Assessment of the Pharmaceutical Management Information and Monitoring and Evaluation Systems of the Republic of Namibia: Trip Report

Hare Ram Bhattarai

May 2004

Rational Pharmaceutical Management Plus
Center for Pharmaceutical Management
Management Sciences for Health
4301 N. Fairfax Drive, Suite 400
Arlington, VA 22203
Phone: 703-524-6575
Fax: 703-524-7898
E-mail: rpmplus@msh.org

This report was made possible through support provided by the U.S. Agency for International Development, under the terms of cooperative agreement number HRN-A-00-00-00016-00. The opinions expressed herein are those of the author(s) and do not necessarily reflect the views of the U.S. Agency for International Development.

About RPM Plus

The Rational Pharmaceutical Management Plus (RPM Plus) Program, funded by the U.S. Agency for International Development (cooperative agreement HRN-A-00-00-00016-00), works in more than 20 developing countries to provide technical assistance to strengthen drug and health commodity management systems. The program offers technical guidance and assists in strategy development and program implementation both in improving the availability of health commodities—pharmaceuticals, vaccines, supplies, and basic medical equipment—of assured quality for maternal and child health, HIV/AIDS, infectious diseases, and family planning and in promoting the appropriate use of health commodities in the public and private sectors.

Recommended Citation

Bhattarai, Hare Ram, May 2004. *Assessment of the Pharmaceutical Management Information and Monitoring and Evaluation Systems of the Republic of Namibia: Trip Report.* Submitted to the U.S. Agency for International Development by the Rational Pharmaceutical Management Plus Program. Arlington, VA: Management Sciences for Health.

Contents

Acronyms vi

Background 1
Purpose of Trip 1
Scope of Work 1

Activities 3
Findings 5
Monitoring and Evaluation System 5
Management Information System 5
Use of Information at Various Levels 6
Current Use of Information Technology and Possibilities 7
National Health Information System 8
Central Medical Store 8

Next Steps 9
Recommendations 9
M&E Plan 9
Indicators 11
Management Information System 14
Follow up Activities 17

Acronyms

AIDS	Acquired Immune Deficiency Syndrome
ART	Antiretroviral Therapy
CDC	Center for Disease Control and Prevention
CLM	Center for Leadership and Management
CMS	Central Medical Store
CPM	Center for Pharmaceutical Management
DMIS	Drug Management Information System
FHI	Family Health International
GRN	Government of the Republic of Namibia
HCW	Health Care Worker
HFMIS	Health Financial Management Information System
HIV	Human Immunodeficiency Virus
HIS	Health Information System
HMIS	Health Management Information System
KMC	Katutura Medical Center
MD	Medical Officer
M&E	Monitoring & Evaluation
MIS	Management Information System
MoHSS	Ministry of Health and Social Services
MSH	Management Sciences for Health
NDP	National Drug Policy
NGO	Non Governmental Organization
PSI	Population Services International
RPM Plus	Rational Pharmaceutical Management Plus Program
TA	Technical Assistance
TMS	Transport Management System
UNAIDS	Joint United Nations Program on HIV/AIDS
USAID	United States Agency for International Development
WHO	World Health Organization
ZDV	Zidovudine

Background

Management Sciences for Health (MSH)/Rational Pharmaceutical Management Plus (RPM Plus) Program has received funds from the United States Agency for International Development (USAID)/Washington under Prevention of Mother to Child Transmission (PMTCT) funding to assist USAID Missions, cooperating agencies and countries to assess the capacity of the local government to meet drug and other health commodity needs in support of the launch and establishment of the national PMTCT and PMTCT-Plus programs. USAID is also providing field support to RPM Plus under the President's Emergency Plan for AIDS Relief, to provide technical assistance in strengthening the pharmaceutical management systems of the Ministry of Health and Social Services (MoHSS) of Namibia, in support of the planned scale up of PMTCT and ART services, specifically working with MoHSS and the Central Medical Stores (CMS) to build capacity for logistical systems and pharmaceutical management, including but not limited to quantification, distribution channels and supply chains.

RPM Plus conducted an assessment of the pharmaceutical sector in November 2003[1]. The findings of the assessment identified monitoring, evaluation and drug management information systems as areas that needed further enquiry. Additional reviews are meant to identify constraints and challenges, from a health commodity management perspective related to introducing or expanding access to antiretroviral drugs (ARVs) and proposing options for improvements.

