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Observations on the Value for Money Audit Report of March 2010 on Procurement and Storage of Drugs by Uganda's National Medical Stores

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1.   INTRODUCTION

This paper resulted from our desire to comment on and contribute to the discussion on the management of drugs and other medicals supplies at Uganda's National Medical Stores (NMS), where the said management has been identified as substandard, leading to a high level of excess stocks, shortages of critical drugs and excessive amounts of expired medicines. Regarding the NMS, the March 2010 Audit Report states the following:

> "There has been a general countrywide concern about people dying of treatable diseases such as malaria arising from patients' failure to access drugs in public health facilities while drugs worth billions of shillings remain expired in NMS facilities, stores of Referral Hospitals, District Health Offices and health units."

In this paper, observations are made on the findings and recommendations made in the Executive Summary of the Value for Money Audit Report (March 2010) on Procurement and Storage of Drugs by the NMS, prepared by the Office of the Auditor General of the Republic of Uganda. Similar findings were made in Volume 5 of the Annual Report of the Auditor General for the year ended June 30, 2009. Our observations were constrained by our inability to obtain a copy of the NMS Management Operations Manual.

The observations made below are unsolicited and totally voluntary, without any desire for present or future work. And while these observations are made in good faith and based on knowledge and experience, and the content of the report, action should not be taken on the basis of these observations without prior and comprehensive analysis of the situation. These observations represent the views of the authors and not those of any firm or organization with which the authors may be associated on a pro bono or remunerated basis.

2.   OBSERVATIONS ON THE FINDINGS OF THE AUDIT REPORT

Following are the findings of the audit with our observations below:

2.1   *NMS stocks drugs without regard to buffer stock levels; as such, certain drugs are in excess of the one year's requirement while others are under-stocked. There were huge stocks of expired drugs within the stores of NMS.*

Observations:

The cause of the anomalies in stock levels needs to be determined. Excess stocks could result from receiving unplanned supplies from third parties, poor demand analysis and forecasting, experiencing fewer demands than anticipated, excess buying, buying slow movers, etc.

Shortages, on the other hand, could result from poor forecasting and demand analysis; experiencing a surge in demand caused by a genuine demand increase, or false demand if the drug in question is a substitute for one that is out of stock. Poor replenishment planning, unreliable suppliers, buying drugs with short shelf-life, dumping of banned drugs without exploring alternative sources and suitable substitutes, etc., could also result in shortages.

Huge stocks of expired drugs in the stores could result from poor management and coordination of disposal/destruction of expired drugs, inappropriate disposal/destruction procedures, excess of short shelf-life drugs, etc.

A one year buffer stock level policy, without a proper demand analysis and forecasting, could be part of the problem with excess stocks and their subsequent expiration given short shelf life compared to amount of stock on hand and actual consumption pattern. Buffer stock level determination should be based on demand analysis which should probably include an ABC classification of the drugs based on degree of importance and/or urgency of need (for example: vital or life saving, essential, high/low demand, alternative, common), in addition to an agreed customer service level.

2.2   *Despite the requirement to destroy expired drugs after every six months after write off, there are expired drugs at both NMS premises and health centres countrywide which remain undestroyed for an average period of six (6) years.*

Observations:

This could be a sign of difficulties organizing the destruction of the drugs or that they are being kept at the health centers intentionally. This must be investigated, given the life threatening risk of these expired drugs being used knowingly or unknowing.

Proper quality control inspection in storage should be implemented, and drugs targeted for destruction identified and destruction planned to take place soon after the drugs have been written off.

Periodic inspections of a representative sample of the records and physical locations should be done to ascertain if drug destructions are being scheduled and carried out as planned.

2.3   *Although NMS is mandated to supply drugs and medical supplies to all public health services, in a number of cases, NMS does not supply drugs and medical supplies to meet public health units' needs as per their orders.*

Observations:

This could result from poor demand analysis and forecasting to ensure sufficient stocks are on hand. Also a flawed distribution strategy to ensure re-supply of public health units. This is an obvious indication that the one year replenishment stock policy is not working. A study needs to be undertaken to determine the reasons why NMS customers are irregularly supplied. Where NMS customers request drugs that are not stocked or out of stock, an alternative could be to make deliveries directly to the customer facility rather than to the NMS.

NMS customers' ordering polices could also be part of the problem.

