

New Systems and Procedures for Drug Management at the Central Medical Stores in Windhoek, Namibia: Trip Report

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CONTENTS

ACRONYMS.....	v
INTRODUCTION	1
WORK COMPLETED	3
Analysis of Key CMS Operations.....	3
Analysis of CMS Operations for Receiving Supplies	3
Analysis of CMS Operations for Distributing Supplies	7
Development of a New Inventory Control System.....	10
Development of an Inventory Management Package Using Spreadsheets.....	16
Strengthening SYSPRO’s Capacity.....	16
Workplan.....	17
NEXT STEPS	19
CMS Stock-Taking	19
Data Collection for Inventory Management	19
Strengthen SYSPRO’s Capacity.....	20
Human Resource Needs.....	20
Creation of a New Assembly Section	20
KEY OBSERVATIONS AND RECOMMENDATIONS.....	23
Observations	23
Recommendations.....	24
ANNEX 1. Proposed Changes to SYSPRO.....	27
Formulas for CMS SYSPRO Calculations	28
System-Generated Reorder Quantity	29
Drug Management Reports.....	29

ANNEXES

Annex 1	Proposed Changes to SYSPRO
Annex 2	Purchase Order
Annex 3	Goods Received Note
Annex 4	Supplier Invoice
Annex 5	Extract Order
Annex 6	Transfer Document
Annex 7	Purchase Order Receipt Voucher
Annex 8	Delivery Note
Annex 9	Bin Card
Annex 10	Order Book (Extract)
Annex 11	Interim Order Form
Annex 12	Picking List
Annex 13	Customer Invoice
Annex 14	Schedule 7 Drug Delivery Form
Annex 15	Inventory Management Package (Printout)
Annex 16	Workplan

ACRONYMS

AMC	average monthly consumption
ARV	antiretroviral [drug]
BS	buffer stock
CMS	Central Medical Stores
DOS	days out of stock
EMC	estimated monthly consumption
F	forecast adjustment factor
GRN	Goods Received Note
IMP	Inventory Management Package
IP	inventory position
IS	issues made during period
LT	lead time
MAXSL	maximum stock level
MINSL	minimum stock level
MOHSS	Ministry of Health and Social Security
MSH	Management Sciences for Health
OP	order period
PA	Pharmacist's Assistant
PO	Purchase Order
PORV	Purchase Order Receipt Voucher
RMS	Regional Medical Store
ROQ	reorder quantity
RPM Plus	Rational Pharmaceutical Management Plus [Program]
VEN	vital, essential, and non-essential [drug classification system]

INTRODUCTION

This trip report describes the nature of the work undertaken in Namibia on January 19–29, 2004. Activities completed during this visit were focused on completing a workplan for strengthening inventory management, storekeeping and related management systems, and procedures employed at the Central Medical Stores (CMS) in Windhoek, Namibia.

This assignment was undertaken by Vimal Dias, Senior Program Associate, in close collaboration with Francis Aboagye-Nyame, Team Leader, and Andy Marsden, Information Technology Consultant; all are from the Rational Pharmaceutical Management Plus (RPM Plus) Program of Management Sciences for Health (MSH).

WORK COMPLETED

Introduction

The work undertaken during this visit included the following activities—

- Analysis of key CMS operations
- Analysis of CMS operations for receiving supplies
- Analysis of CMS operations for distributing supplies
- Development of a new inventory control system for the CMS
- Development of an Inventory Management Package using spreadsheets
- Assessment of how the capacity of SYSPRO—the computer system employed for supporting inventory management and other key related functions at the CMS—could be strengthened to meet the needs of new inventory control and related systems (see Annex 1 for proposed changes)
- Development of a draft workplan

Analysis of Key CMS Operations

A meeting attended by senior CMS staff and other key persons involved in operations was held on January 21, 2004, at the CMS to discuss how key operations—such as procurement, receiving, storekeeping, and dispatching drugs and medical supplies—are currently performed at the CMS. This process mapping exercise provided an opportunity for the RPM Plus team to obtain valuable information regarding key operations, the inventory management computer system SYSPRO, and the strengths and weaknesses of current operations and systems.

For a complete account of the results of the process mapping exercise, see Andrew Marsden's trip report.¹

Analysis of CMS Operations for Receiving Supplies

Current systems and procedures employed for receiving new supplies at the CMS Receiving Section were analyzed. This involved a study of key operations, analysis of documents used in connection with receiving supplies, analysis of SYSPRO use, and interviews with key staff members involved in these operations.

Procedure for Receiving Supplies

This section presents 10 important activities and procedures performed from the time a new order is initiated by the CMS Procurement Section until the supplies are received at the CMS and taken to individual warehouses.

¹ Marsden, A. 2003. *SYSPRO Systems Audit: Central Medical Stores, Windhoek, Namibia*. Submitted to the U.S. Agency for International Development by the Rational Pharmaceutical Management Plus Program. Arlington, VA: Management Sciences for Health.

1. *Activity:* Raise a Purchase Order (PO)

The Procurement Pharmacist prepares a procurement requisition once a week using an Excel spreadsheet to identify products needing reorder and reorder quantities. This document is amended if necessary and approved by the Distribution Pharmacist before procurement is initiated.

New orders are initiated by the CMS Procurement Section using SYSPRO, which prints a PO in four copies on preprinted paper. Each PO contains only one item. The blue copy is forwarded to the supplier, and the other three copies (red, green, and black) are forwarded to the CMS Receiving Section when the order is placed.

Performed by: Procurement Pharmacist

Documents used/generated: PO and Goods Received Note (GRN) produced by SYSPRO (see Annex 2 for a specimen of a PO and Annex 3 for a specimen of a GRN)

2. *Activity:* Receive supplies

When a new consignment of drugs arrives at the CMS Receiving Bay, it is checked against the PO, GRN, and Supplier Invoice.