Purpose of Trip

The purpose of the visit by Hare Ram Bhattarai, Senior Program Associate MSH/CLM, was to study the existing management information system (MIS) and monitoring & evaluation (M&E) systems at CMS, RMS and health facilities, and find out whether the current drug information system is efficiently designed and implemented to support the monitoring and evaluation plan and provide information for management decision making.

The trip focused on discussions with the MoHSS and partner organizations, and on site observation of the current M&E and MIS. Several existing documents on the subject were also reviewed. The trip to Windhoek, Namibia coincided with that of fellow RPM Plus colleagues, Francis Aboagye-Nyame, Senior Program Associate MSH/RPM Plus, Laila Akhlaghi, Senior Program Associate MSH/RPM Plus and Mr. Vim Dias, Regional Technical Advisor MSH/CPM Plus from May 4 to 12, 2004.

Scope of Work

Conduct a review of the Drug Management Information System (DMIS) and M&E framework in place with a view of determining if the existing system;

[1] Aboagye-Nyame, Francis, Akhlaghi, Laila, Dias, Vimal, 2003. *An Assessment of the Public Sector Drug Supply System of the Republic of Namibia.* Submitted to the U.S. Agency for International Development by the Rational Pharmaceutical Management Plus Program. Arlington, VA: Management Sciences for Health

- Is appropriate to provide information to all the key users at various levels of the system;
- Is easy to collect data and compile to generate various reports for reporting to higher levels;
- Is well structured with clear documentation on data collection, processing, use, reporting and feedback functions;
- Supports strategic, program/ work planning and operational level needs and supports M&E with appropriate indicators (if they exist) for assessing progress and/or outcome of these plans;
- Is or can be integrated with the existing national Health Management Information System;
- Uses computers for increased manageability and information use;
- Can be made more efficient and effective with the use of emerging Information Technology (e.g. use of hand held computers, web based solutions etc.)

Activities

1. Participated in a discussion with RPM Plus colleagues, Francis Aboagye-Nyame, Laila Akhlaghi, Vim Dias and Dawn Pereko, in Namibia, regarding the process flow at CMS to ensure improvement in the management of drug supply.

2. Attended a meeting at CMS with Mr. Habimana, CMS Chief Pharmacist, Ms Elizabeth Kambonde, CMS Senior Accountant, Ms. Harriet Lema, Tender and Procurement Pharmacist, CMS and RPM colleagues. The process flow discussed and agreed to, by the RPM Plus team, was presented and further discussed with the CMS staff for comment and suggestion. Mr. Habimana agreed to the process flow as shown in Figure 1.

3. Attended a meeting at CMS with Impact Africa representative Mr. Digby Lorimar, CMS staff and other RPM colleagues. The process flow at CMS, as agreed upon in the prior activity, was discussed with the Impact Africa representative. It was agreed that Impact Africa will send a technical person to make the changes in the Syspro software as discussed and consented in the meeting. Impact Africa agreed to provide basic training on Syspro to the RPM Plus Information Systems Associate and the newly recruited CMS Senior Accountant, who in turn will train other relevant CMS staff. Met with Mr. Johann Jones, software programmer of Impact Africa and discussed the generation of monitoring indicators. RPM Plus will provide a list of indicators, and Vim Dias and Hare Ram have drafted the list for consideration of CMS.

4. Visited Katutura Medical Center (KMC) to see the software that had functionality for pharmaceutical management in addition to clinical management. This software is marketed by Diamond Health Services who have consented to provide the core software, free of cost to the MoHSS. However, the cost of modification, maintenance and hardware will have to be budgeted for. Diamond Health Services were working with FHI to hold a workshop to define requirements for the HIV module that the software currently does not have. RPM Plus will also take this opportunity to communicate the information requirements of the pharmaceutical sector.

5. Met with Mr. Johannes ≠Gaeseb, Acting Deputy Director of the Pharmaceutical Services Division, of the MoHSS to discuss the establishment/enhancement of M&E system for the pharmaceutical sector. He was positive to the idea and agreed to work together with RPM Plus.

6. Met with Ms. Jennie Lates who had worked in the Pharmaceutical Sector of Namibia for a number of years and had done extensive work in the monitoring and evaluation of the pharmaceutical sector. Jennie expressed interest in working with RPM Plus in the development and implementation of pharmaceutical M&E if necessary.

7. Visited Windhoek Central Hospital. Observed their inventory control, stock keeping and other drug related practices. Discussed the problem related to pharmaceutical management system with the head of the pharmacy.

8. Visited Katutura Health Center. Observed the inventory stock keeping and other drug related practices. Discussed problems related to pharmaceutical management system with the head of the pharmacy.

