The Republic of the Union of Myanmar

Ministry of Health and Sports

Forecasting of Essential Medicines and Related Health Commodities Guidelines

USAID GLOBAL HEALTH SUPPLY CHAIN PROGRAM
Procurement and Supply Management

August 2016

Guidelines for Forecasting of Essential Medicines and Related Health Commodities

Foreword

It is important to ensure adequate amount of the right medicines and commodities are available at right time and in the right place for the successful treatment outcomes. “Forecasting of Essential Medicines and Related Health Commodities Guideline” booklet is prepared by the Ministry of Health and Sports (MOHS) and SCMS, aiming to give technical support to the health professionals who are working in the medical supply chain, in health care facilities and hospitals for estimation of the quantities and cost of medicines and related commodities at their respective procurement sites. The guidelines will provide health officials with the technical assistance to determine the minimum data requirement, the standard forecasting methods and the tools for forecasting of essential medicines and related commodities. By following this guideline, the health care facilities and hospitals are expected to forecast medicines and commodities more accurately, efficient use of medicines, maximize the benefits from available budgets and achieve successful treatment outcomes.

Professor Myint Han
Director General
Department of Medical Services
Ministry of Health and Sports

Acknowledgements

This book would not have been possible without the support and encouragement of Union Minister, Permanent Secretary, Director Generals, and Deputy Director Generals of Medical Services, Director (Medical Care), Director (Procurement), Director (Supply) and Assistant Director (Medical Care). Thank you for the very kind support, collaboration and partnership in the development of "Forecasting of Essential Medicines and Related Health Commodities Guideline". This guideline is to be used in health care facilities and hospitals where decentralized procurements are undertaken either by DPH or DMS. This guideline will be periodically updated by Ministry of Health and Sports (MOHS) and SCMS to comply the changes in line with National Health policies.

About SCMS

The Supply Chain Management System (SCMS) was established to enable the unprecedented scale-up of HIV/AIDS prevention, care and treatment programs in the developing world. SCMS procures and distributes essential medicines and health supplies, works to strengthen existing supply chains in the field, facilitates collaboration and the exchange of information among key donors and other service providers. SCMS is an international team of 16 organizations funded by the US President's Emergency Plan for AIDS Relief (PEPFAR). The project is managed by the US Agency for International Development.

Table of Contents

Acronyms v
Introduction 1
Objectives 2
Steps in quantification activities 3

I. PREPARATION 3
1. When to start forecasting and how frequently it should be done? 4
1.1 Planning of forecasting activities 4
1.2 Selection of medicines and commodities to be forecasted ... 5
1.3 Selection of forecasting method 5
2. Data requirements and source of data 6
2.1 List of medicines and commodities 6
2.2 Consumption data 6
2.3 Stock data 7
3. Data Quality Assurance (DQA) 8

II. FORECASTING ....., ... 9
1. Organize and analyze data 9
2. Building assumptions and adjustments on quantities 9
3. Forecasting tool 9
4. Forecasting steps by using excel template 10
Step 1: Entering medicines and commodities for forecasting 10
Step 2: Entering consumption data 11
Step 3: Entering total days out of stock and calculate adjusted AMC..... 12
Step 4: Defining period for forecasting, cutoff point and buffer 12

Step 5: Entering stock data 13

Step 6: Readjustment of items and quantities in accordance with budget available 14

Stock monitoring and Early Warning System (EWS) 14

References: 15

ANNEX I 16

Table 1: Assumptions and Limitations of two forecasting methods . 16

Table 2: Data requirement for forecasting of essential medicines and related commodities by consumption method 17

Table 3: Issues to be analyzed and adjusted in forecasting 17

ANNEX II 18

Data requirement and formulation used for manual calculation of consumption based forecasting 18

Manual calculation of consumption based forecasting example 19

Data requirement and formulation used for manual calculation of morbidity based forecasting 20

