

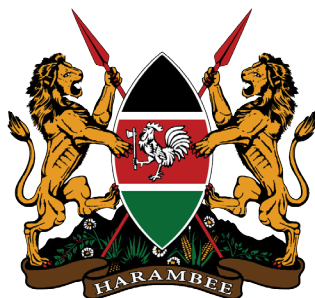


REPUBLIC OF KENYA
MINISTRY OF HEALTH

QUANTIFICATION HANDBOOK FOR HEALTH PRODUCTS AND TECHNOLOGIES

OCTOBER 2020





REPUBLIC OF KENYA
MINISTRY OF HEALTH

Quantification Handbook for Health Products and Technologies October 2020

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FOREWORD



The Ministry of Health is keen to ensure provision of quality preventive, promotive and curative services to the lowest level of care. This requires strong, efficient and effective health care systems that ensure adequate availability of quality, safe and efficacious health commodities. Universal healthcare coverage is one of the focus areas in the next five years under the “Big Four” agenda of the Government of Kenya. Kenya aspires to have Universal Health Coverage (UHC) by the year 2022. UHC cannot be achieved without access to essential health products and technologies. Therefore, strengthening of the supply chain management systems is a key initiative to ensure realization of UHC.

Health commodities in all health institutions constitute a large percentage of the budgetary allocation. However, many health facilities either experience shortages for these health commodities or incur substantial losses as a result of overstocking. A number of factors contribute to this occurrence, key among them is sub-optimal forecast of the health product requirement, a supply plan not aligned to demand, inefficient or delayed procurement, and weak in-country stock level monitoring. Additionally, the push supply systems, unreliable consumption and morbidity data, and lack of necessary knowledge, skills and tools at all levels of health care contribute to weak health product supply chain management both at national and peripheral levels.

The Ministry of Health has adopted the shift from the wasteful push supply system to the cost-effective demand-driven pull system so as to improve access to health commodities particularly in the public health facilities. Successful implementation of the pull system is dependent on proper determination of health product requirements at all levels of care so that available resources are utilized well and required health commodities are available in the required quantities. While this process may be tedious and time-consuming, it produces tangible gains.

This handbook has been designed to ease this process and is informative, educative and simple to use. It is our hope that it will assist health care providers to understand the quantification process and correctly apply the simple, systematically presented steps. If utilized as intended, this handbook will contribute to ensuring reliable access to adequate medical supplies in our health facilities.

A handwritten signature in black ink, appearing to read 'Patrick Amoth'.

Dr. Patrick Amoth, EBS
Ag Director General for Health
MINISTRY OF HEALTH

ACKNOWLEDGEMENT

The Ministry of Health and in particular the Division of Health Products and Technologies (DHPT) wishes to acknowledge the support and contribution made by various stakeholders towards the development of this handbook. The development of this handbook was made possible through the funding and technical support from USAID through Afya Ugavi.

Finally, we acknowledge the invaluable inputs of all experts drawn from the Government and other stakeholders. We also recognize the contribution of the reviewers who took their valuable time to review and edit the content of this handbook to ensure it is comprehensive and meets the desired standards.

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ABBREVIATIONS & ACRONYMS

AIDS	Acquired Immunodeficiency Syndrome
AMC	Average Monthly Consumption
CECM	County Executive Committee Member
CHMT	County Health Management Team
COH	Chief Officer of Health
CSTWG	Commodity Security Technical Working Group
DHPT	Division of Health Products and Technologies
HIV	Human Immunodeficiency Virus
HMIS	Health Management Information Systems
HPT	Health Products and Technologies
KEML	Kenya Essential Medicines List
KEMSA	Kenya Medical Supplies Authority
LMIS	Logistics Management Information System
MEDS	Mission for Essential Drugs and Supplies
MOH	Ministry of Health
MOS	Months of Stock
TB	Tuberculosis
TWG	Technical Working Group
USAID	United States Agency for International Development
VEN	Vital, Essential, Non-Essential
WHO	World Health Organization

SECTION 1: BACKGROUND



1.1 INTRODUCTION

Effective health services are highly dependent on the constant availability of required health commodities. The management of health commodities involves four basic functions: selection, procurement, distribution, and use which follow in a cycle.

Quantifying requirements of health commodities is the first step in the procurement process, which aims at ensuring the constant availability of the right health commodities in the right quantities, at reasonable prices and with the required quality.

Quantification is the process of estimating the quantities and costs of the products required for a specific health program (or service) and determining when the products should be delivered to ensure an uninterrupted supply for the program.

Quantification considers the expected demand for commodities, unit costs, existing stocks, stock already on order, expiries, lead time, minimum and maximum stock levels, and shipping costs. Using this information, the total health product requirements and costs for the program can be calculated and compared with the available financial resources to determine the quantities to procure. Quantification includes forecasting and supply planning.

Forecasting is the process of estimating the quantities of products that will actually be dispensed or used to meet the health needs of the targeted population during a specific future period of time. Forecasting can be based on historical consumption (quantities dispensed or used), services, morbidity and/or demographic data, and assumptions about future demand, program plans, and performance. When historical data are unavailable or unreliable, assumptions will also be needed to estimate program performance and product consumption.

Supply planning involves determining the total product quantities and costs required to fill the supply pipeline to ensure optimal procurement and delivery schedules, taking into account forecasted consumption, minimum and maximum stock levels, order and shipping lead times, and desired arrival dates of shipments.

1.2. CURRENT CONTEXT AND POLICY ENVIRONMENT

1.2.1. The Health Products and Technologies Cycle

A successful supply chain provides continuous supply of effective health products. This is only achievable when a country generates accurate forecasts of health product requirements, procures according to plan and monitors in-country stocks to avert shortages. The relationship of these processes is drawn in the Health Products Management Cycle that has 5 fundamental elements that underpin supply chain activities; product selection, procurement, distribution, use and management support.

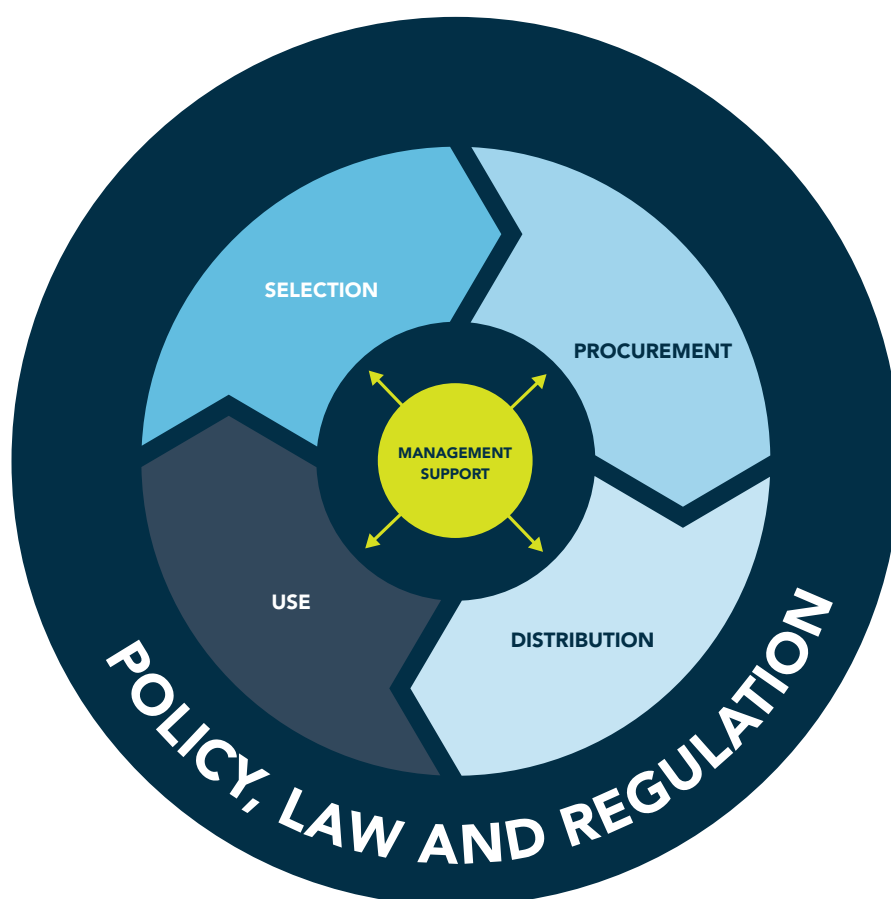


Figure 1 | The Health Products Management Cycle

(Source: Adapted from MDS-3-Managing Access to Medicines and Health Technologies.
Arlington, VA: Management Sciences for Health)

1.2.1.1. The Basic Elements of Health Products Management

Selection

This is the process of identifying which health products should be made available at the facility based on the prevailing local health problems and needs, and the available competence and experience of the health providers. Careful selection is necessary because resources for procurement of health products are usually limited hence the need to use them appropriately. In addition, there is a large variety of health products on the market.