9. Met with Ms. Maazuu Zauana, Head: Research coordination and HMIS Unit, MoHSS. She mentioned that the HMIS was in the process of being revised. The HMIS was recently assessed by a group of consultants from Western Cape University of South Africa and a draft report is available. She requested RPM Plus to submit a list of the most essential indicators, which can be included in the revised HMIS. The current HMIS does not have any pharmaceutical management indicators. She also suggested representation of the pharmaceutical sector on the HMIS working group.

10. Met with Dr. Tom Kenyon, Country Director of CDC. Dr. Kenyon shared the forms CDC uses for ART and PMTCT programs. He further demonstrated the work CDC had done towards the development of an EPIInfo based ART patient tracking software. RPM Plus will collaborate with CDC to explore the possibility of integrating the CDC software with the pharmaceutical software system that may be used in the hospitals. Dr. Kenyon suggested we contact Mr. Kelly Bussell of CDC Atlanta, for technical information.

11. Reviewed 'Quantimed', a drug quantification tool that RPM Plus is developing and an ART patient drug consumption tracking software system, also under development, for use in the Kenya/Mombassa project together with other RPM Plus colleagues.

12. Met with FHI and representatives of Diamond Heath Services to discuss the software to be supplied by Diamond Health Services for use in 5 mission hospitals, at the request of FHI for the management of ART programs. Discussions focused on the pharmaceutical management capability of the software and cost ramifications. The software suppliers agreed to send a power point presentation on the functionality of the software for pharmaceutical management. They suggested RPM Plus staff visits sites in South Africa to observe the software in operation.

13. Studied materials related to information systems, specifically related to pharmaceutical management.

Findings

Monitoring and Evaluation System

A planned and documented monitoring and evaluation system does not exist. Monitoring is done through supervisory visits with standard check lists. There are two sets of check lists: one for hospitals and one for health centers. Regional pharmacists supervise the hospitals while the pharmacists from the hospitals supervise the health centers; however, guidelines are not documented. For example, it is not clear how often these supervisory visits are made and what is done after these visits.

Monitoring

- A structured routine drug monitoring system does not exist.
- Monitoring is done through irregular supervisory visits
- A Feedback mechanism is not in place
- Special surveys are conducted every 2 years to capture the current status on implementation of drug policy and stock availability

Evaluation

- Strategies and methods are not in place to conduct in-depth analysis on the causes of indicated problems and/or successes.

It is noted that nation wide sample surveys have been conducted on 'availability of medicines, 'use of medicines' and 'implementation of national drug policy' every 2 years, since 1997. Several indicators are used in the survey. While these indicators reflect the status of the drug use and other areas of drug related activities at a given point of time, it can not substitute the regular monitoring. Data needs to be collected on a regular basis. For example, it is essential to know the drug availability situation more frequently than every two years, so that corrective measures can be taken in time.

Management Information System

Data on drug consumption and stock position is not collected regularly at the service centers (Health Centers and Hospitals). This may have serious consequences on the rational use of medicines, quantification and availability of medicines at the health facilities, and this can be attributed to the lack of pharmacists at the service centers.

Supervisory check lists are used to capture the status of drug stocks and other related activities and requirements like storage, expiry etc. The supervisory visits are, however, not regular and there is no mechanism for feedback and the specific guidelines to follow after such visits.

- Service centers do not record/report on drug consumption and stock position
- Supervisory visits are irregular and do not have documented guidelines
- Regular HIS (Health Information System) does not include drug indicator except the periodic calculation of cost and human resources related ratios.
- Sample survey is conducted every 2 years to calculate drug indicators
- Service centers (hospitals and health centers) are not computerized

The regular Health Information System (HIS) does not collect any data on medicines. Periodically the HIS calculates indicators and publishes reports. The last report published, 'Essential Indicator Report', was based on 2001-2002 data. the report listed two indictors related to availability of pharmacists and drug financing[2].

Sample surveys are also used by the pharmaceutical services division to collect data and calculate indicators, mainly related to drug use and implementation of drug policies in the country. The most recent survey was conducted in 2002. The survey calculated a number of indicators, however, it did not evaluate the processes, nor conduct an in-depth analysis of the causes of identified problems.