Performed by: Clerk or Pharmacist's Assistant (PA)

Documents used/generated: PO, GRN, and Supplier Invoice (see Annex 4 for a sample supplier invoice)

3. *Activity:* Update GRN and check for undelivered quantity

After inspection, the quantity received is entered by hand into the GRN in the box marked "Quantity Received" and any undelivered quantity (if any) in the box labeled "To Follow." A GRN is filled in for each product; if multiple batches of the same product are received, each batch is given a separate GRN.

If there is a balance quantity still to be delivered against a PO, the Receiving Section would notify the Procurement Clerk. The Procurement Clerk would print an Extract Order in triplicate (red, green, and black) for the outstanding order quantity. See Annex 5 for a specimen of an Extract Order. These documents carry the same PO number but are not signed by the Procurement Pharmacist.

Performed by: Clerk or PA

Documents used/generated: GRN, Extract Order

4. *Activity:* Print a Transfer Document

A Transfer Document for each item is printed using SYSPRO at the Receiving Section. SYSPRO will put the quantity received as "Quantity Under Inspection."

Information found in the Transfer Document is somewhat similar to the information contained in a GRN. This document certifies that the consignment received has been transferred to a warehouse.

For non-drug products a numbered Purchase Order Receipt Voucher (PORV) is printed. Information contained in the PORV is similar to information in the GRN.

Performed by: The Transfer Document is printed by a Clerk or a PA and signed and dated by the Warehouse Clerk or PA.

Documents used/generated: Transfer Document (Annex 6), PORV (Annex 7)

5. *Activity:* Collate receiving documents

Collate a complete set of receiving documents pertaining to the product and file the set in one of nine trays at the Receiving Office maintained for each of the nine warehouses.

Performed by: Clerk or PA

Document used/generated: GRN (red, green, and black copies), Transfer Document, Supplier Invoice, waybill, Delivery Note (see Annex 8 for a specimen of a Delivery Note)

6. *Activity:* Check and accept goods

Warehouse staff will check the document trays each morning and process documents as needed. Products are checked for identity and correct quantity by a Warehouse Clerk in order to finalize the GRN.

Performed by: Warehouse Clerk

7. *Activity:* Transfer goods and documents

The Warehouse Clerk enters the product information in the Order Controlling System Register and then moves the documents and products to the appropriate warehouse. Small items are moved by a trolley and heavy items by a pallet truck.

Performed by: A Warehouse Clerk enters information in the register; supplies are moved to the warehouse by a worker.

Document used/generated: Order Controlling System Register

8. *Activity:* Store product in correct bin location and update stock balance on Bin Card

Once a product reaches a particular warehouse, the stock on hand is checked against the Bin Card balance. Then the product is placed in the appropriate bin location and the Bin Card balance is updated.

Performed by: Warehouse Clerk and workers

Document used/generated: Bin Card (see Annex 9 for a specimen of a Bin Card)

9. *Activity:* Update SYSPRO stock balance

When fresh supplies received are added to the stock on hand, SYSPRO will debit the amount listed as “Quantity Under Inspection” and credit the stock on hand.

Performed by: Warehouse Clerk

10. *Activity*: Process documents

The Warehouse Clerk returns all documents to the Receiving Section, and the Receiving Section Clerk enters information and signs the Order Controlling System Register to acknowledge receipt of documents.

The Receiving Section sends the red copy of the GRN to the Filing Office/CMS Archives, while the green and black copies are sent together with all other documents to the Accounting Office, which makes supplier payments.

In case of a partial shipment, the quantity outstanding (yet to be delivered) is entered in the GRN and the red copy is sent to the Procurement Clerk to initiate procurement for the missing quantity.

Performed by: Procurement Clerk or PA

Documents used/generated: GRN (red, green, and black copies), Transfer Document, Supplier Invoice, waybill, Delivery Note, and Order Controlling System Register

Observations

- The Procurement Section does not receive copies of the GRNs. The Procurement Section obtains information on what has been received through the two following SYSPRO reports—
 - ◊ The Goods in Inspection Report gives information on shipments that have not been transferred to the warehouse or were not accepted at the warehouse but for which GRNs have been made.
 - ◊ The Daily Receipts Report includes goods that have been inspected and goods that have been accepted at the warehouse.
- The Receiving Section does not keep a copy of the GRN.
- Purchase Orders and GRNs contain information relating to only one product. In the case of GRNs, SYSPRO cannot print information about multiple batches received of a given drug.
- The POs and GRNs are printed when an order is initiated. Quantity received and quantity yet to be received (if any) is entered manually onto the GRN after goods are received.

List of Key Receiving Documents

1. Purchase Order
2. GRN (produced by SYSPRO in three copies)
3. Supplier Invoice
4. Extract Order (produced by SYSPRO in three copies)
5. Transfer Document (produced by SYSPRO)
6. Purchase Order Receipt Voucher (produced by SYSPRO)
7. Delivery Note
8. Bin Card
9. Order Controlling System Register

Analysis of CMS Operations for Distributing Supplies

Current systems and procedures employed to issue supplies from individual CMS warehouses, transfer them to the Dispatch Section, assemble them for distribution, and transport them to customers were analyzed in detail. This involved a study of key operations, analysis of documents used in connection with issuing of supplies, analysis of SYSPRO use, and interviews with key staff members involved in these operations.

Procedure for Issuing and Distributing CMS Supplies

The 13 steps and procedures described in this section are currently followed at the CMS for issuing products to fill customer orders.