For public facilities selection of items to be quantified is normally based on a standard (preselected) current essential health product lists: the Kenya Essential Medicine List, the Kenya Essential Medical Supplies List and the Kenya Essential Diagnostics List.

Procurement

This is the process of obtaining health products that have been selected. Quantification is the first activity in this phase. It involves determining the quantity of each health product required (Forecasting), developing a supply plan and then obtaining the through purchase or donations.

Quantification is the first activity within the elements of procurement. Once the health products are selected, requirements are forecasted for a specified period and a supply plan generated. Supply planning is the last process in quantification that outlines when the health products should be delivered, and which informs procurement.

Distribution

This is the process of transferring/transporting commodities from one point to another, either within the same facility or from one facility to another. The primary goal of distribution is to efficiently deliver the procured health products to their point of use.

Use

Health products are intended for diagnosis, treatment and management of various health conditions. According to WHO (1985), the rational use of medicines requires that patients receive medications appropriate to their clinical needs in the right doses that meet their individual requirements for an adequate period of time and at the lowest cost possible. The same general principles can be applied to other types of health products.

Management Support

Management Support enables each of the components of the health products management cycle to function well. This entails sufficient financing, adequate training and supervision of staff and maintenance of good records to provide accurate and reliable data for decision making. Additional components of management support include Logistics Management Information System (LMIS), pipeline monitoring, organization and staffing, budgeting, supervision and evaluation. Quality assurance is part of each and every function in the entire cycle.

Policy, Law and Regulations

The entire framework policies, laws, regulations. Many country governments have established policies on the selection of medical products (usually based on essential medicine lists), how items are procured (for example, international competitive bidding or using prequalified manufacturers); when items are distributed; where and how items are stored; and the quantities customers receive (often called dispensing protocols). Fiscal and budget policies are often some of the most influential policies affecting a logistics system, whether related to securing funding for product procurement; or to pay for critical infrastructure, such as storerooms and transportation. Health program managers and other personnel dedicated to logistics can influence these policies, but they may face great challenges when trying to implement or change them. These managers and personnel should stay up-to date on current policies and complete them, as specified.

1.3. GUIDELINES SCOPE AND USE

1.3.1. Goal of this handbook

The goal of this handbook is to standardize, document and institutionalize the processes for quantification of health products in the country. This handbook is designed to assist users in applying a systematic, step-by-step approach to quantifying health products requirements and costs. It should be used when conducting a national or county-level quantification exercise and includes specific guidance on how to use the results of the quantification to do the following:

- Identify the funding needs and gaps for procuring the required commodities
- Coordinate procurements and shipment delivery schedules to ensure a sustained and effective supply of commodities
- Implement a process for reviewing and updating the results of the quantification to maintain and improve the validity, accuracy, and usefulness of current and future quantifications

The step-by-step approach to quantification of health products presented in this guide will enable users to:

- List the specific data required at each step of the quantification
- Collect and analyze the available data
- Identify and obtain consensus on the forecasting assumptions needed to account for missing data and to estimate the effect of stock outs and environmental factors expected to influence the demand for health products
- Organize forecasting data and assumptions
- Utilize the forecasting data and assumptions to calculate the quantity of each product expected to be dispensed or consumed during each year of the quantification
- Identify the key supply chain parameters required to estimate the total health product requirements and costs for the county or country
- Calculate the total health product requirements and costs for each year of the quantification
- Plan shipment quantities and delivery schedules to ensure continuous supply for each year of the quantification
- Compare the amounts and timing of funding commitments for procurement with the total health product costs and required shipment delivery dates as the final step in the quantification
- Monitor the supply plan
- Review and update the results of the quantification to maintain and improve the validity, accuracy, and usefulness of current and future quantifications

1.3.2. Scope of the handbook

The handbook covers the following quantification steps:

- Planning / preparation for quantification
- Forecasting
- Supply planning

1.3.3. Commodities covered by the handbook

Health products and technologies can be categorized as follows:

- Essential HPTs – Pharmaceuticals, medical supplies, laboratory supplies, dental products, radiology supplies
- Strategic HPTs – medicines for TB, HIV & AIDS, malaria and epidemics; vaccines, nutrition products and contraceptives
- Specialized HPTs – cancer medicines, immunosuppressive agents

For strategic health products further reference should be made to program specific handbooks and guidelines that are in place.

1.3.4. Levels of application of the Handbook

The DHPT has the mandate to develop policies, guidelines and handbooks that guide the management of HPTs. This handbook will be applicable at national and county levels in line with their respective operational needs. The handbook will be used by National and County teams involved in quantification, procurement and pipeline monitoring for health products.

1.3.5. Review of the Handbook

To ensure that this handbook is relevant and aligned to current practice and processes, it will be reviewed and updated after every two years. The Head of the DHPT will initiate the review process and coordinate compilation / dissemination of the updated handbook

SECTION 2:

QUANTIFICATION



2.1 IMPORTANCE OF QUANTIFICATION

Quantification is a critical process in ensuring health product security. Through it, the country or county generates timely forecasts for health product requirements, determine financial needs and generate a supply plan that will inform the procurement process. Additionally, quantification results are used to advocate for resource mobilization at county and national levels, help maximize use of available resources and inform manufacturer production cycles and supplier shipment schedules. An estimate of health product requirements (costs and quantities) that is too high could cause excess holding costs, storage capacity strain, and increased risk of product expiries. Overestimating also has an opportunity cost where limited resources are not used where they are required. On the other hand, a low estimate puts a country at a risk of stock-outs and therefore hampers service provision.

Successful quantification requires adequate preparation, access to good data and a team to lead the process and coordinate key stakeholders. Forecasting is followed by supply planning which then informs procurement.