Use of Information at Various Levels

Health centers do not collect data on drug consumption and stock position on a regular basis, thus they do not have information to refer to for decision making. Quantification is carried out, based on the set maximum and minimum levels, instead of the consumption trend. This has led to frequent problems of medicines stock out at the facilities. Though the availability of medicines is reported to be good[3], it is essential to ensure that this is the case at all times, and not only at the time of survey. During our visit to Windhoek General Hospital we were told that there are frequent stock outs and on several occasions, the quantities of pharmaceuticals requested by the hospitals is not met by CMS due stock outs at CMS. A quick check of the last order the hospital made to CMS, revealed that about 20% of the ordered items were not supplied due to stock out at CMS.

- Service centers do not have information they need for quantification and to maintain stock position
- Higher levels have drug related information based on
  - Irregular supervisory visits
  - Sample surveys (every two years)
- CMS/RMS do not produce management indicators on regular basis
- Lack of actual consumption data from the service centers forces the belief that whatever is distributed is consumed

Since stock position and consumption data is not collected routinely at the health centers, there is no aggregate data available at the higher levels of the organization to make timely management and policy decisions. Whatever information is available is collected through supervisory visits and periodic national surveys. While this information, if properly processed and analyzed, will help understand the situation, it can not ensure continuous supply and rational use of medicines.

[2] Population per pharmacist and per capita expenditures on pharmaceuticals

[3] % of key items in stock (at the time of survey) =93% in 2001, Third National Survey on the Use of Drugs in Namibia's Public Health Institutions conducted by MoHSS, Republic of Namibia

Current Use of Information Technology and Possibilities

The CMS uses a computerized inventory management and accounting system, Syspro™ 6.0 supplied and maintained by Impact Africa, a South African firm. Its strength and weakness has been previously studied by RPM Plus and recommendations for its improvement is separately documented. Efforts are underway to effect the changes in the software to accomodate the improved work flow proposed by RPM Plus and agreed to by CMS and Impact Africa. There are plans to roll out Syspro™ to the two Regional Medical Stores (RMS) and also, setup a possible electronic linkage with the CMS system.

- CMS is computerized
- RMS are also expected to be computerized and electronically connected to CMS
- Hospitals and Health Centers are not computerized
- CDC, FHI and RPM Plus are helping to automate the service centers
- Namibia does have comparatively better infrastructures for computerization

While some of health centers may be using computers for various applications, it is understood that none of the hospitals and health centers are using a comprehensive system that includes drug management. CDC is working closely with the HMIS and Research unit of MoHSS to computerize ART patient records and tracking systems. CDC has already developed a system using EpiInfo. It does not, however, include drug management components.

FHI is exploring a 'private - public partnership' collaboration with Diamond Heath Services to introduce a computerized patient management system in the mission facilities. Under this scheme, Diamond Health Services will provide the core module free of cost, while FHI pays for the configurarion of the software to include ART services. RPM Plus is also exploring the possibility of further extending the program to include the requirements from a pharmaceutical point of view. The software was demonstrated to RPM Plus staff at one of the private clinics at Windhoek. Though the software could not be judged in full, because it was not running in real settings, it appeared to have potential to be used in a pharmacy. It was deemed appropriate to have an onsite demonstration and Diamond Health Services has proposed one of the sites in South Africa for live demonstration. A joint workshop to define the requirements of the proposed ART system will be held at the end of June 2004. The development work is expected to follow immediately. This initiative is taken as a very positive step in private-public partnership and will facilitate the comparison of services across private and public sector services.

CDC indicated that CAREWARE, developed by HSS and modified for use in Uganda, may be another candidate for ART patient care application. CDC will provide 40 computer sets, and also hire data entry operators for the MoHSS. CDC will also provide human resources for HIS.

Pharmacists are in short supply in Namibia. A 2000-2001 survey showed that Omusati and Ohangwena regions had a pharmacist-to-population ratio of 1:228,364 and 1:227,728 respectively with other regions being a bit better. Currently most pharmacy posts are vacant or are temporarily filled by foreign workers or volunteers. Namibia, on the other hand, is one of the few countries in Africa, which enjoys a comparatively good economy and has the physical infrastructure to make computerization viable. Potential use of handheld computers at the facility levels and for monitoring and supervision can be explored, as this will save a lot of time for pharmacists.

National Health Information System

Health Information System is structured as a sub-system of HMIS (Health Management Information System). HMIS includes many other modules as HFMIS (Health Financial Management System), TMS (Transport Management System) etc. There is a mechanism of collecting data at the service center. The information is compiled at the district or regional level and finally at the national level. There are HIS positions at each of the 13 regions but only 3 of these positions are filled. Each district and region have computing facilities.

