fraud
- Risk of fire
- Risk of loss of information
- Risk of qualified staff leaving the facility
- Risk of adverse environmental conditions such as landslides, and floods.

25.5. Risk Treatment

Risk treatment is a procedure to prevent, control, and lessen the impact of risk.

Generally, there are four types of responses to supply chain risk: accepting risk, avoiding risk, reducing risk, and hedging risk.

A health facility may accept supply chain Risks in case there is no practical way to treat the risk at that moment, there is no added value at this time, based on prioritization or the risk will be eliminated due to upcoming improvements in other areas of the supply chain.

Examples of strategies to avoid supply chain risk, redesign the supply chain network, shift the tasks to other parties, e.g., outsourcing transportation e.g., the last mile delivery, address incentive misalignment, select medicines and health commodities with fewer supply chain risks.

Examples of strategies to reduce supply chain risk include: build capacity of local institutions to provide supply chain expertise and training, improve the logistics management information system, and negotiate framework contracts with suppliers of health commodities.

Examples of strategies to hedge supply chain risk include: increase buffer stock in the supply chain, procure redundant suppliers of health commodities and logistics services, reduce order cycle times at the central medical store, share supply chain costs with partners.

25.6. Internal controls

Internal Controls are the integration of the activities, plans, attitudes, policies, and efforts of the people of a health facility working together to provide reasonable assurance that the facility will achieve its mission. These are to make sure the right things happen, and the wrong things don't.

Supplies internal control measures include: periodic monitoring of inventories usage, periodic stock checks, using stock cards to track usage, restricting access to stores or pharmacy to only authorized personnel, no single individual should control all the key aspects of the medicines management cycle, routinely check the integrity of your lock system, installing CCTV cameras, using biometric access, among others.

25.7. Risk Monitoring

The risk monitoring includes identifying, analyzing, planning, and tracking new risks; constantly reviewing existing risks; monitoring trigger conditions for contingency plans; and monitoring residual risks . It also includes reviewing the execution of risk responses while evaluating their effectiveness. Risks can be monitored using routinely collected indicators in the LMIS or using new indicators specifically designed for risk management.

For example, risk of expiry information on stock cards is used to calculate the Average Monthly consumption, which is then used determine the months of stock, and then a decision made on whether to redistribute the health commodity under consideration.

NOTE

It is recommended that each facility constitutes a risk management team, this team can be under the subcommittee of Supply chain by the Medicines and Therapeutics committee.

26. CHAPTER | 26 | MONITORING AND EVALUATION

26.1. Introduction

The Monitoring and evaluation of the implementation of the supply chain management activities under the pharmaceutical sector will support in achieving the objectives of the National Pharmaceutical Service Sector Strategic Plan IV IVII, identify implementation gaps, assess impact of the interventions, and measure the overall status of the NPSSP IVII performance. All these are guided by the indicator reference sheet as well as the monitoring and evaluation plan whose main objective is to:

1. To provide a framework for the collection, processing, reporting, analysis, and use of pharmaceutical sector data in Uganda
2. To provided standard indicators, targets, formats, and frequencies for reporting by all stakeholders.
3. To describe the type of data and data sources, and how data will flow from the primary source to all relevant stakeholders.
4. To guide the routine and periodic documentation of planned activities and measure the expected outputs, outcomes, and impact.
5. To define implementation arrangements with clear responsibilities.

The implementation of the Monitoring and evaluation function under the Ministry of health – Pharmacy department will be led by the PD M&E Unit. The unit will co-ordinate data collection and guide on which data to be collected at different time periods while highlighting the specific data source. Weekly, Bi-monthly, quarterly, and annual data analysis of data for periodic indicator performance and routine pharmaceutical sector report compilation for all pharmaceutical interventions conducted. This will also be conducted to inform work plan development, Supply chain performance as well as change in strategy and policy. The unit will guide on the data flow, stipulate roles of stake holders at national, district and health facility level in relation to the health supply chain