Manual calculation of morbidity based forecasting example 21

ANNEX III 22

Tentative schedule for forecasting and tender process 22

Glossary 23

Acronyms

AIDS	Acquired Immunodeficiency Syndrome
AMC	Average Monthly Consumption
AMS	Assistant Medical Superintendent
CD	Compact Disk
CMSD	Central Medical Store Depot
DMS	Department of Medical Services
DQA	Data Quality Assurance
DPH	Department of Public Health
HIV	Human Immunodeficiency Virus
LMIS	Logistic Management Information System
MOHS	Ministry Of Health and Sports
MS	Medical Superintendent
Q1	Quarter 1
Q2	Quarter 2
Q3	Quarter 3
SCMS	Supply Chain Management System
SOH	Stock on Hand
SOP	Standard Operating Procedure
STG	Standard Treatment Guideline
VEN	Vital, Essential, Non-essential

Introduction

Quantification is a critical component of the supply chain management cycle that links facility-level information on services and commodities with national-level program policies and plans. Results are used to inform high-level decision making on commodity financing and procurement.

It involves estimating the quantities needed of a specific item, the funding required for purchasing the items, and when the products should be delivered to ensure an uninterrupted and optimal supply. Quantification is not a one-time annual exercise; it is a continuous process that requires ongoing monitoring and routine updates.

Quantification has two major components, forecasting and supply planning. ***Forecasting*** estimates the quantities and costs of products required to meet customer demand during a particular time frame in the future. ***Supply planning*** estimates the quantities required to fill the supply pipeline and determining the total costs, lead times, and arrival dates of shipments in order to ensure optimal procurement and delivery schedules.

This guideline was developed by Department of Medical Services, Ministry of Health and Sports (MOHS), with the technical support from SCMS.

Objectives

This guideline is mainly intended to guide the consumption based forecasting for procurement of essential medicines and related health commodities in health care facilities and hospitals. This manual will be useful for key persons in public health, involving in forecasting and stock management, including Pharmacist, Medical Superintendents, and Assistant Medical Superintendents, department Specialists, Ward-in-Charge and Storekeepers of hospitals.

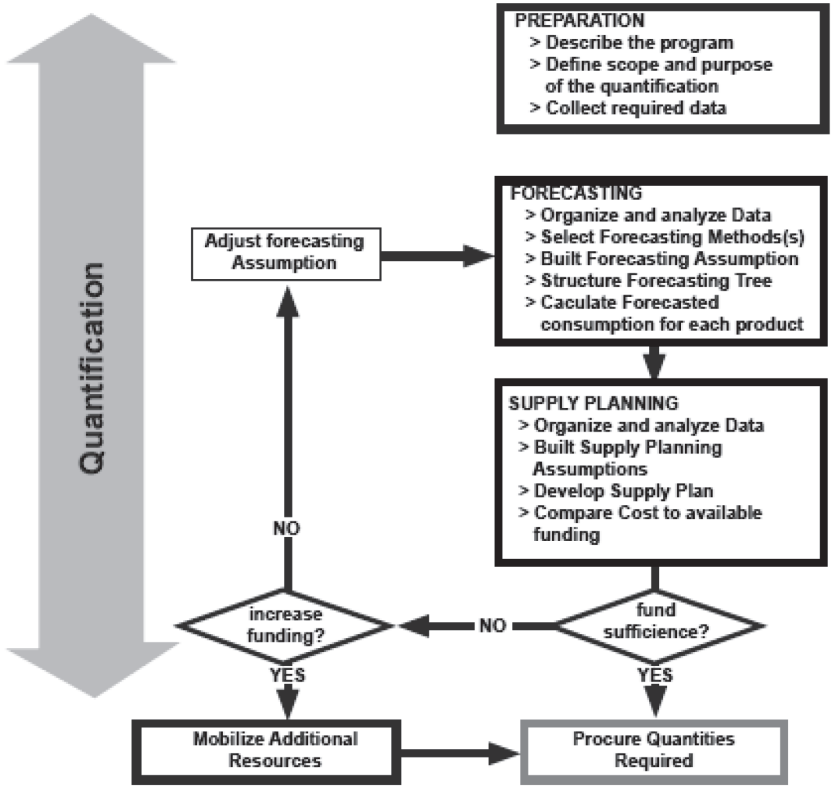
The main objectives of this guideline are:

- To implement a standard process on forecasting of essential medicines and related health commodities in health care facilities and hospitals
- To improve the quality, validity, and accuracy of data required for forecasting
- To use national budgets effectively for procurement of essential medicines and commodities for health facilities and hospitals
- To identify the funding needs and gaps in the hospitals for essential medicine and commodities
- To improve the capacity building of staff in health care facilities and hospitals by practicing standard methods and the tool for forecasting of essential medicines and health commodities

Steps in quantification activities

The following flow chart summarizes the quantification process.

Reference: The following diagram was produced for review by the U.S. Agency for International Development. It was prepared by the USAID / DELIVER PROJECT, Task Order 4 June 2014



I. PREPARATION

Prior to a forecasting process, define the scope, purpose and period of quantification.

Example: Forecasting of essential medicines and commodities required for first cycle procurement of Yangon General Hospital for the period April 2015 to September 2015.

1. When to start forecasting and how frequently it should be done?

- Forecasting is done ahead of the budget proposal rather than simply ahead of the procurement, in order to implement the demand base procurement system in hospitals and health facilities.
- The timing of the forecasting must respect to the commodity lead time and essential to make sure that commodities are received at the beginning of forecast period.

1.1 Planning of forecasting activities

- The timing of forecasting must be complied with budget proposal, procurement planning and supply planning intervals. In order to complete the forecasting at the time of budget proposal, quarterly consumption data must be regularly entered into the standard forecasting tool. The example for tentative time table of tender process for 2 budget cycles which are currently practiced is described in **ANNEX III**.
- The focal person/s for forecasting must be assigned and trained for all procurement entities.
- The trained focal person generates forecasted quantities and estimates costs of commodities for respective health care facility and hospital.
- The final adjustment and projection of AMC for each commodity is done according to the stock out days, assumptions collected and built with the consensus from the persons authorized for procurement decisions.

1.2 Selection of medicines and commodities to be forecasted

Health facilities and procurement entities must follow their guiding principles on selection of medicines and commodities. Standard Treatment Guidelines for different level of treatment centers is the prerequisite for the selection of right medicines and commodities.

1.3 Selection of forecasting method

- The choice of the forecasting method depends on availability of data and assumptions that should fulfill for particular method. The important assumptions and limitations to get the accurate forecast in each method are summarized in **Table 1, ANNEX I**.
- Data requirements and Formulations used in manual calculation for "Consumption" and "Morbidity" methods are listed in **ANNEX II**.
- The "consumption method" is recommended for the "old" medicines and commodities those have consumption data with enough period by which AMC can confidently be calculated.
- For the new medicines and the commodities those were recently procured and did not have reasonable period of consumption data that cannot be confidently used to calculate the AMC (for example, less than 3 month consumption data), the consumption method may not be applicable for forecasting. In that case the morbidity method is the method of choice. The standard way to calculate manually by consumption and morbidity methods are explained in **ANNEX II**.

2. Data requirements and source of data

2.1 Lists of medicines and commodities

- List of medicines and commodities with minimum specifications which include generic name, strength, accounting unit and dosage form.
- Define the price per accounting unit for cost estimation. Accounting unit is the basic unit which is consistently used for consumption, unit price and SOH of a commodity throughout the forecasting process.
- Other optional specifications may include item category, VEN status and supplier of the items for further analysis on stocks.