2.4   *NMS does not maintain proper procurement plans in accordance with the stock replenishment policy and uses unreliable Average Monthly Consumption (AMC) which they do not even comply with.*

Observations:

There seems to be a bit of confusion here. A procurement plan should come after determining what to buy, how much, and when. Stock replenishment should be done by a competent inventory management specialist (IMS), not a procurement person. Procurement should be involved in source selection (where to buy and from whom), and this should be known by the IMS for the purpose of lead-time considerations when preparing the stock replenishment plan.

It needs to be determined why the average monthly consumption is considered unreliable. This depends on the source of the demand data. The best sources of demand data and how they will be captured for use in demand forecasting needs to be determined. The average monthly consumption (if available) could be effectively used to forecast future demands.

2.5   *NMS carries out needs assessments but uses data based on actual AMC sales for the previous six months which excludes customer orders that are not honored resulting in improper projections of drugs to procure.*

Observations:

Using AMC to forecast future demands could be valid, but failing to take into account lost sales due to stock out, in addition to increases in demand of substitute items due to stock out, is a serious flaw.

Rather than needs assessment, it is more accurately called demand analysis and forecasting. To be reliable, it must include:

- Actual sales minus possible substitutions (the source of false demands) issued due to stock out of other similar drugs
- Lost sales data, which is equivalent to unfulfilled demand, need to be captured in order for the data to be used in demand analysis.
- Seasonal variations must also be considered for certain drugs (those that are used to combat diseases that are seasonally prevalent, such as malaria drugs at the onset of the two peak rainy seasons (April-June and August-September).
- Shelf-life must also be considered, including order-to-receipt time.

2.6   *NMS receives, stores and distributes drugs procured by third parties but the MOUs signed by both parties lack clear terms of coordination related to joint procurement planning, leading to duplicate procurement of drugs.*

Observations:

This is also exacerbated by the one-year stock level; however, given that the nature of these third party relationships is not clear, very little can be said besides the fact that the MOUs between the parties need to address the requirement for better coordination between the parties to avoid excess supply build up, turn ins of short shelf life drugs, and the overall management of all aspects of the medical logistics chain.

Regulation 5 of the Public Procurement and Disposal of Public Assets (PPDA) Regulations 2003, provide for accreditation to use alternative procurement procedures in instances of application of International Agreements, this could be explored in NMS third party dealings to reduce duplication to a minimum; additionally, regulations 129, 136, 342 could also be helpful.

2.7   *NMS does not have a clearly spelt out policy on the standard time it should take to process a customer order from receipt to delivery at customers' District or personal collection at NMS premises. This creates no obligation for prompt processing of customer orders by NMS.*

Observations:

Priorities need to be determined and this can be done by setting customer service levels. A shipment to a customer replenishing existing stock levels is not the same as one to a customer that is out of stock. Likewise, a customer that submits a "life or death" requisition should have the highest priority. However, these examples are all considered exceptional, so a general customer service level should be set and then honored and implemented by the NMS.

The customer services level is directly related to safety stocks, which level is affected by the percentage customer service level expected to be maintained. Given that the greater the customer service level the greater the amount of stocks to be maintained, a detailed analysis needs to be undertaken to determine a reasonable customer service level.

3.   OBSERVATIONS ON THE RECOMMENDATIONS OF THE AUIDIT REPORT

Following are the recommendations of the audit with our observations:

3.1   *NMS should use appropriate data to procure the right type and quantities of drugs to meet customer requirements.*

Observations:

Appropriate data can only come from demands (past or projected), and a proper demand analysis is determined by the replenishment policy. As mentioned above, (i) actual demand data (sales, less false demands), captured from (ii) lost sales (demand for out of stock drugs), and (iii) anticipated demand due to a change in treatment policy, should be the principal source of data for determining what to buy, how much and when.

3.2   *The Management of NMS should put in place appropriate systems and develop staff capacity for collection, processing and use of appropriate data for decision-making in conducting the needs assessments.*

Observations:

Training and capacity development in Medical Logistics and Supply Chain Management are necessary; specifically, purchasing, inventory control and management, demand forecasting, quality control of drugs in storage, warehousing and storage management, disposal and destruction of drugs, and distribution.

3.3   NMS should consider opening regional centres from which customers could personally collect their individual orders. NMS should concentrate on replenishing the regional stores. This will enable NMS to be customer-focused at the regional level, while at the national level the focus will be on the replenishment of the regional centres.