Studies, Baseline, Mid-term, and end line evaluation will be conducted to assess improvement in attaining a good standard of health for Uganda's population through provision of good health care services. This will also assess the attainment of the NPSSP IVII objective of increased access and availability of affordable safe good quality and effective essential medicines and Health supplies that are used appropriately. Data used for monitoring and evaluation will be from the Health Management Information System (HMIS) through District Health Information Software version 2 (DHIS2). The primary HMIS data sources of the supply chain information will include Stock cards, Stock books, Daily dispensing logs, ARV Medicines Order & Patient Report Form, Requisition & Issue Voucher, Bi-monthly Report & Order Calculation Form for HIV Test Kits, Order form for EMHS. Other data sources will include the national stakeholder's data based on Plans, Order, and issues for warehouses (NMS, JMS, MAUL), Stakeholders Annual report like NDA, National Supervision, Performance Assessment and Recognition strategy for ART, EMHS, TB and Laboratory data reported through Pharmaceutical Information Portal. The Supply chain related reporting forms will include HMIS 105 monthly report and HMIS 033B Weekly surveillance report. The electronic information systems like the Rx solution and RAAS among others will also provide data for conducting monitoring and evaluation.

26.2. HMIS 105 Section 6 (monthly)

Stock information (issued, days out of stock, balance, expiries) about 41 tracer commodities currently which will essentially increase to 50 tracer commodities after the HMIS revisions.

Figure 67: Extract of HMIS 105: section 6 report form

HMIS 105: HEALTH UNIT OUTPATIENT MONTHLY REPORT **Page 24**

6.0 ESSENTIAL MEDICINES AND HEALTH SUPPLIES

6.1 STOCK STATUS (Out of stock means that there was NONE left in your health unit STORE)

Note: The primary data sources for this sub-section are the Stock books and Stock Cards

SN.	NAME OF DRUG ITEM	UNIT	Quantity Consumed (units)	Days out of stock	Stock on hand	Quantity expired
SS01	Artemether/Lumefantrine 20/120 mg	Tablet				
SS02	Depot medroxy progesterone acetate (DMPA)	Injectable				
SS03	Amoxicillin 250 mg capsule	Capsule				
SS04	Sulfadoxine/ Pyrimethamine tablet	Tablet				
SS05	ORS Sachets with zinc tablet	Packet				
SS06	Measles Vaccine	Vial				
SS07	Determine HIV 1 & 2 screening test	Tests				
SS08	Stat -pack HIV Confirmatory rapid tests, tests	Tests				
SS09	SD Bioline test Tie-Breaker	Tests				
SS10	CD4 reagent	Tests				
SS11	Malaria Rapid Diagnostic tests	Tests				
SS12	GeneXpert Cartridges	Cartridges				

26.2.1. Definition of terms

Quantity consumed - Issued from store (proxy)