2.2 Consumption data

- The most reliable consumption data is the "end-user consumption" (dispense to use or consumption by patients at wards/dispensing points). In order to get end user consumption data, a strong LMIS which records daily end-user consumption data at wards/dispensing points must be available.
- The daily consumption is compiled into monthly consumption and reported to the main store. The person in charge of the ward/dispensing point collects the daily consumptions and report to the main store monthly.
- The deadline for receiving end-user consumption data is 7th of the following month after the reporting period.
- If the end-user consumption is not available, the main store issue data to the wards/dispensing points can be used as proxy consumption data.
- Most recent 1-year consumption data is recommended to be used for forecasting of essential medicines and related products. The most recent 1 year data is used for following reasons:

- To catch the seasonal variations in consumption
- To catch recent consumption trends which will closely reflect the future consumptions
- To equalize the uneven distributions of commodities in one year period

2.3 Stock data

- The SOH data is the combination "closing balances" at all levels under each procurement entity. For example, the SOH of a hospital includes SOH of the hospital main store, SOH of all wards and all dispensing points in the hospital.
- If the quantities of SOH at wards and all dispensing points are assumed to have negligible quantities, the SOH of ward level can be excluded from total SOH data. In that scenario, SOH data of the main store only is used for determining procurement quantities.
- The SOH data must readily be available on the 7th of the following month after the reporting period.
- The SOH data also includes:
  - the quantities which will be received during the forecasting period. E.g. quantities those will be provided by CMSD
  - The quantities ordered but not yet received (pipeline quantities)

  An example of minimum data requirements for quantification with consumption method and data definitions is described in **Table 2, ANNEX I:**

3. Data Quality Assurance (DQA)

DQA is crucial for the forecasting accuracy. DQA is not a single process; it is a continuous process which should be conducted throughout the year to ensure data validation and maintaining the data quality. DQA must be done in all levels of data processing. It includes:

- Development of data management manual/SOP for all data processing levels. i.e. main store data management, data management in wards and health facilities
- Development of standard data collection forms and reporting formats of at all LMIS data processing levels
- Ensure timeliness on reporting, regular supervision and data auditing with bottom-up approach starting from end user level to report destination
- Developing DQA checklist for data error/missing data by various methods including:
  - Cross check between data sources
  - Random Checking of forms filled in health facilities for missing values, data inconsistencies and mistakes
  - Regular supervision, capacity and skill building of staff filling the forms and doing the reports

II. FORECASTING

1. Organize and analyze Data

- Do data analysis before the forecasting
- Collect all significant historical information on consumption at the wards/dispensing points and are documented

2. Building Assumptions and adjustments on quantities

Assumptions are made by:

- Analysis of historical consumption data and
- Collecting of information on historical consumptions at end user level and at main store level

Projections are usually done with the consensus from persons authorized from the hospital wards/dispensing points. Some important issues to be analyzed for adjustment/projection are summarized in **Table 3 in ANNEX I**.

3. Forecasting Tool

The simple excel template is used for forecasting of essential medicines and related commodities by consumption method. Microsoft office software 2010 and above is recommended to utilize the full functions of the tool. Technical instructions on how to use the tool is briefly described under the "readme" sheet of the excel tool. The mathematical formulae used in the excel template complies with the formulae used in manual calculation method described in **ANNEX II**. The copy of the excel tool is provided in a CD and it is attached with this guideline. The excel tool is being updated periodically according to the users' feedbacks and user's requirements.

- The excel template uses the single consumption data set compiled for all wards and dispensing points of a health care facility or a hospital.

- The calculated AMC of commodities are adjusted for stock out and projected by assumptions built by analysis of historical consumption data
- Total estimated forecast for the defined period is calculated by multiplying projected AMC and forecasted periods in months
- Final quantity for procurement is calculated by subtracting current stock on hand (SOH) from total estimated forecast for the defined period

4. Forecasting steps by using excel template

Following steps are summarized for forecasting of medicines and related commodities in the simple excel tool. For the health facilities which has few commodities and have limited resources to use excel, forecasting can be done manually with the calculation method mentioned in **ANNEX II**.