2.2 THE PROCESS OF QUANTIFICATION

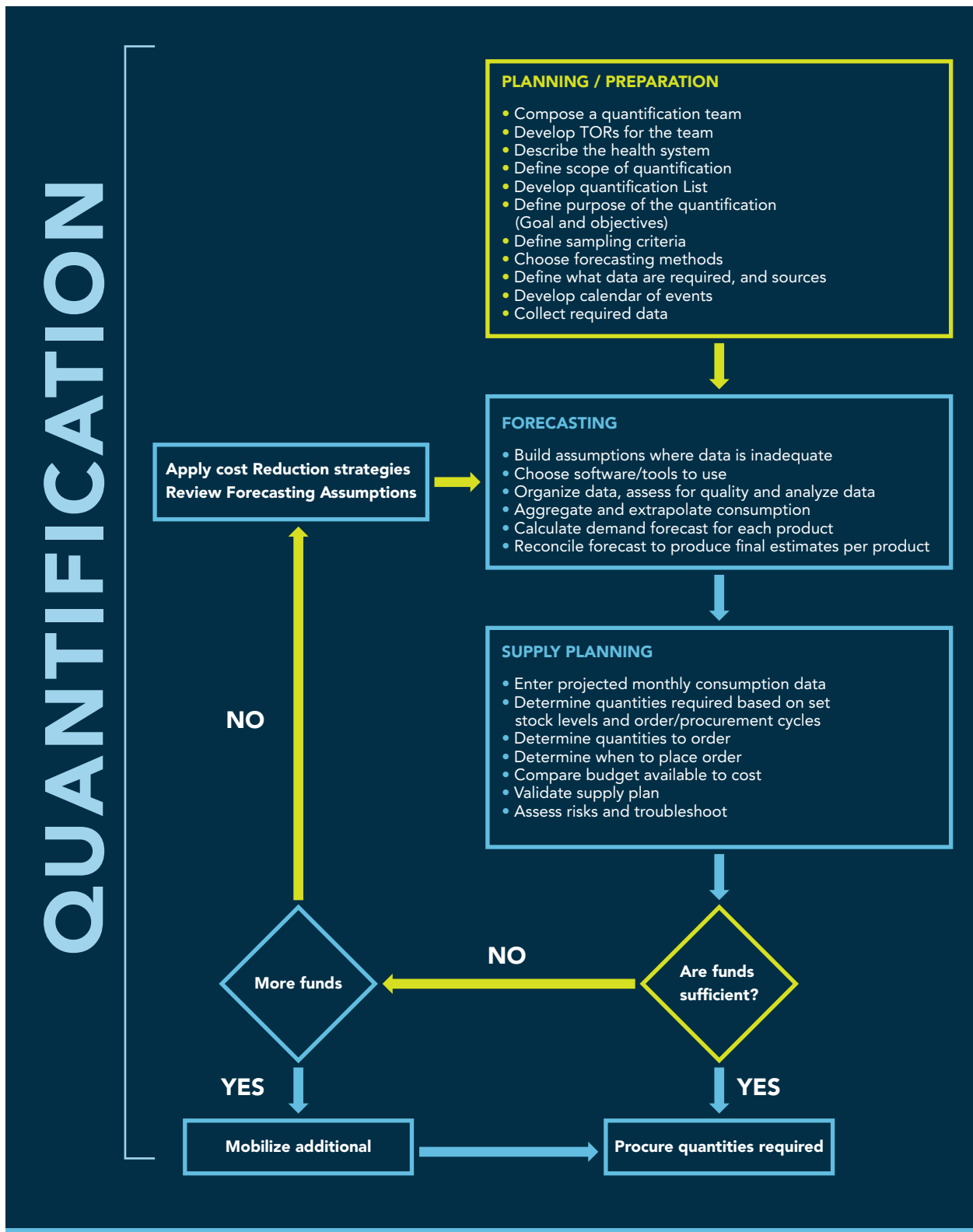
Quantification process entails several related steps that must be well coordinated and executed sequentially, starting with formation of the quantification team, through data collection and validation, to forecasting and supply planning as shown in figure 2 below.

2.3 PLANNING/PREPARING FOR QUANTIFICATION OF BASIC/ESSENTIAL HEALTH PRODUCTS

2.3.1 Compose Quantification Team

For a quantification exercise to be useful and effective, the right people need to be involved in each step of the process, from data collection and analysis to presenting the results to County Health Departments, the Ministry of Health (MOH) and other relevant authorities. Health product managers, county service coordinators, policymakers, program managers, technical experts, procurement officers, warehouse managers, and service providers are the people most often involved in quantification. The policies determining the selection and use of the products being quantified are also specific to each type of service, and type of health product being used. Therefore, it is important to consult with dental, pharmacy, clinical, laboratory, nursing, radiology and physiotherapy and occupational therapy staff who are closely involved in providing these services and managing the products throughout the quantification process.

To coordinate the quantification process, a multi-disciplinary quantification team should be established. The quantification team consisting of members with various sets of skills and expertise that will carry out the estimation of annual requirements and generate a supply plan is appointed by the CS TWG at county level or the HPT TWG at the national level. Table 1 below shows suggested memberships of TWGs at various levels of the health system.



KEY:

PROCESS



Figure 2 | Steps in Quantification Process

Source: Adapted from Quantification of Health commodities: USAID/DELIVER project, Task Order 1. 2008

SECTION 2

Table 1 | Suggested memberships of TWGs at various levels of the health system.

Suggested membership of County Level Quantification Teams	Suggested membership of National Level Quantification Teams
• County Pharmacist • Sub-County Pharmacists • County/Sub-County medical laboratory technologist • County/Sub-County nursing officer • Supply chain management officer • County/Sub-County Nutritionist • County/Sub-County dentist/oral health officer • Physiotherapist/occupational therapist/orthopedic technologist • County/Sub-County Radiographer • County/Sub-County Health Records Information Officer • Supply Chain Implementing partners • KEMSA representative • Other ad hoc members to be identified by the CS TWG	• DHPT representatives from the following technical areas • Clinical • Laboratory • Dental • Nursing • Nutrition • Occupational therapy • Orthopedic Trauma • Physiotherapy • Radiology • Supply Chain Implementing partners • KEMSA representative • Other ad hoc members to be identified by the HPT TWG

One or more members of the quantification team should have significant Excel® / database software management skills to structure the quantification database(s), enter the forecasting and supply planning data and assumptions into the Excel template or database, calculate the final drug quantities and costs, and plan the required shipment quantities and schedules to meet the total county or country requirements.

Depending on the capacity of the team members, a training on quantification is necessary to ensure the quantification team has the required technical capabilities to perform the activities.

The teams should have clear terms of reference (Annexes 1 and 3) and work plan (Annexes 2 and 4). The teams should carry out an annual quantification and meet quarterly at county level and mid-year (6month) at national level to review the quantification assumptions, forecasts and supply plans.

2.3.2 Determine Quantification Scope

The quantification team should define and communicate to CS TWG or the HPT TWG at the national level on the scope of the activity which covers three key areas:

- The objectives of quantification
- The product list - informed by the county needs and clinical guidelines.
- The period to be covered by the quantification.

2.3.3 Develop Quantification List

As mentioned in section 12.1.1, selection of items to be quantified should be based on a standard (preselected) current essential health product lists: the Kenya Essential Medicine List, the Kenya Essential Medical Supplies List and the Kenya Essential Diagnostics List. County Medicines and Therapeutic committees (MTCs) are encouraged to develop formularies informed by the unique disease patterns in the county, services delivered and the level of clinical skills available in the county.

2.3.4 Define Purpose of Quantification

It is important to identify the purpose of the quantification and how it will support the delivery of health services. Examples of quantification purposes include the following:

- Provide data on requirements of health products and costs for the government's annual budget allocations
- Inform donors about funding requirements and advocate for resource mobilization for commodity procurement
- Estimate commodity needs and assess stock status of the in-country supply pipeline to identify and correct supply imbalances
- Support an estimate of commodity procurement, storage, and distribution costs

2.3.5 Determine Quantification Method

The consumption-based method is preferred for the quantification of basic/essential health products. This method makes the following assumptions:

- That current usage patterns will continue
- The system must have relatively uninterrupted supply and a full supply pipeline
- Availability of quality consumption/issues data

2.3.6 Sampling

It is not feasible to collect quantification data from all health facilities because of logistical constraints including transport, time and budget. Therefore, quantification teams should plan to collect from a sample of facilities. Decisions to be made in sampling include sampling frame and sampling strategy.

For most quantifications carried out in Kenya, the sampling frame covers all public facilities in the respective counties. Sampling is done using a stratified purposeful strategy, wherein facilities are stratified by sub-county and by level of care (Level 2, Level 3, Level 4 and Level 5). Level 2 (dispensaries) and 3 (health centers) facilities are further stratified into high volume and low volume. The basis for categorization into low or high volume is based on outpatient workload over the previous 12 months and the variety of services offered. based on facility. Table 2 below illustrates a sample size for a county with four sub-counties.

Table 2 | Illustrative Quantification Sample

Sub-County	County Referral Hospital	Sub-County Hospital	Low Volume Health Centre	Low Volume Dispensary	High Volume health Centre	High Volume Dispensary	Total
SC1	1	1	1	1	1	1	6
SC2		1	1	1	1	1	5
SC3		1	1	1	1	1	5
SC3		1	1	1	1	1	5
County							21

2.3.7 Make quantification plan

The quantification exercise requires early planning. The future time period covered in a quantification exercise needs to be long enough to facilitate timely procurement, identification of funding gaps, and adjustment of shipment schedules, while acknowledging that uncertainty of forecasts increases with the time horizon into the future.

The quantification team should formulate a clear action plan which details processes to be undertaken for successful quantification and specifically addressing the following key aspects:

- Date(s) for quantification
- Workshop logistics
- Tasks to be done, their timelines and deliverables.
- Assigning of tasks and roles

The action plan templates for the national and county levels are provided in Annexes 2 and 4 respectively.