Observations:

This assumes that NMS is a centralized operation. Rather than Regional Centers, which would increase cost and possibly stocks and thereby the complexity of the NMS operations (each having to do demand and stock replenishment analyses), NMS might consider creating regional transshipment points. These would not carry stock, but only orders which the NMS would send to them for reissue to its customers. NMS customers would in turn send their vehicles to pick up their orders at the transshipment point(s). A major consideration to bear in mind is how to monitor and control deliveries from the NMS, to the transshipment point, and the re-issue from the transshipment point to the ultimate customer's receiving and inspection point.

Alternatively NMS could enhance or outsource their transportation capability, bearing in mind Uganda's geographically small country size, which facilitates reaching any of its furthest points within a 12-hour period by vehicle from Kampala.

3.4   NMS should enhance its capacity to generate annual estimates of national drug needs to guide them in procuring sufficient quantities to hold in stock and for use by other stakeholders in accordance with the NMS Act.

Observations:

Demand forecasting is again another big issue here. This can be done. There are simple forecasting techniques (moving average) that are suitable for items without much seasonal variability. Trends and seasonal variations of certain drugs due to prevalence of certain diseases during such periods must also be taken into account, and appropriate forecasting techniques can be used for those items also. Drugs needed given a change in treatment policy should be conservatively forecasted.

Organizational structure (reporting line) changes might also help here (merging of procurement and stores under a Logistic Management section, as elaborated in our conclusions below).

3.5   NMS should revise and enforce the buffer stock policy to match the response time from suppliers so as to avoid stocks running out. This would minimize the capital locked in idle stock.

Observations:

Buffer/safety stock is definitely a big issue. This needs to be set based on item classification and the level of customer service intended. Order to receipt time also affects this, in addition to supplier reliability. Forecasting, as stated in 3.4, above, is crucial to achieving this.

Supplier response time also depends on the sourcing process. The Procurement and Disposal of Public Assets (PPDA) Regulations 2003, regulations: 111 and 112 addresses the sourcing of medicines with copyright and patents.

3.6   NMS and MOH collectively should advocate for NMS to be mandated and allocated funds directly to deliver all drugs to the various health centres according to EMLU, 2007 based on the disease information available with MOH. Health units could then only order drugs not automatically delivered by NMS due to exceptional disease circumstances unique to the health centre.

Observations:

For this to be realized, a proper demands analysis at the user level needs to be done, and appropriate systems put in place to capture genuine demands and demands for our of stock items (that could be lost sales or sale of a substitute item). The storage capacity of each NMS customer, in relation to the number and amount of drugs needed to be stocked at a given moment, also needs to be taken into consideration.

3.7   NMS management should champion the effort to cause the parties to amend their MOUs to incorporate joint procurement planning and shared stock position reports to encourage stocking drugs in adequate quantities to avoid duplicate deliveries, expiries, stock deficiencies and enhance the coordination of the procurement of drugs.

Observations:

This coordination is absolutely necessary, joint replenishment planning and shared stock positioning would enhance visibility of stocks on hand and thus positively influence the replenishment model; this would result in lower (and

more realistic) stock levels based on demand analysis and forecasting and not on artificially set levels (see also 2.6, above).

3.8   *NMS should use their representation in the Technical Review meeting to advocate for MOH to develop planning guidelines on drug usage to minimize expiries, and on the proper storage and ultimate disposal of the already expired medical products in health centres countrywide.*

Observations:

Demand forecasting is again very crucial. Requirements for storage and disposal can be obtained from the manufacturer. There is a need to develop a medical supplies quality assurance system for monitoring medical supplies in storage locations, determining stock rotation inspection, identifying candidates for expiration, identifying customers to which drugs were delivered in the event of manufacturer's drug recall.

The medical supplies quality assurance system would be populated with some of the following crucial data: quantity received; manufacturers' name; description of drug; lot number; expiration date; inspection and test; stock location; quantity on hand by manufacturer; lot number; quantity and customers issued to over a determined period; items and quantities identified for disposal/destruction; method of disposal/destruction (incineration, sanitary landfill, etc.).