1. *Activity:* Place customer orders

Customers are usually expected to place orders every six weeks using an “Order Book” (Green Book) containing preprinted product names. See Annex 10 for a specimen page from the Order Book. For placing emergency orders between scheduled ordering times, an Interim Order Form is used (see Annex 11).

Performed by: Individual customers

Document used/generated: Order Book, Interim Order Form

2. *Activity:* Obtain approval of orders

Order Books are forwarded to a supervisor for review and approval of customer orders.

Performed by: Distribution Pharmacist

Document used/generated: Order Book

3. *Activity:* Enter order information into SYSPRO and provide a unique order number

Performed by: Order Typist

4. *Activity:* Print Picking Lists

Produce a Picking List for each warehouse using SYSPRO. This activity will assign the quantity appearing in the Picking List to be put down as “Allocated Stock” in SYSPRO (the stock on hand in SYSPRO will not get reduced).

Performed by: Records Clerk

Document used/generated: Warehouse-specific Picking Lists (see Annex 12)

5. *Activity:* Check Picking Lists and make amendments

The Picking Lists and Order Book are checked by a supervisor and missing items (if any) are added.

Performed by: PA

Document used/generated: Picking Lists and Order Book

6. *Activity:* Pick products and update stock balances

A Pharmacist's Assistant will take the Picking List to the relevant Warehouse Clerk. This clerk will pick items according to the Picking List and adjust the stock balances on the Bin Card accordingly. Picked items are put into boxes if they are small or loaded onto a pallet truck if bulky.

Performed by: Warehouse Clerk and workers

Document used/generated: Bin Card and Picking List

7. *Activity:* Check picked items

After all items are picked, they are checked for identity and quantity. Only then are Warehouse Clerks expected to seal boxes. However, this activity is not performed in the presence of the supervisor.

Performed by: A Pharmacist's Assistant or a Chief Clerk. These persons supervise all warehouses and are not assigned to a particular warehouse or warehouses.

8. *Activity:* Seal boxes and transfer

After boxes are sealed by the Warehouse Clerks, boxes and bulky items are moved by trolley (for light items) and pallet truck (for heavy items) to the Dispatch Bay. For very heavy items, a petrol-operated forklift truck may be used.

Performed by: Warehouse Clerks and workers

9. *Activity:* Assemble products

Products from different warehouses contained in a particular order are brought to a single location at the dispatch area. Boxes are color-coded using colored tape. Green tape represents security items that are small but expensive, red represents a controlled item, and blue represents an item that requires refrigeration. Most boxes shipped do not carry any color codes.

Performed by: Workers supervised by a Chief Clerk

10. *Activity:* Update Dispatch Log Book

In the Dispatch Log Book, a Dispatch Clerk enters the customer name, date, person responsible for bringing the goods, and number of boxes. The Dispatch Officer signs the Dispatch Log Book. A separate log book is maintained for each warehouse.

Performed by: Dispatch Clerk, Dispatch Officer

Document used/generated: Dispatch Log Book

11. *Activity:* Create and send Customer Invoices

The Order Book and all Picking Lists are forwarded to the Dispatch Clerk to produce a Customer Invoice using SYSPRO. Invoices are produced in duplicate; the original is sent with goods to the

customer, and a copy is filed at the CMS Archives. The invoice lists all items ordered that are available for issue at the CMS.

Once invoicing is completed, SYSPRO credits the quantity under “Allocated Stock” and debits the stock on hand. Accordingly, the SYSPRO stock on hand is reduced by the quantity issued.

Performed by: Dispatch Clerk

Document used/generated: Customer Invoice (see Annex 13)

12. *Activity:* Return documents to customer

The Dispatch Section will send relevant documents to the customer along with the goods.

Performed by: CMS Driver

Document used/generated: Order Book, Customer Invoice, and Picking Lists

13. *Activity:* Load goods onto trucks

Last, products are loaded onto trucks according to a distribution schedule. Six distribution routes are served by the CMS. No nets are currently used in CMS trucks to demarcate different shipments assigned to different customers; this lack of nets increases the risk of consignments getting mixed up in transit.

Before departure, the Schedule 7 Drug Delivery List Form should be filled out. Before departing the CMS, truck doors are sealed using a device carrying a unique number. This seal is to be broken only by the next customer located on the distribution route and resealed after.

Performed by: Workers are expected to load trucks, but PAs and clerks also undertake this task. This work is supervised by a Chief Clerk.

Documents used/generated: Schedule 7 Drug Delivery List form (Annex 14), Delivery Book

Observations

1. While awaiting delivery, goods consigned to a particular customer are kept at a particular location within the dispatch area. This area is currently unsecured. Five types of goods are stored here—
 - Bulky items loaded on pallets
 - Boxes containing only one item
 - Mixed boxes containing small amounts of different items
 - Unboxed single items such as large bottles containing liquids and other bulky packages
 - Controlled items are drawn from warehouses just before the truck leaves the CMS (e.g., antiretrovirals [ARVs], controlled items, and refrigerated items)
2. Consignments destined for different customers are not separated by a net while trucks are loaded, which could cause mix-ups at unloading points.

List of Key Issuing Documents

- Bin Card
- Order Book (contains preprinted product names)
- Interim Order Form
- Picking List (produced by SYSPRO)
- Customer Invoice (produced by SYSPRO)
- Schedule 7 Drug Delivery List Form
- Dispatch Log Book (one per warehouse)
- Delivery Book (one per truck)

Development of a New Inventory Control System

There are several weaknesses associated with the current inventory control system used at the CMS. Some of these weaknesses were highlighted in the pharmaceutical sector assessment report undertaken by the RPM Plus team in November 2003.² Key weaknesses of the current system are again summarized below.