2.3.8 Data Collection

The importance of availability and quality of data cannot be underestimated. A reliable quantification requires accurate, up-to-date, and complete data. These data include services data on the number and type of health services being provided and logistics data on the consumption and stock levels of health products for informing the quantification. A well-functioning health management information system (HMIS) and logistics management information system (LMIS) are critical to ensure the accuracy and usefulness of the quantification process.

Different types of data and information will be required at each step in the quantification. The data types required relate to pack size/unit of issue, consumption/issues, number of days out of stock, wastage (Including expiries, damages and pilferage), stock on hand, unit price and funding for the various commodities. These data types and sources are defined in Table 4 below.

Table 4 | Data types and sources relevant to County Level Quantification

Health product Data type	Description	Source
Product Prices	The cost of each health product	KEMSA MEDS, Other suppliers
Issues*	Month by month data on commodities issued for a minimum of three consecutive months.	Bin Cards, S12, S13, DARs
Stock out data	Health product stock out either at facility level. Including number of days stocked out	Bin Cards, Service reports
Stock on hand*	Physical count for all the products in the quantification list at the ended month preceding quantification	Bin Cards

Health product Data type	Description	Source
Pending procurement	Procurements for which order has been placed but delivery is pending	Procurement Office / Service Coordinators / County Pharmacists
Planned procurement	Planned, but order processing has not started.	Procurement Office / Service Coordinators / County Pharmacists
Funding data	Committed versus actual funding	County Treasury, County Director of Health
Previous year	Necessary to compute forecast accuracy	Previous quantification report
Forecast		
Procurement lead times	Time from planning to order to receipt of commodities influences pipeline parameters	Procurement Office/Service Coordinators / County Pharmacists

Notes:

*Issues should not include:

- Issues to other facilities/Units
- Damages
- Expiries
- Pilferage

*Stock on hand should not include items with remaining shelf life of six months or less

2.3.9 Data Quality Assurance

To ensure quality of data to be used in forecasting requirements, appropriate quality assurance measures should be put in place. Examples of quality checks and procedures that can be used to increase the quality of data collected include:

- Using pre-printed standardized tools to collect data and restricting any additions to the tools.
- Training all persons involved in data collection on quantification and how to use the data collection tools.
- Preparing detailed instructions on how to collect and capture data
- Supervision of data collection by sub-county commodity coordinators.
- Carrying out random checks on source documents to verify the accuracy of data captured.

2.3.10 Pre-quantification checklist

The quantification preparation stage is very critical to a successful forecast. The quantification team can use a simple checklist to ensure the process has been done right (Table 3)

Table 4 | Sample Pre-quantification preparation checklist

Quantification Preparation Checklist

Quantification logistics

- Are the quantification team/ stakeholders invited?
- Is quantification workshop dates, venue and funding confirmed?

Quantification tools and models

- Are the tools for forecasting and supply planning available and updated?

Data:

- Is there data on past consumption and service utilization?
- Is the data complete and accurate?

Stock status and Procurement arrangements

- Is there data on stock on hand?
- Who does procurement for MOH and donors? Is a procurement agency used?
- Is there information on the different lead times?
- Where are the procured commodities received and warehoused?
- Who supplies/ distributes procured commodities?
- Is there data on procurement, warehousing and distribution?
- Is there data on pending and planned procurements?

2.4 Forecasting

Forecasting is the process of estimating the quantities of products that will be dispensed or used to meet the health needs of the targeted population during a specific future period of time. Forecasts can be prepared based on historical consumption (quantities dispensed or used), services, morbidity and/or demographic data, and assumptions about future demand, program plans, and performance – these types of data are described in the preceding section.

2.4.1 Quantification Assumptions

When historical data are unavailable or unreliable, assumptions will also be needed to estimate essential health services performance and product consumption.

Quantifications assumptions refer to the key considerations which influence the entire forecasting besides simulating scenarios relevant to the quantification process. They also provide tenets for accounting for any adjustments done to improve data quality and validity. The quantification team is required to define and document all the assumptions made (Table 5).

FORECASTING

- Organize, analyze, and adjust data
- Build forecasting assumptions
- Calculate forecasted consumption for each product
- Reconcile forecasts to produce a final estimate for each product

Table 5 | Quantification Assumptions

Focus Area of Assumption	Rationale / Importance
Forecasting Assumptions	
Applicable forecasting method	The method to be applied will be consumption based with proxy consumption and service level extrapolation concepts incorporated. This is the most feasible method when quantifying for a large number of commodities. It is assumed that supply of health products to facilities is relatively stable therefore, consumption closely matches demand
Data Quality, Missing Data, New facilities and Newly established services	When data are missing or are of questionable quality (unreliable, outdated, or incomplete), the quantification team will need to formulate assumptions on current service performance. For unreliable data, alternative sources should be sought whereas for outdated data, a factor to estimate current position should be agreed on. This is required to align the data to any increase or decrease in demand for services and commodities. This will be used to forecast quantities of each product that will be needed during each year of the quantification Triangulation supports validation such as for service versus logistics data When quantifying requirements for new facilities, it is advisable to utilize data from low catchment facilities of the same level of care when quantifying. Newly established services can be treated along the same principles
Data for forecasting	A common assumption is that consumption in facilities will remain unchanged for the period covered by the forecast. A related assumption is that consumption patterns are a true reflection of demand and prescription practices are rational. Requirements for some health centers and dispensaries can be extrapolated based on data from the sampled facilities. Whereas extrapolation may be accepted for dispensaries and health centers, hospitals tend to be fewer though with significant impact on budgets and it is advisable to collect data from each to accommodate any unique consumption patterns for that level. Where a facility does not have consumption data for some health products, yet they should be quantified for, it may apply representative data from another comparable facility and adjust the consumption in line with its workload. Teams should avoid collecting consumption data from periods where facilities may have experienced effects of industrial action (strikes). Teams also need to make assumptions concerning rapid results initiatives e.g. that data from such activities is not a reflection of routine demand. Assumptions should also address geographical variation in incidence of specific diseases/ health conditions and consider the effect of staff annual and other leave of absence on reported consumption.

SECTION 2

Focus Area of Assumption	Rationale / Importance
Forecasting Assumptions	
Environmental Factors	The quantification team should develop necessary assumptions taking into consideration the following among other factors that may skew demand: • seasonal consumption variations e.g. due to disease outbreaks, weather changes, • national program policies e.g. free services, strategies e.g. for increasing service uptake and expansion plans • Population growth • Product marketing campaigns which may affect prescription patterns • Rapid Results Initiatives which may increase consumption
Supply Planning Assumptions	
Prices for Health Products	Quantification teams should agree on prices to be used. An underlying assumption related to this is the likely supplier of health products e.g. it may be agreed that KEMSA prices will be used during the supply planning process. In the absence of such prices, other sources can be referenced. Inflation and other economic indicators are usually assumed to remain largely unchanged hence avoiding price adjustment within the period covered by the quantification
Buffer	The buffer stock to be built into the supply plan should be agreed on. Typically, in a system where resupply is quarterly a 3-month buffer tends to be adequate.
Financing	There is a need to assume that amounts and timing of financing available for health product procurement will be fixed or as projected because this affects implementation of the supply plan.

2.4.2 Determine and Prepare quantification models

The quantification team should review the last quantification tools, methodology, report and identify any changes needed to improve them. The team should also consider any other new tools before determining what to use. In this section hypothetical examples have been used where appropriate to illustrate further the processes involved in each step of quantification.

A screenshot of a tested and validated excel based tool that has been extensively used in quantification at both national and county level is provided in Annex 6. Considering the vast amount of data collected during quantification, teams are encouraged to use excel based or other automated tools to increase the accuracy and efficiency of the process.

2.4.3 Calculate Forecasted Consumption for Each Product

Methods for calculating forecasted consumption using consumption or services data include trend projection, regression, moving average, and various more sophisticated statistical approaches. Forecasts are by definition estimates; in predicting the future, there will always be some error.

Thus, the quantification team should not be preoccupied with overly precise estimates. In addition, forecasts are more accurate in aggregate. For instance, generating forecast estimates by county will by and large be less accurate than an aggregated national forecast. Similarly, monthly or quarterly forecasts are likely to be less accurate, on the whole, than annual ones. Forecast error also increases the further into the future the prediction. Routine monitoring and updating of forecasts and supply plans, following a maximum-minimum inventory control system, and reviewing forecast accuracy are strategies that help country programs to minimize the impact of forecast error.