3.9   *NMS could take up the responsibility of retrieval and subsequent destruction of expired drugs delivered by them to health centres as a matter of corporate social responsibility in line with their core values. They could utilize their available transport system (return trip on delivery) and their proximity advantage to Nakasongola Incineration point.*

Observations:

A good idea if resources are available. Disposal should be carried out by one entity. Less risk, more control. Expired stocks are also sold on black market at a high risk to the health of the population. A medical supplies quality assurance system, mentioned in 3.8, above, could be developed and used by the NMS. This would be considered reverse logistics, and its implementation would introduce a large element of control that would help reduce cost.

3.10   *NMS should use their representation on the NDA board to advocate for NDA to stipulate alternative means of drug destruction which is affordable for Health Units. It would remedy the logistical difficulty in accessing the only facility in the country located in Nakasongola.*

Observations:

Having only one drugs destruction facility could be contributing to the stock-piling of expired drugs; however, "alternative means of drug destruction" is also something that should to be carefully considered given that a drug item recommended for landfill destruction sometimes should not be incinerated (and vice versa). Sometimes there is only one method of destruction (for drugs containing hazardous materials, for instance). Some drugs and pharmaceuticals are radioactive, have live viruses and bacteria (vaccines, for example) and should only be destroyed in a specific manner. Incineration is not the only method of drugs disposal.

3.11   *NMS should consider introducing effective and efficient drug information inquiry desks to enable health centres to obtain information on drugs' availability.*

Observations:

Mobile telephony presents a viable platform (such as that developed by Ushahidi (http://www.ushahidi.com/)) for health centers and other customers to access real-time information/data on drug availability via the local SMS gateway, given the existing 12 million mobile phone users in the country. The Google, Grameen Foundation and MTN Uganda collaboration aimed at helping poor farmers and other underserved communities access information using mobile phones, is one such example.

4.   CONCLUSIONS AND OTHER OBSERVATIONS

4.1   The principal topic of the findings and recommendations of the audit report has been procurement, storage, expiration, distribution and disposal of medicines and other medical supplies; specifically: buffer stocks, excess stocks, shortages, expired stocks, disposal/destruction, distribution, availability, third party purchases, etc. Most of the issues faced by the NMS are related to logistics management and the proper administration and coordination of the various activities within a logistics chain, such as: requirements planning and forecasting, purchasing, inventory control and management, warehousing, distribution and disposal/destruction.

4.2 A rethinking of the organizational structure could probably be a first step in finding a solution to the NMS's management of medical supplies. Rather than fragment the logistics function, as is presently the case, consideration should be given to merging the procurement and stores and operations under a Logistics Management section. This will hollow for an appropriate focus on all the activities of the logistics chain and most importantly for identifying and resolving bottlenecks and tradeoffs especially as it relates to having a vision of and the ability to manage total logistics cost rather than of stand-alone activities within the logistics chain.

For example, some logistics activities could be conflicting if managed by separate departments: inventory management prefers to replenish stocks without creating excess, whereas procurement prefers to purchase in large amounts to obtain a reduce prices (economies of scale), storage, on the other hand, wants to optimize the use of storage space (reduce storage cost) by keeping the least possible number of items in stock. By coordinating all these activities under one Head of Logistics Management, the focus would be on trade offs and the total cost of logistics rather than that of any specific activity within that chain. This also gives greater visibility and lends itself to better coordination and management of the activities within the NMS's logistics chain.

4.3 The compilation of delivery procedures was not assessed in the report. The expiry of drugs or reducing the effectiveness of the shipped drugs also depends upon the mode and type of transportation with stipulated stringent shipment procedures. An assessment of the supply and logistics chain needs to be included in the next value for money audit as one of the terms of reference.

4.4 Though demand forecasting is a complex process, there are simple techniques, such as moving average for drugs with more stable demands. An attempt in this direction will save substantial amount of public money by reducing duplication of similar/alternative drugs, dumping of excess stock, etc.

4.5 The sharing of data (demand/stock level/ shipment requirements/ place of requirement etc.) among MOH, NMS and primarily with Third Parties is crucial to consider; especially given the fact that, as indicated in Figure 4 (*Analysis by source of 3rd party expired stock destroyed in November 2008 by NMS)* a significant amount expired drugs were from third party supplies and not with NMS/MOH purchases. This is a clear indication of the need for more coordination and data sharing between the MOH, NMS and third parties.

4.6 Poor management of expired drugs is directly related to Quality Assurance. A comprehensive quality assurance system needs to be put in place, such that all drugs, and other medical supplies, are monitored from receiving and inspection, until they are either issued to a customer or destroyed once expired or recalled by the manufacturer.

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