- It appears that values used by the CMS for stock on hand and on order are very unreliable. This is not a fault of SYSPRO, but rather is a reflection of poor storekeeping practices.
- Routine decisions about when to order and how much to order should be formalized and strengthened. For example, values used for maximum stock levels are set across the board at six months of the expected monthly usage for all products in stock irrespective of the nature of the product.
- The basis for setting maximum and minimum stock levels is unclear because weightings assigned to consumption during lead time, buffer stock levels, and review periods are undefined.
- Maximum stock levels and reorder levels fluctuate continuously in SYSPRO because these control parameters are dependent on issues made from the CMS over the previous 12 months.
- Product classification systems such as ABC value analysis, VEN (vital, essential, and non-essential) analysis, and Level of Use for setting inventory control parameters are lacking.
- Proper policies and systems for determining buffer stocks at the national, regional, and health facility levels are lacking.
- Systems for estimating drug needs are weak.

² Aboagye-Nyame, F., L. Akhlaghi, and V. Dias. 2004. *Assessment of the Public Sector Pharmaceutical Supply System of Namibia, November 2003*. Submitted to the U.S. Agency for International Development by the Rational Pharmaceutical Management Plus Program. Arlington, VA: Management Sciences for Health.

- SYSPRO is unable to calculate the value of an order based on the current contract price of an item needing reorder. To overcome this problem, SYSPRO inventory data is entered into an Excel spreadsheet containing product unit prices, but this requires additional work.
- SYSPRO needs to be strengthened.

Key Features of Proposed Systems

The above issues have been taken into consideration in developing the new inventory control system for the CMS. This section briefly describes key operating characteristics of proposed systems for the CMS for procurement, inventory control, distribution, and related functions associated with the management of public sector drug supplies in Namibia.

The proposed systems cover three levels—namely, the CMS at Windhoek, the two Regional Medical Stores (RMSs) at Rundu and Oshakati, and health facilities. No attempt has been made to describe current systems and procedures used at all three levels of the drug logistics system, as these have been already described in the trip report of the assessment undertaken in Namibia by MSH in November 2003.

The inventory control systems proposed for use at the CMS have been thoroughly discussed and agreed upon with CMS senior staff.

At the CMS

Inventory Control

Key Function: When to order

Method: A continuous review system, a periodic review system, or a mix of both systems could be employed for controlling drug inventories at the CMS. Due to a severe shortage of staff at the CMS and rather long and variable lead times associated with drug procurement, it is recommended that a periodic review system of inventory control be used. It would be advisable to keep the review period short, around two months, which would provide an opportunity to place orders six times a year. Accordingly, the inventory position (IP) of individual drugs should be reviewed on the first day of every other month (January, March, May, etc.).

Key Function: How much to order

Method: It would be useful for the CMS inventory control system to use two control levels, namely a minimum stock level (MINSL) and a maximum stock level (MAXSL). The IP of any product in stock should be reviewed at each review period and an order initiated only if the IP is less than the MINSL.

IP = Stock on Hand + Stock on Order (unless a system of back orders is used)

MINSL = Estimated Monthly Consumption × (Lead Time in Months + Review Period in Months + Buffer Stock in Months)

MAXSL = Estimated Monthly Consumption × (Lead Time in Months + Order Period³ in Months + Buffer Stock⁴ in Months)

The reorder quantity (ROQ), that is, the quantity to purchase, is the difference between the MAXSL and the IP at the time of review.

ROQ = MAXSL – IP

The MAXSL is a function of the order period (OP) in months. The OP should be based on the most recent ABC value analysis performed to determine the value of annual CMS issues and other factors. The following values are suggested for setting the OP—

- For Class A products, OP = 4 months' worth of needs (ordering smaller quantities of expensive Class A drugs will ease CMS liquidity and help lower the average value of stocks held in inventory)
- For Class B products, OP = 6 months' worth of needs
- For Class C products, OP = 12 months' worth of needs

Similarly, buffer stocks should be set based on a VEN analysis. The following levels are suggested—

- For Class V (vital) products, buffer stocks = 3 months' worth of needs
- For Class E (essential) products, buffer stocks = 1 month's worth of needs
- For Class N (non-essential) products, buffer stocks = 0 months' worth of needs

The above values have been provided only for illustrative purposes. Actual buffer stock levels and OPs need to be set on a case-by-case basis for individual products in consultation with CMS staff after taking into account other factors, such as space required for storage.

In practice, it will be useful to have two sets of MAXSLs and MINSLS for each product (e.g., MAXSL1, MAXSL2, MINSL1, and MINSL2). The first will be a value set by the CMS and/or an external source, while the second would be calculated by SYSPRO using the above formulas. The first set of values will have the ability to override what has been set by SYSPRO and will be used for controlling inventories.

Key Function: At any of the specific inventory review times, prepare an aggregate list of drugs that should be reordered and their corresponding order quantities.

³ Set at 3, 6, or 12 according to ABC value analysis.

⁴ Set at 3, 1, or 0 according to VEN analysis.

Method: Use SYSPRO to produce a report containing the drug code, drug name, reorder quantity, expected procurement value of individual items to be ordered, and total value of all products needing reorder.

Information required for calculating inventory control levels should be entered into the SYSPRO product database and updated regularly to reflect current operating conditions. Accordingly, SYSPRO should automatically calculate the MAXSL2 and MINSL2 and display these in the product screen.

Classification Systems

Key Function: To classify drugs according to certain classification systems

Method: All drugs are not of equal importance, and hence it is necessary to classify drugs according to certain attributes to ensure their proper management. It is suggested that drugs be classified according to the three following methods using a three-digit code in the SYSPRO product database.

1. The first digit signifies the class of product according to ABC value analysis, based on annual value of issues made by the CMS.
2. The second digit signifies the class of product according to VEN analysis.
3. The third digit signifies the class of product according to Level of Use.