- HIS is severely under staffed. Only 3 out of 13 regional HIS positions are filled
- There are adequate computing facilities, but more training is needed
- HIS does not include pharmacy information
- HIS is under review by a team of external consultants
- HIS management advised to include one focal person from pharmaceutical sector in the HIS committee
- HIS management has asked to suggest one or two key indicators to include in the regular HIS

Data related to pharmaceutical activities is not captured in the HIS. Though HIS includes an excessive number of indicators, it does not have pharmacy indicators. HIS management has advised the pharmaceutical services division to nominate one person to represent pharmaceutical matters on the HMIS committee. HMIS unit has requested one or two essential indicators to be included in the regular HIS system.

Central Medical Store

An assessment of CMS has been conducted by RPM Plus. Efforts are underway to implement changes based on the recommendations of the assessment. From the information flow perspective, a structured system to collect data, generate information and manage data flow among service centers does not exist for RMS and CMS.

- There is no structured system to collect data, generate information and manage data flow among service centers, RMS and CMS

Next Steps

Recommendations

M&E Plan

The following plan for monitoring and evaluation of pharmaceutical services is recommended. Activities related to M&E are shown vertically, while a time period with weekly intervals, is displayed horizontally. A five year time frame is used in the following illustration.

Yearly evaluation/ review																					◊							◊
Supervisory/ Inspection Visits												□					□					□						□
Monthly Activity monitoring				o								o					o											o
Weekly Activity Monitoring	√	√	√	√	√	√	√	√	√	√	√	√		√	√	√	√		√	√	√	√		√	√	√	√
↑ Process Time →	Weeks	1	2	3	4	1	2	3	4	1	2	3	4	..	1	2	3	4	..	1	2	3	4	..	1	2	3	4
	Months	1				2				3					6					12					60			

Weekly Activity monitoring: The Pharmacist at the facility will monitor weekly activities. A user-friendly format is to be developed, that ensure the use of a minimum amount of their time. This format will guide the pharmacist to monitor weekly consumption of the medicines, stock position and other issues related to pharmaceutical services. This format will contain data that can be used for quantification and ordering. This activity takes place every week as indicated by "√" in each of the weekly columns.

Monthly Activity Monitoring: The Pharmacist at the facility will prepare a simple monthly report. Preparation of this report should take a minimal amount of the pharmacist's time. This report and other relevant weekly monitoring reports will be shared with the health center in-charge. Furthermore, the pharmacist will discuss ways to solve problems identified. Part of this report is sent to district HIS office and the other part is sent to the RMS/CMS as appropriate.

Supervisory/Inspection Visits: At the end of each quarter, regional supervisors will visit all the facilities under their responsibility. A standard check list will be used to make the assessment. The Pharmacist and other related health center staff will also be involved in the process. A short feedback report will be compiled by the supervisor, based on the result of the assessment, and sent to the respective health centers. Regional pharmacists in collaboration with the regional HIS office will calculate the indicators.

Inspection visits are different from the supervisory visits. Inspection visits exist to evaluate the drug outlets' conformity to the rules and requirements set by the drug controlling and regulating authority. A separate checklist is to be developed for this purpose. Reports are prepared and sent to the drug control authorities.

Yearly Evaluation: On an annual basis, an analysis of the monitoring results during the past year will be made to find out the problem areas. One or two problem areas will then be chosen on priority basis. An in-depth analysis will then be compiled to find the reasons leading to the problem. Finally, a list of recommendations for improving pharmaceutical services will be developed. For example, if availability of a medicine is a problem, an extensive evaluation of the process of medicine supply will be made, listing recommendations for improvement.

Indicators

Indicators related to pharmaceutical services at the facilities

Primary data is collected by the health center on a routine basis or though supervisory visits. One indicator (Sr. No 4 in bold) is captured through HMIS formats. The HMIS data collection format needs to be modified to collect data to calculate this indicator more accurately. This indicator is calculated at district, regional and national level as thought appropriate by HMIS management.