FORECASTING METHODOLOGIES

Forecasting methodologies include the following:

- Consumption method
- Demographic/population method
- Morbidity method
- Proxy consumption method
- Using services data for quantification

Consumption method

The consumption method uses accurate inventory records of past consumption of health products to estimate future requirements. The method is commonly used to forecast for essential health products that are stable in terms of utilization.

Sources of data on consumption and lead time:

- Stock records and distribution reports from a central distribution point/warehouse
- Invoices from suppliers
- Dispensing records in facilities - registers, stock control cards

Examples of data required to use the method:

- Consumption/issues data for a recent period of 6 -12 months. The consumption period needs to be defined
- Number of days the HPT was out of stock during the consumption period
- Avoidable waste (expiries, losses, pilferage) quantified
- Positive and negative adjustments
- Desired maximum months of stock
- % for increase in projected consumption (takes care of expected changes in consumption patterns)
- Consideration of lead time and safety/buffer stock in calculating the order quantity
- Opening stock and closing stock of the reporting period
- Quantity received during the consumption period
- Quantity on order but not yet received

Safety/buffer stock cushions the facility against stockouts of HPTs, unanticipated increase in demand, longer/delayed lead time from the supplier.

SECTION 2

Lead time is the period between when an order is placed and when HPTs are delivered to the facility for use.

Adjustments are done to the consumption data taking into account number of stockout days and avoidable waste.

Calculation of quantity of each HPT required in the next procurement period and compilation of all HPTs quantification data.

Estimate cost for each HPT, calculate the total cost for all HPTs, compare total costs with the available budget and make adjustments if necessary.

(The steps used and an example are outlined in the annex 7)

Demographic/population method

Demographic/population data can be used to estimate requirements for HPTs. It is based on the principle that if the population expected to seek a method/product is known, or can be projected or calculated; and the usage of the product is known either through established protocols or practice, then the total commodity needs can be calculated.

The demographic method can be used for:

- Established systems
- New programs or for new products
- Rapidly expanding programs
- For programs with changing method mix e.g. family planning
- Where using consumption data or services data is not appropriate because the data is missing or incomplete

Examples of data required to use the method;

- Population - actual and projected. If the population projections are not available, then the population growth rate should be known
- Prevalence of use of the method/product i.e. percentage/proportion of users of a method/product in a population
- Source mix - where a product is available from several sources e.g. Government and donors, the proportion from each should be known

Limitations

- The method may overestimate the requirements of a product

Using services data for quantification

Services data can be used to estimate the requirements for HPTs. The method is based on the principle that if the number of clients seeking a service are known, or can be projected; and the quantity of HPT required to offer the service to each client is established either through protocol or practice, then the total commodity needs can be calculated.

This method can also be used:

- In established systems
- Where using consumption method is inappropriate because data is missing or incomplete
- To validate the estimates obtained from consumption and demographic methods

The following data is required to use services data in quantifying HPTs;

- Number new of clients per method/product
- Number of revisit clients per method/product
- Commodities required per user for every method/product

Morbidity method

Morbidity refers to the number of cases of a particular disease in a region. In this forecasting method, the number of patients who are treated for a specific disease condition together with the standard dose for one case of illness is utilized to forecast HPT requirements.

It relies on a system where availability of reliable morbidity data is consistent. Two key assumptions for this method are that all health practitioners follow standard treatment guidelines and that each disease has one main treatment. If there are proportions of patients that receive different treatments, the specific ratios should be known and consistent.

A simplified formula for forecasting HPT requirements through this method is provided below.

Total quantity of each Health Product required in a region	=	Number of cases of a given illness in the region	X	Quantity of HPT required to treat one case of the illness
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The morbidity method has some limitations including the following:

- It is only possible if accurate and reliable data on morbidity and patient attendance are available. However, health systems only track and report morbidity data for a limited number of diseases e.g. the top 10 causes of morbidity in a catchment area
- It assumes that incidence and/or health facility utilization remains the same or increases by an agreed factor
- It is complex, time consuming and requires advanced computer skills especially for large data sets
- Its accuracy depends on the degree to which STGs are followed and availability of pharmaceuticals

Proxy-consumption method

The proxy consumption method uses data on disease incidence, medicine consumption, demand, or use, and/ or pharmaceutical expenditures from a “standard” supply system and extrapolates the consumption or use rates to the target supply system, based on population coverage or service level to be provided.

Quantifying HPT supplies in emergency situations

When quantifying for emergencies, the best practice would be to select the most appropriate methodology depending on the situation or potential hazard. A combination of demographic and morbidity methods of quantification may be applied.

The table below summarizes critical considerations during an emergency:

Considerations for HPT supply chain in emergency situations	
Steps	Activity
Commodity Planning	Determine essential commodities to procure and stockpile based on potential hazards
Quantity Forecasting	Quantify the essential commodities required in an emergency.
Procurement and Sourcing of Emergency commodities	Identify suppliers and determine their capacity to meet needs in an emergency.
Warehousing and Storage for Emergency Response.	Map storage infrastructure to manage inventory of essential commodities during an epidemic.
Transport	Determine how commodities will flow from stockpiles and storage points to the service delivery points.
Waste management	Develop a plan for disposal of the contaminated materials generated during an epidemic.
Logistics management information system (LMIS)	Utilize a logistics management information system (LMIS) or other data system for effective management of logistics data.

Adopted from Kenya Emergency Supply Chain Framework 2019

2.4.4 Data Cleaning and Analysis

The value of each product forecasted is determined based on the adjusted consumption as described above and the latest purchase price (usually from the Kenya Medical Supplies Authority). Quantification teams should review the outputs of forecasts by facility and make a judgement on the accuracy. Special attention should be given to common sources of error such as pack sizes and unit prices. Teams should check and validate any items that appear to have exaggerated values.

Table shows a guide of expected contribution by category.

Commodity category	Approximate percentage of Total
Pharmaceuticals	30% – 40%
Medical Supplies	20% – 30%
Laboratory	15% – 20%
Nutrition	5%
Radiology	5%
Others	5%

Table shows the expected forecast values by facility type

Facility Type	Approximate commodity cost for 15 months (Ksh)
Level 4 Hospitals	12m To 30m
Health Centers	2.4m To 3.6m
Dispensaries	1.2m To 2.4m

2.5 Data Extrapolation

As mentioned in section 2.3.6 above, it is usually not feasible to collect data for forecasting from all facilities to be quantified for in a county or nationally and this necessitates sampling at the data collection stage. The proxy-consumption method of forecasting is therefore applied to extrapolate the requirements for all facilities that do not provide data for forecasting. This method utilizes forecasts for sampled 'standard facilities' to project requirements for all facilities within a county or nationally. The standard facilities should be representative of various levels of care and workload categories. It is therefore necessary to determine commodity requirements of a standard dispensary, health center and hospital. Concerning service workload, facilities with both low and high volumes of patients should be forecasted separately. Requirements for all facilities are thereafter determined as follows

- HPT requirements of all low-volume facilities = Total number of low-volume facilities x HPT requirements of a 'standard' low volume facility

Similarly

- HPT requirements of all high-volume facilities = Total number of high-volume facilities x HPT requirements of 'standard' high-volume facility

Although HPT requirements for hospitals can also be determined with the above approach, it is better to collect data from each hospital and prepare a forecast for each as a unique entity.

The above approach is applied to forecast for each of the HPTs whose requirements are projected.

2.6 Supply planning

Supply planning is the last output of the quantification process that determines the quantities required to fill the health product pipeline, their related costs, lead times, and shipments dates to ensure optimal procurement and delivery schedules. To align the quantification process to the national medium-term expenditure framework, supply plans developed in the quantification process will cover a period of three years and are used to identify funding sources and to mobilize additional resources to meet funding gaps, if needed. The basic steps in supply planning are outlined below:

Step 1: Organize and Analyze the Data:

The following data is needed to develop a supply plan:

- County stores and facility -level stock on hand (physical inventory) of each product to be quantified

SECTION 2

- Expiry dates for products in stock, to ensure they will be used before expiration
- Quantity on order—any shipment quantities of product(s) on order, but not yet received
- Established maximum and minimum stock levels
- Supplier information
 - prices
 - packaging information
 - lead times
- Funding information
 - all funding sources for procurement of commodities
 - amount and timing of funding commitments, by funder
 - disbursement schedules to determine when funding will be available for procurement, from each source
- Procurement information
 - All procurement mechanisms (e.g., government or international bidding/tendering, donor procurement, or local procurement) for all products to be quantified
 - Procurement lead time for each procurement mechanism
- Distribution information
 - in-county storage and distribution costs, if applicable

As with the forecasting step, where data are unavailable, incomplete, unreliable, or outdated, assumptions must be made.