For example, a code such as AV1 will signify that it is a Class A drug from a financial perspective; a Class V drug from a therapeutic perspective; and recommended for use only at Level 1, the highest level of the health delivery system.

At the Regional Medical Stores

Inventory Control

Key Function: When to order

Method: It is suggested that initially a pull system employing a periodic review system of inventory control be employed at the Rundu and Oshakati RMSs. This system would enable the limited and aged fleet of trucks to be maintained as efficiently as possible.

The review period should be kept short (1.5 months), providing an RMS the opportunity to place orders eight times a year. If ordering systems are used properly, the incidence of placing emergency orders should significantly decline, thus reducing the need for costly unscheduled deliveries. Accordingly, the IP of individual drugs should be reviewed only on days specified for this purpose.

Key Function: How much to order

Method: The RMS inventory control system should probably use only one control level, namely a MAXSL. The IP of a product in stock should be reviewed at each of the review periods and an order initiated to make up the difference, if any, between the MAXSL and the current IP of the product.

The use of a second control level similar to that proposed for the CMS would need to be reviewed after visiting the RMS and taking into account policies regarding buffer stocks at the regional level as well as other factors.

IP = Stock on Hand + Stock on Order

MAXSL = Estimated (Average) Monthly Consumption × (Lead Time in Months + Review Period in Months + Buffer Stocks)

Buffer stocks could be allocated to cover two months' worth of needs for Class V products and one month's worth for Class E products; no buffer stocks need to be held for Class N products. However, if storage capacity is a problem at the CMS in Windhoek, buffer stocks at the two RMSs could be increased.

Unlike at the CMS, which orders products from external sources, the lead time for the RMSs (which order from the CMS) is much shorter and should remain at two weeks.

The ROQ is the difference between the MAXSL and the current IP at the time of review.

ROQ = MAXSL – IP

The above values have been provided only for illustrative purposes. Actual buffer stock levels need to be set after the policy on setting national, regional, and health facility buffer stocks and service levels is discussed with the Ministry of Health and Social Security (MOHSS) and CMS staff.

Information required for calculating the inventory control levels should be entered into SYSPRO product databases and updated regularly to reflect current operating conditions. Accordingly, SYSPRO should automatically calculate the MINSL1 and MAXSL1 and display this value in the product screen.

Key Function: At any of the eight times specified for reviewing inventory, Prepare an aggregate list of drugs needing reorder and their corresponding order quantities.

Method: Use SYSPRO to produce a report containing the drug code, drug name, reorder quantity, value of individual products needing reorder, and total value of the drug order to be received from the CMS.

Key Function: Based on products needing reorder, prepare drug requisitions to be sent to the CMS.

Method: Use SYSPRO to produce drug requisitions.

At Health Facilities

Inventory Control

Some hospitals and health centers order drugs directly from the CMS in Windhoek. Other hospitals and health centers order from the two RMSs. Clinics receive drugs from a local hospital.

It may not be possible to introduce computerized inventory control and ordering systems at any of these levels in the short run. Any new systems to be introduced should be very simple and operated manually.

Key Function: When to order

Method: It is suggested that a pull system that employs a periodic review system of inventory control be used at the health facility level.

The review period would vary from a day to a month, depending on the type of facility. The lead time would also vary accordingly. Inventory positions of individual drugs should be reviewed on days specified for this purpose for different types of health facilities.

Key Function: How much to order

Method: A MAXSL should be established for all individual products held in stock. The IP of any product should be reviewed at the specified review times and an order initiated to make up the difference, if any, between the MAXSL and the current IP of the product.

IP = Stock on Hand + Stock on Order

MAXSL = Estimated (Average) Daily Consumption × (Lead Time in Days + Review Period in Days + Buffer Stocks in Days of Consumption)

Buffer stocks should be allocated at appropriate levels according to VEN analysis.

The ROQ is the difference between the MAXSL and the current IP at the time of review.

ROQ = MAXSL – IP

Key Function: Placing drug requisitions

Method: It is suggested that an appropriate ordering system using requisition issue forms be used by hospitals, health centers, and clinics. The forms currently used for this purpose should be reviewed and amended if necessary to reflect stock on hand at the time the order is placed with the CMS, an RMS, or a hospital.

It was observed that some of the clinics do not maintain any stock records. Hence, it will be important to first introduce stock cards and provide training on their proper maintenance before attempting to introduce new inventory control systems.

Development of an Inventory Management Package Using Spreadsheets

The modifications proposed for SYSPRO will take some time to be completed. It may be possible to employ a suitable spreadsheet program to make key inventory control decisions such as “when to order” and “how much to order” pending completion of amendments to SYSPRO. With this in view, a user-friendly spreadsheet program called the Inventory Management Package (IMP), which incorporates the inventory control model proposed for the CMS, was developed. A specimen output of IMP can be found in Annex 15.

IMP has the capacity to be used at any of the scheduled times recommended for reviewing CMS inventory. It can be used to identify individual products that require reorder according to the controls set by the inventory management system, as well as to determine reorder quantities, value of individual items to be ordered, and value of the total order.

IMP has the following advantages—

- Because it is a spreadsheet program, its contents and calculations are easily understood by users.
- The program is easily modified by the user to meet changing needs.
- A spreadsheet program makes it easier for users to understand how the inventory control model actually works in practice.

IMP has the potential to be a useful tool for controlling inventories; however, if the decision is made to implement IMP at the CMS, it should be done under the direct supervision of a RPM Plus staff member.

Strengthening SYSPRO’s Capacity

The types of changes that are necessary for SYSPRO have been identified in relation to new systems proposed for procurement, inventory control, quantifying drug needs, storekeeping, and related functions. These changes have been discussed and communicated to Andy Marsden, who is working to strengthen SYSPRO.