Days out of stock - Days when product was not available

Stock on hand - Stock balance at end of month

26.3. HMIS 033B: Health Unit Weekly Epidemiological Surveillance Report

Figure 68: Extract of HMIS 033B: Section 7 report form

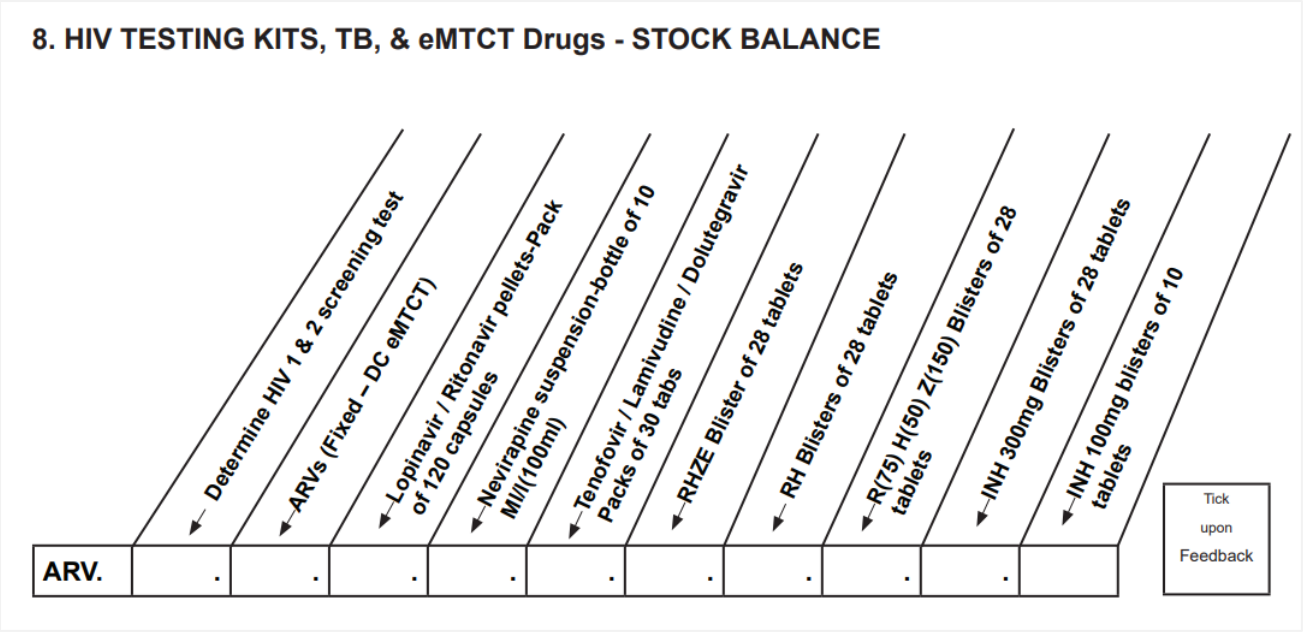
7. TRACER MEDICINES - STOCK BALANCE

	ACT (Tablets)	ORS (Sackets)	Measles Vaccine Doses	Amoxicillin Dispersible 250mg Tablets	Depot medroxy progesterone acetate (DMPA) injectable	IV artesunate 60 mg vials	Fansidar Tablets	RDT (Malaria) Tests	Tick upon Feedback
TRA.	.	.	.	.	.	.	.		

NOTE

The report is similar to HMIS 105 but provides for stock balances ONLY (in absolute numbers)

Figure 69: Extract of HMIS 033B: Section 8 report form



The pharmacy department will disseminate weekly, Bi-monthly, Quarterly and Annual pharmaceutical performance through the digital screen at MOH, Bi-monthly Facility Stock status reports, quarterly reports, annual report, baseline, mid-term, and end line report. The unit will also use MPM TWG, CSG, SMEAR, M&E health commodity meetings and HIS/Data management thematic TWG meetings to disseminate information on health supply chain performance. Publications on Supply chain performance and reports will be posted on the PIP and MOH websites.

The key Supply Chain performance indicators and their reference sheets are in Appendix 1 and Appendix 2. These indicators are extracted from the NPSSP IV which is aligned to the Ministry of Health Strategic plan 2020/21-2024/25.

APPENDIX

Appendix 1: Performance Indicator Table

Below is the Key performance indicators (KPIs) table extracted from the NPSSP IV aligned with the MOH Strategic Plan.

Priority Area	Performance Indicators	Data source	Reporting Frequency
Health commodity Supply Management System.	Percentage availability of a basket of 41 commodities based on all reporting Health Facilities.	HMIS	Monthly
	Percentage of Health Facilities that had over 95% availability of a basket of commodities.	HMIS	Monthly
	Percentage stock-out rate of the tracer commodities (HMIS 105-6).	MoH stock status report	Annual
	Order fill rates from warehouses (NMS, JMS) to facilities (deliveries).	Warehouse Databases	Monthly
Appropriate Medical Product Use	Number of prescription and medicine use audits/Point prevalence surveys conducted at Referral Hospitals.	Reports	Semi-annual
	Proportion of Hospitals and HCIVs with functional MTCs.	Progress Reports	Quarterly
Traditional & Complementary Medicines (TCM)	Proportion of the approved TCM products that have been mainstreamed into the conventional regimens.	Natural Chemotherapeutics Research Institute (NCRI) Reports	Annual
Local manufacture of Health Commodities.	Percentage of locally manufactured products registered with NDA.	NDA reports	Annual
Regional and International Collaboration	Number of dissemination sessions done for pharmaceutical research.	Policy documents	Annual
	Number of Pharmaceutical formulations developed.	Policy documents	Annual
	Number of viable commercial products supported by private sector (pharmaceutical companies) through innovation and translation of identified TCM molecules.	Policy documents, frameworks etc.	Annual
Strengthen the pharmaceutical information management systems to enhance traceability and accountability of EMHS.	Number of health facilities with eLMIS and linked to the pharmaceutical information Portal (PIP).	PIP	Quarterly
	Percentage of facilities with an eLMIS synchronizing/uploading stock status data to PIP.	PIP	Quarterly