Indicator: Table 1

Sr. No	Indicators	Calculation Level/Frequency[4]						
		Freq	Fac	Dis	Reg	Nat	RMS	CMS
Drug Availability and Stock Management								
1.	Quantity of essential medicines received, consumed, expired, lost and remaining balance (Data source: Bin cards, Drug dispensing register)	Mon	√					
		Qtr					√	
		HY						√
		AN						
2.	Number of months the current stock of unexpired essential medicine by type will be sufficient to provide services based in the consumption during the last quarter. (Data source: Bin cards)	Mon	√					
		Qtr						
		HY						
		AN						
3.	Number of days that essential medicines by type was out of stock (Data source: Bin cards)	Mon	√					
		Qtr						
		HY						
		AN						
4.	**% of health centers where one or more essential medicines was out of stock for 3 or more days** **(Data source: Facility Monthly Reports)** **Note: Indicator to be included in the HIS**	Mon						
		Qtr		√				
		HY			√			
		AN				√		
5.	Number of essential medicines whose physical count did exactly match the record in the bin cards. (Data source: Supervisory Checklist)	Mon						
		Qtr	√					
		HY						
		AN						
6.	% of facilities where physical count and record count is less than 5% variation (Data source: Supervisory Checklist)	Mon						
		Qtr		√				
		HY			√			
		AN						
Quality								
7.	Average number of prescriptions dispensed per day per pharmacist (Data source: Supervisory Checklist)	Mon						
		Qtr	√	√				
		HY			√			
		AN				√		
8.	% of days that the temperature of medicine refrigerator was within acceptable range (Data source: Supervisory Checklist)	Mon						
		Qtr	√					
		HY						
		AN						

[4] Mon=Monthly, Qtr=Quarterly, HY=Half-yearly, AN=Annually

Sr. No	Indicators	Calculation Level/Frequency[4]						
		Freq	Fac	Dis	Reg	Nat	RMS	CMS
9.	% of facilities that had temperature of medicine refrigerator within acceptable range for more than 90% of days (Data source: Supervisory Checklist)	Mon						
		Qtr		√	√			
		HY						
		AN						
10.	Average number of medicines per prescription (Data source: Supervisory Checklist)	Mon						
		Qtr	√					
		HY			√			
		AN				√		
11.	% prescriptions that contained antibiotics (Data source: Supervisory Checklist)	Mon						
		Qtr	√					
		HY			√			
		AN				√		
12.	% of medicines actually dispensed (Data source: Supervisory Checklist)	Mon	√					
		Qtr						
		HY			√			
		AN				√		
13.	% prescriptions that contained injections (Data source: Supervisory Checklist)	Mon						
		Qtr	√					
		HY			√			
		AN				√		
14.	% of medicines prescribed as per standard treatment guidelines (Data source: Supervisory Checklist)	Mon						
		Qtr	√					
		HY			√			
		AN				√		
15.	% of medicines prescribed as per Nemlist (Data source: Supervisory Checklist)	Mon						
		Qtr	√					
		HY			√			
		AN				√		
16.	% of medicines prescribed with generic name (Data source: Supervisory Checklist)	Mon						
		Qtr	√					
		HY			√			
		AN				√		
17.	% of medicines adequately labeled (Data source: Supervisory Checklist)	Mon						
		Qtr	√					
		HY			√			
		AN				√		
Legislation and Regulation								
18.	% of drug outlets (both private and public) inspected (Data Source: Inspection Visits)	Mon						
		Qtr			√			
		HY				√		
		AN						
19.	% of drug outlets (both private and public) in violation (Data Source: Inspection Visits)	Mon						
		Qtr			√			
		HY				√		
		AN						

Indicators Related to Drug Supply Management

Indicator Table 2 lists the indicators related to the procurement, management and supplies of medicines through Central Medical Stores and Regional Medical Stores. Since the system is expected to be computerized it is recommended that these indicators be calculated both at the regional and national level.

Indicator: Table 2

Sr	Indicator	Periodicity
Financial		
1.	Total Salary & staff benefits	Quarterly
2.	Total Vehicle maintenance & repair costs	Quarterly
3.	Total vehicle fuel costs	Quarterly
4.	All other Operating Costs	Quarterly
5.	Total CMS Operating Costs	Quarterly
6.	Total Operating Costs as a % of the value of issues	Quarterly
7.	Total Operating Costs as a % of inventory value	Quarterly
8.	Value of Accounts payable to suppliers	Quarterly
9.	Value of public drug budget spent per capita in the last year	Yearly
10.	% value of public drug budget spent by major hospitals out of value of public drug budget spent	Yearly
11.	% value of medicines purchased with international aid out of the total drug purchased	Yearly
Public Sector Procurement Procedures		
12.	Number and Value of Purchase Orders Issued	Quarterly
13.	Value of Emergency Orders as a % of all Purchase Orders Issued	Quarterly
14.	Value of stock returns to suppliers	Quarterly
15.	Average lead time (in months) for all complete orders delivered during the period by suppliers	Quarterly
16.	Number and value of GRNs issued during the period	Quarterly
17.	Value of inventory at end of the period	Quarterly
18.	Current inventory level expressed in months of consumption	Monthly
19.	% value of medicines purchased through competitive tender, out of value of medicines purchased	Yearly
20.	% Average time period of payment for orders, out of average time period of payment stated in contract	Yearly
21.	% of number of medicines/batches tested out number of medicines/batches procured	Half-yearly
22.	% of number of medicines/batches that failed quality control testing, out of number of medicines/batches tested	Yearly
Inventory management		
23.	Number of days each drug was out of stock (0 quantity)	Monthly
24.	List of medicines that did not move during the last three months	Monthly
25.	Value of all stock losses (by reasons expiry, damaged and others) as a % of value of inventory at end of period	Quarterly
26.	% of all Class V Medicines out of stock	Monthly
Distribution		
27.	Number of customer orders dispatched	Monthly
28.	Value of orders dispatched to RMS	Half-yearly
29.	Value of orders dispatched to all health facilities	Half-yearly