Changes recommended include additional fields for SYSPRO databases, use of formulas for setting various inventory control limits such as minimum and maximum stock levels, and greater ability to produce a range of standard management reports. These proposals are included in Annex 1.

Workplan

A draft workplan has been developed for inventory, warehouse, and human resource management at the CMS and RMSs during calendar year 2004. This workplan (see Annex 16) lists key objectives, activities, a time frame, and levels of effort for both RPM Plus and CMS staff. The workplan was discussed thoroughly with the Chief Pharmacist and the Procurement Pharmacist on January 28 and 29, 2004, and some changes were made based on their input.

NEXT STEPS

When new systems and procedures for inventory management and storekeeping practices are introduced, training and assistance in their implementation has to be provided. The CMS organizational structure would also need to be changed to support the new functions.

The workplan describes a wide range of activities to be undertaken during the current year. The following functions should be undertaken on a priority basis to provide a firm foundation for the smooth implementation of the project.

CMS Stock-Taking

Stock balances appearing in SYSPRO, Bin Cards, and physical stock do not currently match for the majority of products stored at the CMS. Hence, it is important that a physical stock-taking of the entire range of products in stock be completed as soon as possible. This task has been assigned to the accounting firm Ernst and Young and is expected to be completed in March 2004.

It is important to note that no inventory control system—be it SYSPRO, the new inventory control model proposed in this report, or any other—can work if the information entered is inaccurate. Hence, the successful completion of the physical stock count and the updating of balances in SYSPRO and Bin Cards would be of little value unless stock balances can be maintained accurately and kept up-to-date thereafter. This condition is paramount for the success of the project as a whole.

Data Collection for Inventory Management

Any inventory control system requires a large amount of data to be entered into its various databases in order to make it fully operational. Some of this data cannot yet be entered into SYSPRO without making some modifications. However, the CMS should begin to look at how information gained through ABC value analysis and VEN analysis could be gathered systematically pending the strengthening of SYSPRO.

If the IMP is to be immediately implemented as an interim measure, it would be useful to start performing ABC value analysis and VEN analysis as soon as possible. However, these analyses should be properly done, as the findings would have significant financial and therapeutic implications when utilized for making key inventory management decisions. Hence, it is recommended that this activity be performed under the guidance of an RPM Plus staff member.

Strengthen SYSPRO's Capacity

A number of additional features to be included in SYSPRO to make drug management more efficient were identified. Such changes include fields added to the product, supplier, and customer master files; use of inventory control measures; and development of standard management reports. These changes have been conveyed to Andy Marsden, the MSH Information Technology Consultant. He is expected to communicate these changes to those who would be involved in making modifications to SYSPRO.

Human Resource Needs

It is important to develop a suitable organizational structure for the CMS and RMSs to support new systems and procedures and to maintain an efficient drug management system. Key functions to be performed by different units within the CMS have been identified, and a draft organizational structure based on these needs has been presented to the Chief Pharmacist for review. This organizational structure must be further developed and finalized, staff needs assessed, and job descriptions developed in relation to proposed systems.

RPM Plus is expected to fund two new staff positions, namely, a Pharmaceutical Management Advisor and an Information Systems Associate. These persons are expected to be stationed at the CMS and to be recruited by March 2004.

In addition to staff funded through RPM Plus, it is very important that vacant positions at the CMS, especially that of the Distribution Pharmacist, be filled as soon as possible.

Creation of a New Assembly Section

At present, there is no separate section where products drawn from individual warehouses can be assembled and shipped to customers. This weakness leads to lower productivity of dispatch operations; discrepancies between physical stock balances, SYSPRO balances, and Bin Card balances in warehouses; and poor supervision of picking of drugs and their transfer to the Dispatch Section.

Hence, it is recommended that a separate Assembly Section be created for the exclusive purpose of assembling the different individual products that make up a given customer order. This proposal should also include the following—

- A secured area for storing assembled consignments awaiting delivery to customers should be set up. This would reduce the chances of different boxes getting mixed up and other losses.
- Separate staff, preferably a Pharmacist's Assistant or a Senior Clerk and two workers, should be allocated to the Assembly Section.

- Two workbenches for simultaneously assembling, checking, and sealing boxes should be built. Any other tools and equipment needed for improving productivity of the Assembly Section should also be procured.

The space available at the Dispatch Section is rather limited. Hence, the layout of workbenches, secured storage areas, corridors for movement of materials-handling equipment, and other types of work areas should be properly designed and demarcated. The workplan includes a recommendation for a feasibility study on improving the CMS layout and materials-handling operations, as well as introduction of a computerized warehouse management system. It would be best if this feasibility study could be undertaken toward the end of 2004, as that would allow sufficient time for proposed inventory control systems to be fully implemented and gain steady-state levels of operation.

KEY OBSERVATIONS AND RECOMMENDATIONS

Observations

Based on work undertaken during this visit and the assessment of CMS activities undertaken in November 2003, major observations made regarding procurement, inventory management, warehousing, and distribution are outlined below. Many of the current procedures create unnecessary paperwork, lower the productivity of CMS staff attached to the Procurement and other sections, and increase stock-holding costs.