Step 2: Build the Supply Planning Assumptions

As previously mentioned, the most critical point in the assumptions-building process is to document clearly and specifically the sources of information and the key informant inputs on the assumptions. And, as in the forecasting step, consensus must be reached by the quantification team on the supply planning assumptions. For the supply planning step, assumptions may need to be reached on introduction of new commodities and utilization of existing stocks to avoid expiries, the timing of available funds, lead times for each supplier, exact amounts of funding available, and estimates on arrival dates of supplies.

If a maximum-minimum inventory control system has not been formally established, the quantification team will need to make assumptions about the maximum and minimum stock levels at each level of the health system, such as facility and county levels.

Step 3: Estimate the Total Commodity Requirements and Costs

Estimating the total commodity requirements consists of determining the quantity of each product needed to meet the forecasted consumption, and to ensure that the in-county supply pipeline has adequate stock levels to maintain a continuous supply to health facilities.

The estimate of the total commodity requirements for the forecast period is

- the sum of
 - the quantities required as determined by the forecast,
 - additional quantities of product needed to cover procurement and supplier lead times and buffer stocks, and, as needed,

- any significant quantities that will be removed from inventory due to expiry before usage,
- and then subtracting
 - the quantity of each product already in stock in the county (stock on hand) and
 - any quantities that have been ordered but not yet received (quantity on order).

In some cases, shipment delivery schedules need to be adjusted to accommodate constraints in the storage and distribution capacity of the supply chain system (i.e., scheduling more frequent shipments of reduced quantities rather than scheduling larger shipments).

Use the following formula to estimate the quantities required:

$$\text{Forecast consumption quantities} + \frac{[(\text{Forecast consumption quantities}/12) \times \text{Maximum stock level for the entire pipeline}]}{12}$$

It is important to use the maximum stock level for the entire pipeline, which is calculated by adding the established maximum stock levels for each level of the system.

At this step in the quantification, an assessment of the in-county stock status is needed to calculate the quantities of each product to be ordered, which can reasonably be expected to be stored, distributed, and used before expiration. Assessment of the in-county stock status, that is, months of stock (MOS) for each product, estimates how long the existing stocks of each product are going to last. A sample template of the supply plan is provided in the section of this handbook (see Annex 7).

Step 4: Develop the Supply Plan

A shipment should be scheduled to arrive when the facility/county MOS reaches the established minimum stock level. The quantity of product to order should bring the MOS back up to the established maximum stock level. Round the quantity to order up to the nearest whole unit of supplier packaging.

The next step is to estimate the cost of the total commodity requirements by multiplying the supply plan requirements per commodity by the unit cost. Updated sources of information on health product prices and supplier rates are needed to estimate the cost of the quantities of medicines to be ordered. In addition, information on the cost of insurance and freight, customs clearance and duties, and in-county storage and distribution costs may need to be added to the cost of the quantities of medicines to be procured, if it is not included in supplier rates or budgeted for through other mechanisms or waiver agreements.

Flexible procurement contracts with suppliers are recommended so that shipment quantities can be adjusted to respond to an uptake in services, and fluctuations in patient demand, existing stock levels, and rates of consumption. Agreements with suppliers may also need

to include flexibility in delaying shipments into the year following the year of the forecast, if uptake of services does not meet expected demand.

Step 5: Compare Funding Available to Total Commodity Costs

The final decision on the quantities to procure will be determined by the amount of funding available for procuring the products. As a result of the quantification, where sufficient funding is available, the final quantity to procure for each drug will be the same as the quantity to order.

If funding is insufficient, the quantification team will need to determine whether additional resources can be mobilized. An effective mechanism for this can be presenting the quantification results, illustrating what the funding gap is in order to ensure all stakeholders are aware of the funding gap and if possible, can provide additional resources for procurement of the required quantities of products.

In situations of non-full supply, when it is impossible to mobilize additional resources to procure the full quantities of products required, the supply plan may need to be adjusted, or forecasted quantities of products expected to be dispensed will need to be reduced.

This is done by returning to the relevant step in the quantification and engaging in further consultation and consensus building to adjust the assumptions.

After adjusting the assumptions, the quantification team will need to repeat the steps in the quantification process by calculating the forecasted monthly consumption of each product to the final calculation of the actual quantities of each product to procure, or by adjusting the supply plan to reconcile the results of the quantification with the funding constraints.

If adjustment of assumptions is insufficient, it will be necessary to prioritize the procurement list to match available financial resources. Various techniques such as VEN (vital, essential and non-essential) analysis and ABC analysis can be used to select priority health products and to reduce the quantities of less cost-effective health products. An ABC analysis assembles data from recent or projected procurements to determine where money is being spent, allowing managers to focus first on high-cost items when considering ways to reduce procurement costs.

In a VEN-analysis, the drug budget is organized according to health priorities: Vital drugs (lifesaving), Essential (not necessarily lifesaving but able to cure severe illness) and Non-Essential (lower therapeutic value). Vital drugs should always be purchased in sufficient quantity, no matter what, whereas for Essential and certainly for Non-Essential drugs, there is more leverage. A VEN priority list should be defined in advance of any decision related to reducing procurement. The VEN process is summarized in Box 1.

Box 1 | How to Prioritize Orders using VEN**How to Prioritize Your Order**

Systematically order items according to the **VEN system** where items are rated according to therapeutic importance. Look at an **ABC analysis** of your (past or planned) expenditure on EMMS where items are ranked according to their total costs and check how this compares with their VEN ratings

Minimize use/ordering of liquid oral preparations for children as these are dose-for-dose much more costly than the equivalent tablets which may often (but not always) be easily split to provide the required paediatric dose

Avoid multiple presentations of the same item e.g. avoid ordering amoxicillin tablets 250mg and amoxicillin tablets 500mg. Simply order more of the lower strength preparation and use multiples of this to obtain higher doses if needed

Minimize use/ordering of injectables if possible. They are much riskier for the patient, generally very expensive and have several additional associated costs (nursing care/administration, needles and syringes)

In the longer term, **carefully examine and evaluate prescribing practices** to ensure these are appropriate to real therapeutic needs

SECTION 3: USING THE RESULTS OF QUANTIFICATION



SECTION 3

The quantification team should formally present the results of the quantification to the CS TWG. A report template has been provided in Annex 8. The CS TWG will review the assumptions that were made during the forecasting step, as well as the data sources used. The quantification team will update the forecasts and supply plan based on feedback from the CS TWG. The revised estimates and supply plan will then be approved by the CS TWG for presentation to the County Health Management Team (CHMT) for further input after which it will be forwarded to the County Director of Health.

The County Director of Health will then present the commodity forecast to the Chief Officer Health (COH) and County Executive Committee Member, (CECM) Health to obtain their input and outline the actions required to maintain adequate stock levels. The CS TWG will finalize the quantification report incorporating feedback from the CHMT, COH and CECM, Health. The CECM, Health will present the report to the Health Committee for use as an advocacy and budget planning tool. Counties may have a different procedure than the one outlined here. The goal is to ensure all that are involved have a chance to review the report before it is finalized.