Priority Area	Performance Indicators	Data source	Reporting Frequency
	Percentage of eligible Health Facilities using the NMS+ ERP to order essential medicines and health supplies.	NMS ERP	Quarterly
Improve Leadership, governance, and stewardship for pharmaceutical service delivery	Number of Supply Chain coordination mechanism meetings held at Health Facilities and agreed actions implemented.	Reports	Quarterly

Appendix 2: Performance Indicator Reference Sheets (PIRS)

Priority Area: Health commodity Supply Management System
Indicator 1: Percentage availability of a basket of 41 commodities based on all reporting Health Facilities.
Precise Definition: This indicator measures availability of 41 tracer Items at the Health Facilities at the end of each month. Availability is measured as the number of days for which a specific commodity was in stock at the facility store during the reporting period. The commodities are categorized in five baskets a total of 41 commodities.
Numerator: Number of days in the reporting month-Stock out days of an item
Denominator: Total Number of days in the reporting month
Unit of Measure: Count
Disaggregated by: Commodity Categories/Basket
OTHER NOTES
Priority Area: Health commodity Supply Management System
Indicator 2: Percentage of Health Facilities that had over 95% availability of a basket of commodities.
Precise Definition: This indicator measures percentage of Facilities that had over 95% availability of 41 tracer Items at the Health Facilities at the end of each month.
Numerator: Number of Health Facilities with over 95% availability of a basket of Items
Denominator: Total Number of Health Facilities that reported
Unit of Measure: Count
Disaggregated by: Public and PNFP Health Facilities
OTHER NOTES

Priority Area: Health commodity Supply Management System
Indicator 3: Percentage stock-out rate of the tracer commodities (HMIS 105-6).
DESCRIPTION
Precise Definition: It measures the percentage of Health Facilities in the country reporting stock outs of commodities.
Numerator: Number of days in the reporting month-Stock out days of an item
Denominator: Total Number of days in the reporting month
Unit of Measure: Count
Disaggregated by: Commodity Categories/Basket
OTHER NOTES:
Priority Area: Health commodity Supply Management System
Indicator 4: Order fill rates from warehouses (NMS, JMS) to facilities (deliveries).
DESCRIPTION
Precise Definition: The order fill rate simply refers to the percentage of customer orders that are immediately fulfilled by available stock. It is also known as the demand satisfaction rate because customer satisfaction is closely tied to how many orders that can be filled by stock on hand.
Numerator: Customers/facilities orders shipped in full from the warehouses (NMS, JMS)
Denominator: Customers/facilities orders placed with warehouses (NMS, JMS)
Unit of Measure: Count
Disaggregated by: Warehouses
OTHER NOTES:
Priority Area: Appropriate Medical Product Use
Indicator 1: Number of prescription and medicine use audits/Point prevalence surveys conducted at Referral Hospital.
DESCRIPTION
Precise Definition: This indicator measures the percentage of medicine audits/point prevalence surveys conducted at Referral Hospitals in the country.
Numerator: Number of audits done at the Referral Hospitals

Denominator: Total Number of audits planned
Unit of Measure: Count
Disaggregated by: Audits/Surveys
OTHER NOTES:
Priority Area: Appropriate Medical Product Use
Indicator 2: Proportion of Hospitals and HCIVs with functional MTCs.
DESCRIPTION
Precise Definition: This indicator measures availability of 41 tracer Items at the Health Facilities at the end of each month. Availability is measured as the number of days for which a specific commodity was in stock at the facility store during the reporting period. The commodities are categorized in five baskets a total of 41 commodities.
Numerator: Number of days in the reporting month-Stock out days of an item
Denominator: Total Number of days in the reporting month
Unit of Measure: Count
Disaggregated by: Commodity Categories/Basket
OTHER NOTES:
Priority Area: Traditional & Complementary Medicines (TCM)
Indicator 1: Proportion of the approved TCM products that have been mainstreamed into the conventional regimens.
DESCRIPTION
Precise Definition: This indicator measures availability of 41 tracer Items at the Health Facilities at the end of each month. Availability is measured as the number of days for which a specific commodity was in stock at the facility store during the reporting period. The commodities are categorized in five baskets a total of 41 commodities.
Numerator: Number of days in the reporting month-Stock out days of an item
Denominator: Total Number of days in the reporting month
Unit of Measure: Count
Disaggregated by: Commodity Categories/Basket
OTHER NOTES:
Priority Area: Local manufacture of Health Commodities