- The Receiving Section is an integral part of the distribution function, but it is currently under the Procurement Section, not under the Distribution Section. This is contrary to standard operating procedures.
- Purchase Orders are raised through SYSPRO with one item per PO.
- POs and GRNs are both created by SYSPRO using a single set of preprinted forms when orders are initiated at the Procurement Section. When supplies are received, the quantity received is manually entered onto the GRN.
- Currently, the Procurement Section is performing many key distribution functions such as order initiation, which has created a work overload in that section.
- Similar to POs, GRNs contain information on only one product. Furthermore, different batches of the same drug are recorded on different GRNs. However, different batches are not always stored separately to enable issues based on the principle of first expiry, first out (FEFO).
- The CMS layout, with nine separate warehouses, has made it necessary to divide the Picking List into nine different lists.
- Large discrepancies are frequently observed between stock balances appearing in SYSPRO, Bin Cards, and physical stock. Poor maintenance of stock cards, posting errors, pilferage, and other malpractices could have contributed to this situation. Whatever the reasons, these discrepancies are creating serious inventory control problems at the CMS.
- The constitution of SYSPRO inventory control parameters such as maximum and minimum stock levels is unclear and varies in response to changes in product demand. This situation has created problems in managing inventories. When quantifying average consumption over the most recent 12-month period, SYSPRO in its present form does not take into account the number of days a product has been out of stock at the CMS. In addition, any other factors affecting demand cannot be considered in estimating product needs. Because of these factors, drug estimation using SYSPRO is weak.

- Layout of the CMS into nine individual warehouses for storing different types of products; poor methods employed for dispatching, warehousing, and documenting; and lack of a central Assembly Section and effective supervision has lowered productivity levels and increased the risk of stock losses. Lack of a central Assembly Section has increased the incidence of losses after packing, checking, and sealing of boxes have taken place at individual warehouses.
- There is no system of continuous stock checks at the CMS by an internal or external auditor. This has given rise to large discrepancies between physical stock, stock records, and balances generated by SYSPRO, and these discrepancies have gone unnoticed for long periods of time.
- Lack of a Distribution Pharmacist has greatly burdened the Chief Pharmacist, making it difficult for him to focus on development issues, operations planning, and monitoring and supervision of key CMS operations. Further, the lack of an internal audit at the CMS has prevented the deployment of much-needed operational and financial checks and balances.

Recommendations

Based on these key observations and other weak spots of CMS drug management systems, the following key recommendations have been made with a view to improving CMS operations.

Strengthen Inventory Control

Measures recommended for strengthening inventory management were described in the Development of a New Inventory Control System section of this report, and the workplan illustrates key activities to be undertaken. Some of these key activities are also described below.

- Start collecting information that will be needed when new inventory control systems are introduced. This would include carrying out an ABC value analysis based on the CMS value of issues, purchases, and stock on hand as part of the preparation for introducing new inventory control systems. This would also include VEN analysis on the CMS product range.
- Initiate discussions on policies on buffer stocks and service levels to be maintained at the national, regional, and health facility levels.
- After the physical stock-taking is completed, input corrected data to stock cards and SYSPRO and thereafter maintain proper stock balances through continuous stock checks and increased supervision and monitoring.

Strengthen SYSPRO to Support New Inventory Control Systems

Identify changes required in SYSPRO to support new inventory control and related systems and ensure their proper implementation. This activity is being performed by RPM Plus Information Technology Consultant Andy Marsden.

Strengthen Receiving, Dispatching, and Storing Operations

The following key interventions would be useful for improving productivity of receiving, dispatching, and warehousing operations and minimizing stock losses at the CMS. (A full package of activities needed for strengthening warehouse operations, including an improved CMS layout, will not be available until the feasibility study recommended in the workplan is completed at the end of 2004.)

- Print GRNs in three copies when supplies are received and enter the quantity received and the outstanding balance, if any, directly into SYSPRO, rather than manually as at present. Also, a GRN should be printed for each warehouse and should include all products stocked at a given warehouse. Unlike at present, issuing POs and GRNs should be treated as separate activities.
- Information contained in a GRN and in a Transfer Document is different; information such as the expiry date, batch number, and warehouse name appears on the Transfer Document but not in the GRN. It is proposed that the GRN format be modified to accommodate additional information found in the Transfer Document. That way, it would be possible to issue the Transfer Document directly to the respective warehouse to be used and then filed there. It would not be necessary to issue the full set of supplier documents to the warehouse as at present. Thus, time could be saved and copies of the GRN could be dispatched to the Accounts Section without delay.
- The issuing of a Purchase Order Receipt Voucher should be discontinued as it apparently serves no useful purpose.
- Create a centralized Assembly Section—a secured storage facility for holding supplies awaiting delivery—and employ staff as outlined in the Creation of a New Assembly Section part of this report. This practice should increase productivity of the Dispatch Section and considerably reduce stock losses.
- Make individual warehouse clerks accountable for stock losses and for maintaining proper stock balances through improved supervision and appropriate disciplinary action. This will be particularly important after Ernst and Young complete the stock-taking activity.
- Employ a system of continuous stock checks at all warehouses, focusing on high-value Class A products.

- Identify pallet trucks and other materials-handling equipment needing repair and undertake such repairs. Identify whether any new equipment is required.
- Procure and install nets in all trucks for separating consignments belonging to different customers as a means of avoiding mix-ups at unloading points.
- Once all systems and procedures have been developed, prepare operations manuals for the new systems and provide training to all concerned staff.

ANNEX 1. Proposed Changes to SYSPRO

Changes proposed for improving SYSPRO product, supplier, and customer files are described below. These changes have been communicated to Andy Marsden.