Step 1: Entering medicines and commodities for forecasting

- Define medicines or commodities with minimum specifications which includes generic names, strength, accounting unit and dosage form. Example, Amoxicillin 250mg cap. It is mandatory to enter this variable.
- Define the "new" or "old" items: Items those have past consumption data with reasonable period to calculate the AMC are defined as "**Old item**" .Those with no consumption data or those with short consumption which is not reliable to calculate AMC are defined as "**New items**". It is mandatory to enter this variable.
- The medicines and commodities are categorized by standard classification
- Define accounting Unit: It describes the basic unit for pricing of items. An accounting unit for a specific commodity must be consistently used throughout the forecasting process for consumption, SOH data and unit pricing to estimate the budget.

- Enter the price for an accounting unit: The estimated price can be used for costing of forecasted quantities.

Step 2: Entering consumption data

- Most recent 1-year consumption data is recommended to be used for calculation of AMC. To comply with the quarterly reporting system, 3 monthly (quarterly data) consumption data is used for forecasting. At the end of a reporting period (end of a quarter), a new quarter consumption data is entered and delete the oldest quarterly data. This will refresh the calculation of AMC reflected to the average consumption in most recent 1 year period. Examples of defining most recent 1 year consumption data and date for SOH data at each quarter is explained in following table.

Cutoff point	Consumption data	SOH data
30, Sep 2015	Enter Q4 2014, Q1, Q2, Q3 2015 (Valid data - Q4 2014, Q1, Q2, Q3 2015)	30, Sep 2015
31, Dec 2015	Delete Q4 2014 Enter new Q4 2015 (Valid data - Q1, Q2, Q3, Q4 2015)	31, Dec 2015
31, Mar 2016	Delete Q1 2015 Enter new Q1 2016 (Valid data - Q2, Q3, Q4 2015, Q1 2016)	31, Mar 2016
30, Jun 2016	Delete Q2 2015 Enter new Q2 2016 (Valid data - Q3, Q4 2015, Q1, Q2 2016)	30, Jun 2016

- AMC is calculated automatically by valid consumption data. Define "0" in consumption data box, if there is no consumption in a period.
- Note any issues which impact on historical consumption.

Step 3: Entering total days out of stock and calculate adjusted AMC

- Stock out day(s) during specific quarter of consumption must be determined accurately and entered in the box defined for specific period. Days out of stock is not reported in current reporting system of hospitals and health facilities. If there is no stock out report in the current report format, the report format should be revised to report "stock out days"
- When there is no consumption in a period, the quantity in consumption box must be defined as "0".
- Once "stock out days" data is entered, adjusted AMC is automatically calculated in excel
- The AMC could be increased or decreased by projection (% of AMC increased or decreased). The projection must be carefully done by authorized and experienced person. The reason/s for doing projection (if any) must be noted in the column named "assumption for projection". Some important reasons to do this projection is listed in **Table 2 in ANNEX I**.
- The final projected AMC will be automatically calculated by excel.

Step 4: Defining period for forecasting, cutoff point and buffer

- The cutoff point is defined to the date at which most recent SOH data is available
- Then beginning and end dates of forecasting period are required to enter in the excel template

- The assumption is made that all commodities will be received at the date of beginning of forecasting period. The period in-between the current time and beginning of forecasting period must be long enough for lead time of the commodities planned to be procured.
- The desire buffer is defined by months.

Step 5: Entering stock data

- Enter stock data at a cutoff point.
  - **Stock on hand (SOH)**: quantities remaining in main store and all other levels at a cutoff point. If SOH quantities in wards are negligible, it can be excluded from total SOH.
  - **Ordered but not yet received from suppliers**: if those quantities will be received before the current stocks run out, those quantities need to be added in SOH.
- Forecast quantities are automatically generated by excel. The automatic excel report includes:
  - **Quantities required for the reference period**: those quantities are in immediate needs. Those quantities cannot be ordered and received by routine procurement. An accelerated/ emergency order need to be done.
  - **Quantities required for the forecast period**: those are the quantities required by routine procurement process.
  - **Quantities and Cost estimates for procurement**: the forecasted quantities and costs are automatically elaborated in “procurement list”.