Indicator 1: Percentage of locally manufactured products registered with NDA.
DESCRIPTION
Precise Definition: This indicator measures availability of 41 tracer Items at the Health Facilities at the end of each month. Availability is measured as the number of days for which a specific commodity was in stock at the facility store during the reporting period. The commodities are categorized in five baskets a total of 41 commodities.
Numerator: Number of days in the reporting month-Stock out days of an item
Denominator: Total Number of days in the reporting month
Unit of Measure: Count
Disaggregated by: Commodity Categories/Basket
OTHER NOTES
Priority Area: Regional and International Collaboration
Indicator 1: Number of dissemination sessions done for pharmaceutical research.
DESCRIPTION
Precise Definition: This indicator measures availability of 41 tracer Items at the Health Facilities at the end of each month. Availability is measured as the number of days for which a specific commodity was in stock at the facility store during the reporting period. The commodities are categorized in five baskets a total of 41 commodities.
Numerator: Number of days in the reporting month-Stock out days of an item
Denominator: Total Number of days in the reporting month
Unit of Measure: Count
Disaggregated by: Commodity Categories/Basket
OTHER NOTES
Priority Area: Regional and International Collaboration
Indicator 2: Number of Pharmaceutical formulations developed.

DESCRIPTION
Precise Definition: This indicator measures availability of 41 tracer Items at the Health Facilities at the end of each month. Availability is measured as the number of days for which a specific commodity was in stock at the facility store during the reporting period. The commodities are categorized in five baskets a total of 41 commodities.
Numerator: Number of days in the reporting month-Stock out days of an item
Denominator: Total Number of days in the reporting month
Unit of Measure: Count
Disaggregated by: Commodity Categories/Basket
OTHER NOTES
Priority Area: Regional and International Collaboration
Indicator 3: Number of viable commercial products supported by the private sector (pharmaceutical companies) through innovation and translation of identified TCM molecules.
DESCRIPTION
Precise Definition: This indicator measures availability of 41 tracer Items at the Health Facilities at the end of each month. Availability is measured as the number of days for which a specific commodity was in stock at the facility store during the reporting period. The commodities are categorized in five baskets a total of 41 commodities.
Numerator: Number of days in the reporting month-Stock out days of an item
Denominator: Total Number of days in the reporting month
Unit of Measure: Count
Disaggregated by: Commodity Categories/Basket
OTHER NOTES
Priority Area: Strengthen the pharmaceutical information management systems to enhance traceability and accountability of EMHS
Indicator 1: Number of health facilities with eLMIS and linked to the pharmaceutical information Portal (PIP).

DESCRIPTION
Precise Definition: This indicator measures availability of 41 tracer Items at the Health Facilities at the end of each month. Availability is measured as the number of days for which a specific commodity was in stock at the facility store during the reporting period. The commodities are categorized in five baskets a total of 41 commodities.
Numerator: Number of days in the reporting month-Stock out days of an item
Denominator: Total Number of days in the reporting month
Unit of Measure: Count
Disaggregated by: Commodity Categories/Basket
OTHER NOTES
Priority Area: Strengthen the pharmaceutical information management systems to enhance traceability and accountability of EMHS
Indicator 2: Percentage of facilities with an eLMIS synchronizing/uploading stock status data to PIP..
DESCRIPTION
Precise Definition: This indicator measures availability of 41 tracer Items at the Health Facilities at the end of each month. Availability is measured as the number of days for which a specific commodity was in stock at the facility store during the reporting period. The commodities are categorized in five baskets a total of 41 commodities.
Numerator: Number of days in the reporting month-Stock out days of an item
Denominator: Total Number of days in the reporting month
Unit of Measure: Count
Disaggregated by: Commodity Categories/Basket
OTHER NOTES
Priority Area: Strengthen the pharmaceutical information management systems to enhance traceability and accountability of EMHS
Indicator 3: Percentage of eligible Health Facilities using the NMS+ ERP to order essential medicines and health supplies.
DESCRIPTION