Sr	Indicator	Periodicity
30.	Stock returns as a % of the value of all issues.	Half-yearly
31.	% Number of customer orders dispatched on schedule out of the total orders dispatched	Half-yearly
32.	Number of non-scheduled (emergency) orders received from each of the customer	Quarterly
33.	Number of orders received up to last month by regions	Quarterly
34.	% of quantity of medicines supplied to each of the facilities out of their demand	Quarterly

Management Information System

Data collection

It is recommended that all health facilities should collect data on consumption and stock of medicines. Tools need to be developed so that minimal time is spent in data collection. The pharmacists at the service centers should be trained on how to make use of data, assess demand, track expiry dates and rational use of medicines. HIS formats for collecting information from the health centers should be modified to collect some drug related data.

Supervisory check list and questionnaires need to be reviewed to ensure adequate data is available to monitor pharmaceutical services at the health center level, and also to calculate indicators at the district, regional and national levels. Checklist for inspection of drug outlets also needs to be reviewed and standardized.

- All service centers need to collect consumption and stock data
- HIS format be modified to collect data on drug
- Data collection in electronic form need explored (e.g. use of PDA)
- Data processing should be automated where possible
- Information should be presented to facilitate easy interpretation
- Use of information at all levels should be encouraged.
- Supervisory checklist needs revision
- Inspection checklist list also needs to be developed/reviewed
- Regional pharmacists should use regional HIS facility to calculate indicators.

Use of electronic devices, such as PDAs or handheld computers, should be employed where possible. Mechanisms and procedures for data validity check should form part of the system.

Data Processing

Data processing should be done with computers, where possible. It is recommended that regional pharmacy officers should seek assistance from regional HIS offices to calculate the indicators and other information related issues.

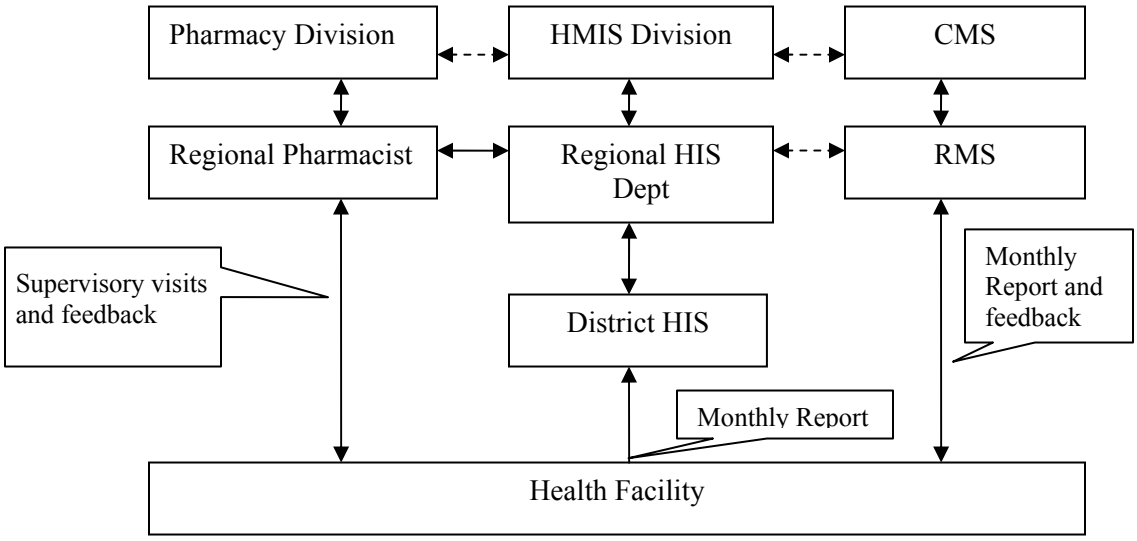
Information Presentation

Information should be presented in a way that facilitates easy interpretation and use. Use of visual mediums, such as graphs and charts, should be encouraged. If indicators are used in the report they should be clearly defined with data source and date and scope of coverage. For example, the aggregation level, assumption and conventions, if any, should be clearly mentioned.