Step 6: Readjustment of items and quantities in accordance with budget available

- Readjust the forecasted quantities, if available budget is not enough for the procurement of estimated forecast quantities.

- Go back to Step 3 for readjustment of items and quantities. VEN status may be used for readjustment of the quantities.
- Take consensus from authorized persons for procurement for final decision on readjustment. Readjustment may need several times until estimated budget is matched with the available budget.

Stock monitoring and Early Warning System (EWS)

- In addition to the forecasting function, the excel tool has "Stock monitoring and Early Warning System (EWS)" functionalities.
- By updating SOH in the excel tool every quarter, stock status can be monitored.
- Excel will show the current stock status by following indicators and suggest the necessary actions to be taken.
  - Total estimated expired quantities and expected costs by wastage
  - 4 stock status indicators are elaborated by defined lead time, minimum and maximum stock levels: Stock out, Impending Stock out, Excess and optimum
  - Suggested action to be taken indicated with: Emergency order, Redistribute, to check usage and estimated time to order
- Stock status is also indicated by a bar graph in 3 year calendar
- Current stock status is also showed by "months of stock"

References

1. USAID | DELIVER PROJECT, Task Order 4. 2014. *Quantification of Health Commodities: A Guide to Forecasting and Supply Planning for Procurement*. Arlington, Va.: USAID | DELIVER PROJECT, Task Order 4.
2. Technical Assistance in Quantification, Supply Chain Management Cluster: Joseph Adu, Gabriel Daniel, Reem Ghoneim, Wonder Goredema, Oliver Hazemba, Kanjinga Kakanda, John Marmion, Andualem Oumer, Mavere Tukai, SIAPS, System for Improved Access to Pharmaceutical and Services, J
3. USAID | DELIVER PROJECT, Quick Reference: Quantification Planning, Task Order 4. 2014. *Quantification of Health Commodities: A Guide to Forecasting and Supply Planning for Procurement*. Arlington, Va.: USAID | DELIVER PROJECT, Task Order 4.
4. MSH, Management Sciences for Health, 2006, *Quantimed Pharmaceutical Quantification and Cost Estimation Tool: User's Guide*, Version 1.2, Prepared by the RPM Plus Program and submitted to the U.S. Agency for International Development, Arlington, VA: Management Sciences for Health.
5. Manual for Quantification of Essential Medicines, Myanmar Essential Drug Project, August 2004.

ANNEX I

Table 1: Assumptions and Limitations of two forecasting methods

Method	Assumptions	Limitations
Consumption Method	Historical consumption patterns are expected to continue	Not accurate for irregular consumption pattern Not applicable for new formulations, new treatment and new programs
	Consumptions data/ reports are accurate and comprehensive	Relies on accurate and comprehensive consumption data. If the reporting rate is low, the consumption could be lower than actual
	System at full supply from higher level	If there is interrupted supply from higher level, the consumption could be lower than actual demand
	System at demand base supply from higher level (no push consumption)	If there is push supply from a higher level, the consumption could be higher than actual demand
	Rational Use of medicines	If there is irrational use exist in the system, the forecast will continue this irrational use pattern

Morbidity Method	Historical prevalence/ incidence of the disease/s patterns are expected to continue	Not accurate for irregular disease pattern
	STG exists and the treatment services follows the guideline	Not applicable if there is no STG exists Not accurate when a treatment service does not follow the guideline
	Needs assumptions for • Scaling up plan and targets • Attrition rates • Failure rates • Proportion of treatments	Complex calculation especially for chronic diseases. Time consuming and computer analysis may need

Table 2: Data requirements for forecasting of essential medicines and related commodities by consumption method

No	Item (Generic name strength, form)	Item category	VEN status	Account-ing Unit	Unit Price (kyats)	Q4 2013		Q1 2014		Q2 2014		Q3 2014		Stock in hand (SOH)	Quantity in Order (ONR)	Quantity to receive (Ros)
						C	SO	C	SO	C	SO	C	SO			
1	Amoxicillin 500mg cap	Tab Antibiotic	E	Capsule	100											
2	Cannula 18G															
3	Catgut plain 3/0 20cm															
4																
5																
6																