Precise Definition: This indicator measures availability of 41 tracer Items at the Health Facilities at the end of each month. Availability is measured as the number of days for which a specific commodity was in stock at the facility store during the reporting period. The commodities are categorized in five baskets a total of 41 commodities.
Numerator: Number of days in the reporting month-Stock out days of an item
Denominator: Total Number of days in the reporting month
Unit of Measure: Count
Disaggregated by: Commodity Categories/Basket
OTHER NOTES
Priority Area: Improve Leadership, governance and stewardship for pharmaceutical service delivery
Indicator 1: Number of Supply Chain coordination mechanism meetings held at Health Facilities and agreed actions implemented.
DESCRIPTION
Precise Definition: This indicator measures availability of 41 tracer Items at the Health Facilities at the end of each month. Availability is measured as the number of days for which a specific commodity was in stock at the facility store during the reporting period. The commodities are categorized in five baskets a total of 41 commodities.
Numerator: Number of days in the reporting month-Stock out days of an item
Denominator: Total Number of days in the reporting month
Unit of Measure: Count
Disaggregated by: Commodity Categories/Basket
OTHER NOTES

Appendix 3: Oxygen Supply Chain Management Indicators

Supply Chain stage	Key performance Indicator	Indicator definition	Reporting tool/ Information source	Frequency of reporting	Level
Quantification and procurement planning	Forecasted demand ratio by LoC	**Numerator:** Actual consumption of Oxygen by LoC **Denominator:** Forecasted Oxygen Consumption by LoC	Oxygen Dashboard (DHIS2-HMIS)	Quarterly	National
	Net Oxygen production capacity (Proportion of demand met)	**Numerator:** Actual quantity of Oxygen produced in the review period **Denominator:** Forecasted Oxygen Consumption	Oxygen Dashboard (DHIS2-HMIS)	Bi-Annually	National
Production	Proportion of functional Oxygen plants	**Numerator**: Number of functional Oxygen plants **Denominator**: Number of existing Oxygen plants	Automated Oxygen Production (Plant/Tank) Monitoring System (OPMS)	Monthly	National
	Proportion of Oxygen plants functioning to capacity	**Numerator:** Number of Oxygen plants that have met at least 80% of their cylinder filling target **Denominator:** Number of functional Oxygen plants Cylinder filling target: Number of cylinders that a plant is supposed to fill in a specified period of time	Automated Oxygen Production (Plant/Tank) Monitoring system (OPMS)	Monthly	National
	Average No. of hours the Oxygen plants are operating daily	**Numerator**: Sum of the plants' daily operation hours in the reporting period **Denominator**: Number of days in the reporting period	Automated Oxygen Production (Plant/Tank) Monitoring System (OPMS)	Monthly	Facility
Distribution	Proportion of facilities making Oxygen orders on time (Order submission rate)	**Numerator**: Number of facilities that have made orders in time **Denominator**: Number of facilities that are expected to order	NMS+ CSSP	Bimonthly (2 months)	National
	On-Time and In-Full Delivery of Oxygen (OTIF)	**Numerator**: Number of correct orders fulfilled (full qty) in time (within cycle)	NMS+ CSSP/eLMIS	Bimonthly (2 months)	National