These presentations to stakeholders can facilitate the following decisions:

- Planning and budgeting decisions
- Mobilization and allocation of funding for commodity procurement
- Coordination of multiple sources of funding for procurement
- Informing procurement actions on which products to procure, how much to procure, and when to procure
- Adjusting timing of procurements and shipment delivery schedules to ensure continuous supply while avoiding stockouts and overstocking

When conducting a presentation, the presenters should explain each step of the quantification, including:

- Scope, purpose, and timeframe of the quantification
- Review of all data sources used and challenges in data collection
- Summary of the major forecasting assumptions and description of what data sources were used to make those assumptions
- Summary of supply planning assumptions (especially if assumptions about amounts and timing of funding commitments will affect procurement and delivery)
- Total quantities of each product required for each year of the quantification
- County stock status (Stock on Hand) for each product, highlight products that are about to expire, stocked out, or overstocked, based on stock status analysis (Stock on Hand)
- Summary of shipments, by supplier
- Total funding gaps for the next 24 months
- Specific actions required to address any critical stock imbalances and to maintain stocks at the established levels

SECTION 4:

REVIEWING AND UPDATING THE QUANTIFICATION



SECTION 4

Quantification does not end when the final quantities and costs have been determined. It is an ongoing process of pipeline monitoring: reviewing and updating the forecasting and supply planning data and assumptions, which, in turn, may require a recalculation of the total commodity requirements and costs. For the quantification exercise to be useful and effective, the forecasting assumptions and the supply plan should be reviewed and updated at least every six months, and more often for rapidly growing or changing programs. Routine pipeline monitoring should take place monthly unless new data are available more frequently. Ongoing monitoring and updating of the quantification is critical to keeping facility managers, county service coordinators, program managers, donors, and other stakeholders informed on the availability of medicines. It is a vital precondition for timely decision making on product selection, financing, and delivery of commodities.

Reviewing and updating the quantification involves the following activities:

- Review and update the forecasting data and assumptions
- Collect data from LMIS regarding consumption, stock on hand, and losses and adjustments. Check and validate accuracy and completeness of data. At the end of every physical inventory count or removal of expired products from the existing stock, the stock on hand information as well as any adjustments should be updated in the supply planning tool so that the stock on hand in the tool reflects the most up-to-date stock on hand data in the county
- Update stock on hand in the supply planning tool
- Update status of any planned or ordered shipments.
- Update suppliers, prices, and other product data.
- Update the actual consumption for each product and comparing the actual consumption against the forecast consumption to determine the quality of the forecast or the degree of error/forecast accuracy
- Calculate or recalculate the forecasted consumption. The updated forecast data and assumptions should be computed to generate a new forecast, which is entered into the supply planning tool.
- Assess county stock status for each product, based on product consumption and stock levels
- Review and update shipment delivery schedules to ensure continuous supply and to maintain desired stock levels
- Update the amounts and the timing of funding commitments
- Recalculate the commodity requirements and costs, over time
- Estimate update funding needs and gaps for procurement

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ANNEXES

Annex 1: Terms of Reference for the National HPT Quantification Team

Purpose

The purpose of the quantification team is to coordinate the quantification process for basic/essential health products, offer leadership and ensure timely completion of the quantification.

Membership

1. DHPT
2. Representatives from the following divisions:
 - Clinical Laboratory
 - Dental
 - Nursing
 - Nutrition
 - Occupational therapy
 - Orthopaedic Trauma
 - Physiotherapy
 - Radiology
3. Supply Chain Implementing partners
4. KEMSA representative
5. Other ad hoc members to be identified by the HPT TWG

Roles and responsibilities

- Develop a plan for quantification
- Identify relevant key stakeholders
- Plan for stakeholders meeting, working group meetings and any other relevant meeting/training for quantification
- Participates in the planning process including defining scope, selection/review of quantification lists
- Attend the planning, stakeholders and working group meetings
- Aggregate quantification reports from counties
- Provide guidance on data gaps can be filled where feasible
- Lead in consensus building on inputs for quantifications as well as assumptions
- Document consensus building process
- Lead in reconciliation between forecasted estimates and available HPT budget and supply planning for health products
- Write the national report for forecast and supply planning process
- Members should be consistently available for during the quantification process

Deliverables

- Quantification road map
- List of stakeholders for participation in quantification process
- County quantification reports
- Aggregation of data required in forecasting and supply planning
- National Quantification report (forecasting and supply planning process and output)
- Technical report on quantification process

Annex 2: National Quantification calendar

	Activity/Sub-activity	Responsible	Timelines
1	Establishment of annual cycle for national quantification activities	Head, DHPT	July
2	Announcement for quantification process by the official(s) or office that will manage the process	Head, DHPT	July
3	The Unit defines the objectives, coverage and scope of the quantification and informs the HPT TWG/ quantification committee	Head, DHPT	July
4	Distribute data collection forms / templates	Quantification Team	August
5	Undertake Data Collection/Collation/Analysis activities	Quantification Team	September
6	Arrange a 5-day National Quantification Exercise for the Quantification committee and stakeholders a. Aggregate quantities of health products needed using appropriate methods b. Review quantities, adjust aggregated quantities as needed c. Establish final quantities and values of health products as outputs to be included in the national quantification report	Quantification Team	October
7	Prepare quantification draft report and circulate to HPT-TWG	Quantification Team	October
8	Develop plans for dissemination / communication of the quantification report to stakeholders	HPT-TWG	November
9	Identify funding gaps and initiate resource mobilization discussions with partners	HPT-TWG	November to February
10	Review the just concluded quantification process, with recommendations and plans to improve and to resolve problems encountered	HPT-TWG	January
11	Establish tracking system for post- quantification activities, including procurement and funding re- arrangements	HPT-TWG	Continuous
12	Conduct a semi-annual review of the forecast and supply plans and make necessary adjustments	HPT-TWG/ Quantification Team	January & July

Annex 3: Terms or reference for the County Quantification team

Purpose

The purpose of the quantification team is to coordinate the quantification process for basic/essential health products, offer leadership and ensure timely completion of the quantification.

Membership

1. County Pharmacist
2. Sub-County Pharmacists
3. County/Sub-County medical laboratory technologist
4. County/Sub-County nursing officer
5. Supply chain management officer
6. County/Sub-County Nutritionist
7. County/Sub-County dentist/oral health officer
8. Physiotherapist/occupational therapist/orthopaedic technologist
9. County/Sub-County Radiographer
10. County/Sub-County Health Records Information Officer
11. Supply Chain Implementing partners
12. KEMSA representative
13. Other ad hoc members to be identified by the CS TWG

Roles and responsibilities

- Develop a plan for quantification
- Identify relevant key stakeholders
- Plan for stakeholders meeting, working group meetings and any other relevant meeting/training for quantification
- Participate in the planning process including defining scope, selection/review of quantification lists
- Attend the planning, stakeholders and working group meetings
- Identify and gather data required, gaps and provide guidance on how the gaps can be filled where feasible
- Analyze data for trends and past performance
- Lead in consensus building on inputs for quantifications as well as assumptions
- Document consensus building process
- Lead in estimation of health product requirements (forecast) and supply planning for the FP commodities
- Write a report for forecast and supply planning process
- Members should be consistently available for during the quantification process

Deliverables

- Quantification road map
- List of stakeholders for participation in quantification process
- Defined scope for the quantification including list of products
- Completed quantification worksheets
- Aggregation of data required in forecasting and supply planning
- Quantification report (forecasting and supply planning process and output)
- Technical report on quantification process

Annex 4: Quantification calendar**County Quantification calendar**

	Activity/Sub-activity	Responsible	Timelines
1	Establishment of annual cycle for county quantification activities	County Health Director	July
2	Announcement for quantification process by the official(s) or office that will manage the process	County Health Director	July
3	The Unit defines the objectives, coverage and scope of the quantification and informs the CS TWG/quantification committee	County Health Director	July
4	Distribute data collection forms / templates	Quantification Team	August
5	Undertake Data Collection/Collation/Analysis activities	Quantification Team	September
6	Arrange a 5-day County Quantification Exercise for the Quantification committee and stakeholders a. Estimate quantities of health products needed using appropriate methods for quantification b. Review quantities, adjust estimated quantities as needed c. Establish final quantities and values of health products as outputs to be included in the quantification report	Quantification Team	October
7	Prepare quantification draft report and circulate to CS TWG	Quantification Team	October
8	Develop plans for dissemination / communication of the quantification report to stakeholders	CS TWG	November
9	Identify funding gaps and initiate resource mobilization discussions with partners	CS TWG	November to February
10	Review the just concluded quantification process, with recommendations and plans to improve and to resolve problems encountered	November to February	January
11	Establish tracking system for post-quantification activities, including procurement and funding re- arrangements	CS TWG	Continuous
12	Conduct a semi-annual review of the forecast and supply plans and make necessary adjustments	CS TWG/ Quantification Team	January & July