Suggested Additions to the Current SYSPRO Product Master File

It would be useful to include the following additional fields in the SYSPRO product master file—

- Issue units (e.g., tablets, capsules, pack of 12)
- Strength/size of drug or medical supplies
- Dosage form, such as tablet, capsule, suppository, cream, lotion (T/C/S/C/L)
- Product category, such as pharmaceutical, clinical supply, X-ray, other (P/C/X/O)
- Secondary product category (e.g., ARVs, PMTCT, TB, malaria)
- Standard pack size expressed in issue units
- Current supplier
- Unit product price in Namibian dollars (N\$) based on current contracted price
- Classifications made using three characters—A, B, or C for ABC value analysis; V, E, or N for VEN analysis; 1, 2, 3, 4, or 5 to denote Level of Use

Suggested Additions to the Current SYSPRO Supplier Master File

- Type of Supplier: Distributor, manufacturer, other
- Key Products: Key products offered by supplier
- Inception: Year supplier was established
- Prequalified by CMS: Yes/no
- Last Good Manufacturing Practices (GMP) Audit: month/year
- Performance Rating: A, B, or C
- Purchases Year to Date (YTD): N\$
- Purchases Made in the Past Year: N\$

Suggested Additions to the Current SYSPRO Customer Master File

- Type of Customer: Hospital, health facility, other
- Number of Beds:
- Province/Zone:

- District:
- Distance from Windhoek (kilometers):
- Markup: %
- Delivery Route:
- Physical Accessibility:
- Budget: N\$
- % of Budget Used YTD: %

Formulas for CMS SYSPRO Calculations

$$\text{MAXSL1} = \text{EMC} (\text{LT} + \text{OP} + \text{BS})$$

$$\text{EMC} = \text{AMC} \times \text{F}$$

Where: EMC = Estimated monthly consumption
LT = Lead time in months
OP = Order period in months, based on ABC value analysis and other factors
BS = Buffer stock in months of consumption, based on VEN analysis and other factors
AMC = Average monthly consumption generated by SYSPRO
F = Forecast adjustment factor⁵

$$\text{MINSL1} = \text{EMC} (\text{LT} + \text{R} + \text{BS})$$

Where: R = Inventory review period in months specified by the system

R could be fixed at two months for the CMS and 1.5 months for the two RMSs.

The average monthly consumption would be generated by SYSPRO using historical data on what has been issued from the CMS in the past. There are two options for generating this information as follows—

1. SYSPRO will ask the operator to enter the product code and dates specifying a specific period of issue. SYSPRO will then access the transaction file and sum all issues for the product, less returns (if any) for the specified period.

$$\text{AMC} = \frac{\text{IS} \times 30}{\text{N} - \text{DOS}}$$

Where: N = Number of days in selected period
DOS = Number of days item is out of stock during selected period
IS = Total issues made during the selected period

⁵ This is a percentage that will allow the computer-generated AMC to be lowered or raised depending on factors influencing product consumption. For example, F = 0.90 means a lower demand is expected, 1.25 means an increase in demand is expected, 1.00 means demand is expected to remain flat, and so on.

2. Or, SYSPRO will ask the operator to enter the product code and to specify the number of months to be considered in working out a value for the estimated monthly consumption. For example, entering 12 will make SYSPRO to analyze data going back 12 months. SYSPRO will then access the transaction file and sum all issues for the product, less returns (if any) for the specified period.

It is suggested that the value appearing on the screen for EMC should be equal to $F \times AMC$ and be calculated using either of the methods outlined above. Forecasting drug needs should be a separate activity performed periodically or as needed for a specific product, using a different forecasting menu.

System-Generated Reorder Quantity

$$ROQ = (MAXSL1 - IP)$$

Where: MAXSL1 = Maximum stock level
IP = Inventory position (Stock on hand + Stock on order)

When: $IP \leq MINSL1$

Drug Management Reports

Following are some drug management reports recommended for use at the CMS and RMS levels using SYSPRO. These standard management reports should be produced on a regular basis using SYSPRO by employing a menu-driven system for printing.

Suggested CMS Reports

- Distribution reports by country/zone/province/district for individual products by quantity and value
- Distribution reports for individual facilities/types of facility, listing individual products by quantity and value
- Information on quantity and value of shipments made from the CMS on a quarterly basis in any of the past eight quarters
- Estimate of the average monthly consumption of products over a specified number of quarters, adjusting for stock-out periods if any
- Product issue report containing the names of all facilities that have received a specific product over a given period of time, date of issue, issue value, and invoice number (this report will be useful in case of product recalls)
- Purchase Order Receipts report
- Product receipt report

- Supplier product report
- Inventory position report to provide information on quantity on hand and quantity on order of a given product or all products
- Inventory by lot and expiry report
- Report of drugs at risk of expiry
- ABC value analysis for all CMS issues or for issues to a particular facility
- VEN analysis report
- Stock return by value report
- Stock return by product report
- Out of stock report
- Slow-moving stock report
- Lead time analysis report
- GRN report
- Stock valuation report
- Estimated value of orders to be procured
- CMS performance report
- Any other reports as required

Suggested RMS Reports

- Distribution reports by zone/province/district for individual products by quantity and value
- Distribution reports for individual facilities/types of facility listing individual products by quantity and value
- Information on quantity and value of shipments made from an RMS on a quarterly basis for any of the past eight quarters
- Estimate of the average monthly consumption of products over a specified number of quarters, adjusting for stock-out periods if any
- Product issue report containing names of all facilities that have received a specific product over a given period of time, date of issue, issue value, and invoice number (this report will be useful for making any product recalls)
- Product receipt report
- Inventory position report, which provides information on quantity on hand and quantity on order of a given product or all products
- Inventory by lot and expiry report
- Drugs at risk report
- ABC value analysis for all RMS issues or for issues to a particular facility

- VEN analysis report
- Stock return by value report
- Stock return by product report
- Out of stock report
- Slow-moving stock report
- GRN report
- Stock valuation report
- RMS performance report
- Any other reports as required

Health Facility Reports

Due to the acute shortage of trained staff and lack of computer facilities at the health facility level, the number of drug management reports that could be successfully developed on a regular basis will be rather limited. Hence, it is suggested that facility reports be produced using SYSPRO operated at CMS/RMS levels, thus eliminating the need for facility-level staff to engage in this activity.