Supply Chain stage	Key performance Indicator	Indicator definition	Reporting tool/ Information source	Frequency of reporting	Level
		Denominator: Number of orders made in the cycle			
	Proportion of functional cylinders available for Oxygen distribution	**Numerator:** Number of functional cylinders in health facilities **Denominator:** Total number of Oxygen cylinders in Use at health facilities	Oxygen Dashboard (DHIS2-HMIS)/CMMS/NOMAD	Quarterly	National
Availability of Oxygen in health facilities	Proportion of facilities with Full Stock Availability of Oxygen & it's consumables	**Numerator:** Number health facilities with no stock out during resupply period for 2 tracer items *(see hypoxemia report, HMIS 105B)* **Denominator:** Total number of health facilities	Oxygen Dashboard (DHIS2-HMIS)	Bimonthly	Regional
	Proportion of facilities Stocked According to Plan with Oxygen & its consumables	**Numerator:** Number of health facilities with MoS equal to/greater than procurement period for 2 tracer items *(see hypoxemia report, HMIS 105B)* **Denominator:** Total number of health facilities	Oxygen Dashboard (DHIS2-HMIS)	Monthly	Regional
Utilization & Quality of Oxygen SCM	Proportion of Hypoxaemic patients given Oxygen therapy	**Numerator**: Number of Hypoxaemic patients given Oxygen therapy **Denominator**: Number of Hypoxaemic patients identified	Oxygen Dashboard (DHIS-HMIS)	Monthly	Facility
	Proportion of facilities achieving the recommended quality of Oxygen management (from OxygenOXYGEN ssessment tool i.e. "SPARS for Oxygen"). *ReOxygen section 6.3 below*	**Numerator**: Number of facilities achieving 80% overall score in Oxygen SCM assessment tool **Denominator**: Total number of facilities assessed/supervised	Pharmaceutical Information Portal (PIP)	Quarterly	Facility

Appendix 4: Rapid Health Facility Oxygen Monitoring Tool

This reporting tool shall be used during times of PHE response to track Oxygen demand and availability and to coordinate Oxygen supply during a PHE response. It can also be used to facilitate data-driven redistribution of Medical Oxygen during ordinary times. It will be hosted on the Oxygen dashboard within the DHIS2.

RAPID HEALTH FACILITY OXYGEN MONITORING TOOL (WEEKLY/DAILY)			
***Purpose**: Facilitate near-realtime monitoring of Oxygen availability in HFs and coorditnation of supply during PHEresponce*			
FACILITY:		**LEVEL OF CARE:**	
RRH ATTACHED:		**DISTRICT:**	
DATE:		**REPORTER (NAME/PHONE):**	
CURRENT REVIEW PERIOD IS?		*NB: Official review period will be communicated from time to time by the MoH*	
PART 1: ALL HEALTH FACILITIES			
Oxygen cylinders consumed (in-facility/transfer-out) in last review period (all sizes)			
Filled Oxygen cylinder stock level			
Availability/functionality of Oxygen concentrators			
Remarks on Oxygen consumption and stock levels			
PART 2: HEALTH FACILITIES WITH PLANTS/TANKS ONLY			
Oxygen cylinders produced (filled) in last review period (all sizes)			
Status of Oxygen plant/tank			
Remarks on Oxygen plant/tank			

Steps in filling the Rapid Health Facility Oxygen Monitoring Tool

- **Responsibility:** Health Facility In charge/Oxygen Focal Person
- **Header Section:** Fill in the general health facility information (i.e. Name, LoC, RRH attached, District, Date, Report and Review period (weekly/daily)
- Part 1: All health facilities; Use stock cards as the data source
- Report on the number of cylinders consumed by the health facility in the review period (week/day)
- Calculate the month of stock on hand and choose as specified in the drop down (Options include: Stocked out (SoH=0), Critically low stock (MoS<=1Mon), Under stocked (MoSbtn1-2Mns), Sufficient stock (MoS>=2Months))
- Choose as specified in the drop down (Options include: All functional, Some (not all) functional, All non-functional, No concentrator in HF)
- Give any useful comments on Oxygen consumption and stock levels
- Part 2: Only applies to health facilities with Oxygen plants/tanks
- Report the number of Oxygen cylinders filled with medical Oxygen documented in the plant production sheet
- Select the functionality status of the Oxygen plant as specified in the drop-down (Options include: All functional, All functional but some/all need service, Some (not all) functional, All not functional)
- Record any useful information that may regarding Oxygen production and the status of the plant/tank

The pharmacy department will disseminate routine pharmaceutical performance through the various manual and digital platforms. The unit will also use MPM TWG, CSG, M&E health commodity meetings and HIS/Data management thematic TWG meetings etc to disseminate information on health supply chain performance. Publications on Supply chain performance and reports will be posted on the PIP and MOH websites.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