Cut off point: End of September 2014, C = Consumption, SO = Stock Out days in the period

Table 3: Issues to be analyzed and adjusted in forecasting

Issues	Analysis	Adjustment
Stock out events	Consumption data	Adjust by stock out days
Amount of medicines purchased by patients	Records available for patient purchased drugs	To increase the amount to be procured
Missing report	Reporting rates	Adjusted for missing reports
Changes in treatment guideline/ treatment option	Review new and existing treatment guidelines	To switch items To adjust quantities according to changes in guidelines
Changes in consumption, disease patterns	Analysis on consumption trends, disease patterns	To decrease or increase quantities according to the findings
Irrational use of medicines (physicians' preferences)	Analyze consumption data if there is irrational use of drugs	To correct right items according to the standard treatment guideline
Push consumption to hospital wards	Analyze issue data to find out push consumption	To decrease the quantities
Scaling up hospital activities	Review future plans	To increase the quantity

ANNEX II.

Data requirement and Formulations used in manual calculation of consumption based forecasting

Step1. Calculation of Average monthly consumption, adjusted for stock-outs

$AMC_A = C_T \div [R_M - (D_{OS} \div 30.5)]$

AMC_A = Average monthly consumption, adjusted for stock-outs

C_T = Total consumption during the review period

R_M = Total consumption review period in months

D_{OS} = Number of days an item was out of stock during the review period

Step2. Calculation of Projected AMC

$AMC_P = AMC_A \pm (AMC_A \times A_U)$

AMC_P = Projected average monthly consumption

AMC_A = Average monthly consumption, adjusted for stock-outs

A_U = Utilization adjustment (% increase/decrease)

Step3. Calculation of total forecast for the specified period

$QT = FP \times AMC_P$

QT = Total quantity

FP = Forecast period in months

AMC_P = Projected AMC

Step4. Final quantity to be procured

$PQ = Q_T – (SOH + O_{NR})$

PQ = Quantity to be procured

SOH = Stock on Hand

O_{NR} = Quantity ordered, but not yet received

Step5. Total costs for forecast period

C_T = PQ x Unit Cost

C_T = Cost of a product for the forecast period

Manual calculation of consumption based forecasting: an example

Scenario

Total consumption (C_T) = 6,600 tabs

Review period (R_M) = 6 months

Days out of stock (D_{OS}) = 15 days

Utilization adjustment = +5%

Forecast period = 12 months

SOH = 5,000 tabs

Unit cost = 20 Kyats/tab

Step 1. Calculation of adjusted AMC

Adjusted AMC (AMC_A)

= 6,600 ÷ [6 – (15/30.5)]

= 6,600 ÷ 5.5

= 1,200 tabs

Step 2. Calculation of projected AMC

Projected AMC (AMC_P)

= 1,200 + (1,200 x 5%)

= 1,200 + 60 = 1,260 tabs

Step 3. Calculation of total forecast for specified period

Total forecast Quantity (Q_T) = 1,260 x 12 = 15,120 tabs

Step 4. Final quantity to be procured

Procurement Quantity (PQ)

= 15,120 – 5,000 = 10,120 tabs

Step 5. Total cost for the forecast period

Total Cost (C_T) = 10,120 x 20 = 202,400 Kyats

Data requirement and Formulations used in manual calculation of morbidity based forecasting