Annex 5: Draft Quantification Program for County Level

DEPARTMENT OF HEALTH
 County
 QUANTIFICATION & SUPPLY PLANNING WORKSHOP FOR FY.....
 Date:
 Venue:

Day 1:

Session Chairs:

Rapporteur:

Time	Session	Time allocated	Facilitator
08:30 – 9:00	Registration	30 min	
09:00 – 09:20	Introduction and expectations	20 min	
09:20 – 09:30	Opening Remarks	10 min	
09:30 – 09:45	Workshop Objectives	15 min	
09:45 -10:30	Introduction to Quantification	45 min	
10:30-11:00	Tea Break	30 min	
11:00 – 11:30	Forecasting Methodologies	30 min	
11:30 – 12:15	Assumptions and Decision Making for Forecasting	45 min	
12:15 – 13:00	Introduction to Facility Data Validation (Participants in sub county teams)	45 min	
13:00-14:00	Lunch	60 min	
14:00-16:30	Group work – Validation of facility data by sub county teams	150 min	
16:30	Tea Break and adjournment		

Day 2:

Session Chairs:

Rapporteur:

Time	Session	Time allocated	Facilitator
08:30 – 8:45	Recap of Day 1	15 min	
08:45-10:30	Group work – Aggregation of facility data by sub county teams	105 min	
10:30-10.45	Tea Break	15 min	
10:45-13:00	Group work – Extrapolation of facility requirements by sub county teams	135 min	
13:00 – 14:00	Lunch	60 min	
14:00 – 15:00	Group work – Validation of extrapolated requirements by sub county teams	120 min	
16:30	Tea Break and Adjournment		

Day 3:

Session Chairs:

Rapporteur:

ANNEXES

Time	Session	Time allocated	Facilitator
08:30 – 8:45	Recap of Day 2	15 min	
08:45 – 10:30	Group work – Aggregation of Subcounty Data	135min	
10:30-10.45	Tea Break	15 min	
10:45-13:00	Group work – Presentation of Quantification Outputs	135 min	
13:00 –14:00	Lunch	60 min	
14:00 – 16:00	Rationalization of quantified commodities against budgets	60 min	
16:00 – 16:15	• Way Forward • Appreciations	75 min	
16:15 – 16:30	Closing remarks	15 min	
16:30	Tea Break and departure		

Annex 6: Quantification tools: Spreadsheets e.g. Excel quantification tool

Health Facility Quantification and Budget Tool

Fill in all the shaded cells; If using a computer, please enter facility name and county details in cover page tab

Facility Name		Sub-County	
Date Prepared		County	
Facility Type		Pharmaceuticals	
Health Commodity Category			

months to be covered by quantification: 0 Buffer (in months of stock): 0

Item Description (Name, Form, Strength)	Pack Size	Price KES	Stock on Hand (in Packs)	Consumption (in Packs) Indicate below the Monthly/Year for which data is captured	# of days out of stock Indicate below the Monthly/Year for which data is captured	Quantity Required + Buffer (Packs)	Comments
# PHARMACEUTICALS (MAIN LIST)							
Item Description (Name, Form, Strength)	Pack Size	Price		Consumption (in Packs) Indicate below the Monthly/Year for which data is captured	# of days out of stock Indicate below the Monthly/Year for which data is captured	Q+Buffer	
1 Acetylsalicylic Acid Tablets - 300Mg	Tin Of 1000S	250				0	
2 Activated Charcoal Tablets	Pack Of 100S	544				0	
3 Acyclovir Tablets - 200Mg	Pack Of 30S	83				0	
4 Adrenaline Injection - 1Mg/1ml	Ampoule	5				0	
5 Albendazole Tablets 400Mg	Tin Of 500S	1,000				0	
6 Alcohol Based Hand Rub	500ml Bottle	240				0	
7 Amoxicillin Tablet 250Mg (Dispersible, Scored)	Pack Of 20S	178				0	
8 Amoxycillin Capsules - 250Mg	Tin Of 1000S	1,400				0	
9 Amoxycillin Suspension, 125mg/5ml	100ml Bottle					0	

Annex 7: Steps in quantification using the consumption method

Step 1

Carry out physical stock-taking for each health product to determine current stock on hand

Step 2

Define your facility supply system parameters

- Consumption Period - how many months?
- Maximum Months of Stock - how many months?

Step 3

Calculate consumption by adding all the quantities of HPTs dispensed/issued in the medicine/health product registers for the specified period.

If the issues are many, consumption can be calculated as:

$$\text{Opening stock} + \text{quantity received} - \text{closing stock}$$

Step 4

Adjust for any losses/avoidable wastages and positive/negative adjustments
(Total quantities dispensed/recorded consumption – losses) ± Adjustments = C1

Step 5

Adjust for stock-outs if necessary

$$\frac{C1 \times \text{Consumption Period (in days)}}{\text{Period in stock (days)}} = C2$$

Step 6

Calculate Average Monthly Consumption (AMC)

$$\frac{\text{Total Consumption (adjusted for avoidable wastage \& stockouts)}}{\text{Consumption Period (in months)}}$$

Step 7

Calculate the Maximum Stock Level

$$\text{Maximum Stock Level} = \text{AMC} \times \text{Maximum Months of Stock}$$

Step 8

Calculate the required order quantity

$$\text{Order quantity} = \text{maximum stock level} - \text{closing stock/stock on hand} - \text{quantity on order not received}$$

Step 9

Compile the quantification data for all HPTs

Step 10

Estimate costs for each HPT and calculate the total costs

Step 11

Compare total cost with the budget and make adjustments if necessary.

Example of Consumption-based Method of Quantification

Using the information provided, determine the quantities of amoxicillin 250mg capsules required by Elementaita Hospital whose total consumption in 6 months was 89,000 with 34 days out of stock. The closing balance was 30,000, 1,000 capsules were unaccounted for and 5,000 capsules were issued to a neighboring facility on loan. The order unit size is 1,000 capsules at a cost of Kshs. 700.

Maximum months of stock for Elementaita hospital is 6 months Budget allocated for amoxicillin is Kshs. 40,000

Step 1	Determine the closing stock (CS)	30,000 (capsules)
Step 2	Define your facility parameters: Consumption period (CP) Maximum Months of Stock	CP = 6 months Max MOS = 6 months
Step 3	Calculate consumption by adding all the quantities dispensed	89,000 caps
Step 4	Adjust for any losses/ Avoidable wastages and positive/negative adjustment: Adjusted consumption (C1) = (Total quantities dispensed – losses) ± adjustments	(89,000 – 1000) – 5000 = 83,000 Caps
Step 5	Adjust for Stock-outs if necessary: $\frac{C1 \times \text{Consumption Period (in days)}}{\text{Period in stock (days)}} = C2$	= 83,000 x 183 = 101,940 caps 149* *149 = (183-34)
Step 6	Calculate Average Monthly Consumption (AMC) Adjusted consumption Consumption Period (in months)	AMC = 101,940/6 = 16,990 caps
Step 7	Calculate the Maximum Stock Level = AMC x Maximum Months of Stock	16,990 x 6 = 101,940 capsules
Step 8	Determine the Actual Quantity to Order = Maximum Stock Level – Closing Stock – Quantity on Order not yet received (if any)	101,940 - 30,000 = 71,940 = 72,000 caps
Step 9	Determining the number of packs/order units to be ordered (may need to round off to the next full pack/order unit which may vary depending on the supplier/source)	This is arrived at by dividing quantities derived in step 8 by order unit size. = 72,000 ÷ 1000 = 72

Note: The maximum stock level is usually dependent on the ordering cycle and the commodities being quantified for

Annex 8: Sample Supply Plan

Item Code	Item Description	Unit Pack	Unit Cost	Funding Source	Procurement Method	AMC	Stock on Hand	Pipeline Qty	Qty required + Buffer Stock + Safety Stock	Stock with less than six months Expiry	Order Qty	Order Value	Shipment Date

Annex 9: Sample outline for quantification report

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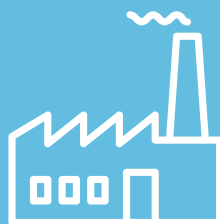
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