Information Flow

There are three threads of information flow as shown in Figure 1.

Figure 1: Proposed Information Flow Scheme



Supervisory visits are made from the office of the regional pharmacists every quarter. Indicators, listed in table 1[5], are calculated and feedback is provided to the facilities on their performance. Recommendations for improvement are then made, if needed. It is suggested that regional pharmacists use the regional HIS office to calculate the indicators.

Health facilities report data on availability of medicines through the HIS structure. An indicator, of medicines out of stock, (indicator 3 from table 1) is calculated at district, regional and national level

Health facilities report data on supply, consumption, and losses due to various reasons (e.g. expiry, damage etc) to the respective RMS. RMS communicates with CMS and calculates indicators as shown in indicator table 2.

The dotted arrows depict unstructured communication between the different entities in the sense that there is no standard reporting among them. However, they can communicate at their convenience. For example, if CMS wants to publish drug supply management related indicators in the annual HIS bulletin; they can work with the national HIS department.

[5] Where the source of data is mentioned as 'supervisory checklist'

Use of Information

The principle aim of the MIS is to generate information that is accurate and reliable. Information is a resource and it will be wasted if not used. Staff at various levels need proper training on the use of information so that an information culture can be established in the organization.

- Develop tools and procedures that facilitates use of information
- Conduct periodic reviews, and discussions among peers and share information

Tools and procedures, facilitating information use, have to be provided. For example, if staff can use computers to conduct 'what if analysis', the use of information will certainly be increased. Further, periodic reviews, discussions and peer consultations are very helpful in enhancing the information culture within the organization.

Computerization

Human resource is scarce in Namibia and the basic infrastructure for computerization is reasonable in the majority of places. Computerization may help reduce the time spent by staff on data recording and report preparation.

It is recommended all hospitals be computerized. In small clinics where computerization is not possible, an efficient manual system can be deployed.

- Service centers be computerized where possible
- Computerization be done with careful planning
- Manual system must be conceptually tested before computerization
- Use of modern technology (e.g. web based applications) be explored for sharing information

Computerization needs very careful planning. Sustainability is the key issue. It is essential to ensure the availability of after sales maintenance services for both hardware and software within short notice. It is also essential to make sure the manual system is well understood and conceptually tested before it is computerized. Adequate attention also needs to be given to data security. Furthermore, it is essential to make sure the application software being employed, will be compatible with existing modules (e.g. clinical module etc.) and future modules, at the facilities.

Follow up Activities

One of the most important factors contributing to the success of an information system is how well the organization's staff comprehends the system and finds it beneficial. The best way to obtain results of the former is to allow staff to decide the structure and content of the system. It is important to educate staff on the concept of information systems before designing the system. The following activities are therefore, recommended.

- Form a task force to design pharmaceutical information system
- Organize a workshop to introduce to the concept of M&E and MIS and decide on the indicators, structure and procedure
- Help the task force design and implement system
- Help to computerize the system
- Continue TA support for at least one year

- Form a task force to design and implement the pharmaceutical management information and M&E systems
- Organize a workshop[6] to introduce pharmacists from selected hospitals, pharmaceutical services division, and staff of RMS, CMS, HMIS and representatives from other stakeholders to the concept of monitoring, evaluation and MIS. The concept presented in this report will be presented in the workshop. The objective of this workshop is to decide on indicators, the structure and procedures for the pharmaceutical information system, through a participatory process.
- The decisions made of the workshop will guide the task force to develop and implement the system.
- RPM Plus would work with the task force to assist in the design and implementation of the system.
- It would be highly desirable for RPM Plus and MoHSS staff, from the pharmaceutical services division, to visit one of the installation sites of the software, offered by Diamond Health Services, to familiarize with the operation of the system.
- RPM Plus would participate in the workshop, organized by FHI and Diamond Health Services, and put forth the information requirements of a pharmaceutical management system
- RPM Plus would continue to provide TA for at least one year to ensure that the system stabilizes and is sustainable.

[6] Workshop will be designed once the idea of organizing the workshop is agreed by all concerned parties