Step1. Calculating the Quantity required to treat an episode of the disease

$$\mathbf{Q_E = D_{BU} (D_{AD} \div S_{PR}) \times N_D \times L_D}$$

Q_E = Quantity needed for each treatment episode

D_{BU} = Basic units (of the product) per dose/administration

N_D = Number of doses per day

L_D = Length of treatment in days

D_{AD} = Dosage per administration of medicine. E.g. 500mg

S_{PR} = Strength of product. E.g. 250mg

Step2. Calculation of Total expected cases per month

$$\mathbf{EC_M = EC_Y \div 12}$$

EC_Y = Total Expected Cases per year

EC_M = Total Expected Cases per month

Step3. Calculation of total forecast for the specified period

$$\mathbf{Q_T = FP \times EC_M \times Q_E}$$

Q_T = Total quantity

FP = Forecast period in months

Q_E = Quantity needed for each treatment episode

Step4. Final quantity to be procured

$$\mathbf{PQ = Q_T - (SOH + O_{NR})}$$

PQ = Quantity to be procured

SOH = Stock on Hand

O_{NR} = Quantity ordered, but not yet received

Step5. Total costs for forecast period

C_T = PQ x Unit Cost

C_T = Cost of a product for the forecast period

Manual calculation of morbidity based forecasting: an example

Scenario

Prevalence of Pneumonia = 12 cases/1000
Total population = 100,000
One treatment of pneumonia includes:
500mg Amoxicillin 3 times per day for 7 days
Available tablet 250mg
Forecast period = 12 months
SOH = 5,000 tabs

Step 1. Calculating the Quantity required to treat an episode of the disease

Quantity needed for each treatment episode (Q_E)
= (500 ÷ 250) x 3 x 7
= 42 tablets

Step 2. ECM = Total Expected Cases per month

Total Expected Cases per month (EC_M)
= 12 x (100,000/1,000) ÷ 12
= 1200 ÷ 12 = 100

Step 3. Calculation of total forecast for the specified period

Total quantity (Q_T)
= 12 x 100 x 42 = 50,400 tabs

Step 4. Final quantity to be procured (PQ)

= 50,400 – 5,000 = 45,400 tabs

Step 5. Total cost for the forecast period

C_T = 45,400 x 20 = 90,800 Kyats

ANNEX III

Tentative schedule for forecasting and tender process

Budget cycle	Tender process	Forecast period
First budget cycle	Data cutoff point → 31, March Budget proposal → April Budget approval → June Tender announcement → July Contract with suppliers → August Receive commodities → September	1, October to 31, March
Second budget cycle	Data cutoff point → 30, September Budget approval → December Tender announcement → January Contract with suppliers → February Receive commodities → March	1, April to 30, September

Glossary

AMC (Average Monthly Consumption): Average consumption of items in a specified period by months

Accounting Unit: this unit describes the basic unit for pricing of items, consumption data and SOH data (E.g. Capsule, tablet, Bottle).

Consumption data of Q4 2013 to Q3 2014: this data includes all medicines and products used by hospital

Item: Generic name for medicine and items with minimal specifications including strength, units and forms. E.g. Amoxicillin 500mg Capsule: Cannula 18G, Catgut Plain 3/0

Item category: Medicines and Items are categorized according to CMSD classification. E.g. Tablet Antibiotic, injection antibiotic

Lead Time: A period of time in months, in between when an order is placed and when the products have arrived

Quantity in order (O_{NR}): Any ordered quantities but not yet received by hospital at the cutoff point

Quantity to receive from other sources (ROS): Any quantities planned to receive from any other sources during the forecasted period

Stock out (by days): it is needed to compensate the consumption not available during the stock out time

Stock on Hand (SOH): Stock on hand data at hospital main store at the cutoff point

Unit price: Price for an accounting unit. (E.g. 25 kyats/capsule: 25,000 Kyats/bottle)

VEN Status: Vital, Essential or Non-essential classified by procurement enteritis. It is used when a health care facility needs to readjust the forecast items and quantities when available budget does not match with the forecasted costs.

- Vital: those medicines are essential and lifesaving medicines and should be available in hand all the time. No adjustment should be done over forecasted items nor quantities
- Essential: those medicines requires for treatment of most common diseases. The adjustment may be done on its quantities but the entire item if the available budget is not enough for forecasted quantities.
- Non-essential: those medicines are not necessarily essential for the treatment of common diseases. Those should be procured only if the budget is enough.