

**REFORMING SUPPORTIVE SUPERVISION OF MEDICINES MANAGEMENT WITH AN AUDIT TOOL IN PRIMARY HEALTH CARE FACILITIES: A CASE STUDY OF BAHI DISTRICT, TANZANIA**

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**ABSTRACT**

Stock-out of essential medicines is a common problem in primary health facilities of Tanzania. Alternative approaches such as the use of auditing tools have been proposed in order to strengthen the generally weak supportive supervision in medicines management. A cross-sectional study was conducted in ten primary health facilities in Bahi District in Dodoma region-Tanzania between October and December, 2013. Standardized auditing tools and indicators were used to assess the availability of ten essential tracer medicines, timeliness and correctness of ordering, record keeping, documentation and financial management. Analysis was done by using MS Excel spreadsheet (Microsoft Excel<sup>®</sup>, Microsoft Corporation). Mean availability of tracer medicines was 84%. Rapid Diagnostic Tests for malaria, artemether-lumefantrine, amoxicillin syrup and amoxicillin capsules were mostly found to be out of stock. Nine of the ten facilities submitted their ordering forms on time but only six of the ten facilities filled their ordering forms correctly. In five facilities, financial records did not balance with bank statements and receipt books. Medicines audits represent a feasible approach to strengthen medicines management at primary health facilities. The study validated standardized and simple tools that can be used to reform routine supportive supervision methodology.

**Key Words:** Tanzania, health facilities, financial audit, supervision, medicines, availability

**INTRODUCTION**

The World Health Organization (WHO) describes essential medicines as “those that satisfy the priority health care needs of the population” and they should be made available in “functioning health systems at all times in adequate amounts, in the appropriate dosage forms, with assured quality and adequate information, and at a price the individual and the community can afford.”<sup>[1]</sup> As the year 2015

approaches, with the deadline to achieving the Millennium Development Goals, particularly access to essential medicines in developing countries remains poor.<sup>[2]</sup> It is estimated that only about half of the required essential medicines are available in the public sector in developing countries.<sup>[2, 3]</sup> Contributing factors include insufficient and unsustainable financing mechanisms, unreliable supply chain systems and weak management capacity of human resources.<sup>[3, 4]</sup> The availability of tracer

medicine is considered to be an important parameter in the assessment of the performance or desired outcome of the health sector in resource-constrained settings.

The Abuja Declaration (2001) by the African Union countries set the lower limit target of allocating 15% of their annual budget to improving the health sector, but this is yet to be achieved by most countries.<sup>[5]</sup> The Government of Tanzania for example set aside only 8.2% of its annual budget to finance health for the financial year 2013/2014.<sup>[6]</sup> In order to complement its tax-based financing system, the Government of Tanzania has adopted alternative financing strategies including health insurance systems (National Health Insurance Fund - NHIF and Community Health Fund - CHF), user fees and pooling of donor funds. In Tanzania, under-5 children, pregnant women, the elderly and people with specific diseases such as HIV/AIDS, Tuberculosis and leprosy are entitled to free health services in public facilities.

Availability of medicines is a major indicator of perceived quality of health care services for most people in Tanzania.<sup>[7, 8]</sup> It is therefore considered an important prerequisite for motivating people to utilize health facilities and enroll in voluntary financing schemes such as CHF.<sup>[8, 9]</sup> Despite tremendous efforts by the government to improve the health of its citizens through provision of medicines and equipment, erratic supply or frequent stock-outs of medicines and supplies are common in the health care facilities. A situational analysis in Dodoma region in 2010 and a comprehensive baseline survey which was conducted by the Health Promotion and System Project (HPSS) in 2012 showed that the availability of essential medicines was 53% with a corresponding stock-out rate of 47% for 26 tracer medicines.<sup>[10]</sup> The HPSS project applied a comprehensive approach to health system strengthening: it looked both at the supply side (availability of medicines, financing) and the demand side (health promotion priorities from a community perspective).

Routine supportive supervision by Council Health Management Teams (CHMT) in the public sector in Tanzania is considered a way to improve and strengthen medicines management at facility level. This team is responsible for supporting workers and attempts to rectify weaknesses through coaching, change of process, increased knowledge, resources or time to help a person improve at the District Hospital and primary health facilities. However, due to limited capacity and resources, these supervisory

visits are often inadequate in terms of methodology, tools and follow-up.<sup>[10]</sup> Audit and feedback interventions are an innovative approach widely used to improve professional practice;<sup>[11, 12]</sup> hence can be employed in supportive supervision to increase the availability of essential medicines in primary health care facilities. This study aimed to determine the feasibility and usefulness of an internal audit using simple standardized monitoring tools in view of strengthening and reforming supportive supervision approach in primary health care facilities in Bahi district, Dodoma region - Tanzania.

## METHODS

**Study setting:** Bahi district is located in Dodoma region and has a total of 514 hamlets, 56 villages and 21 wards which are divided into four divisions. It has a population of 225,156 people according to the census report of 2012.<sup>[13]</sup> Bahi does not have a District Hospital; however it has six health centers and 33 dispensaries owned by the Government and Faith-Based Institutions. The level of human resources for health in the district is 70% of all requirements.<sup>[14]</sup> The study was conducted in the public sector only.

**Study design and sample size:** This is a cross-sectional study which was conducted in ten public health facilities, eight of them being dispensaries and two health centers between October and December, 2013. First, the facilities were stratified into urban and rural and a sampling frame was made for each stratum. Each facility was given a unique code number and a simple random sampling method using lottery approach was used to select four dispensaries and one health center for each stratum.

**Data collection:** Data was collected by a team composed of a pharmacist, a clinician, a nurse and an accountant. The study participants in the selected facilities were the in-charges and the health facility medicine store keepers. Data was collected by using a standardized checklist with indicators which was developed as a monitoring tool by the Health Promotion and System Strengthening (HPSS) project in collaboration with the Ministry of Health and Social Welfare (MoHSW) of Tanzania. This tool has three main variables: *medicines availability, timeliness and correctness of ordering and record keeping.*

A list of ten tracer medicines (See Table 1) categorized as essential for the primary health facilities were identified from the National Essential

Medicines List of Tanzania.<sup>[15]</sup> These medicines address priority disease conditions ranked high in the burden of diseases of Bahi District.<sup>[14]</sup>

Only stock-outs observed on the day of the assessment were taken into account. Data about timeliness and correct filling of ordering forms were retrieved from documents which were submitted to the District Medical Officer (DMO) three months prior to this study. The financial audit was done assessing relevant financial documents using a separate checklist which comprised queries related to *financial statements and regulations, receipts and exemptions orders*. Specifically, the following documents were reviewed: receipt books, pro-poor exemption permits and three months' financial flows using statement of accounts.

**Data management and analysis:** Data were recorded manually on site and entered into Excel spreadsheets afterwards. Analysis was done by using MS Excel spreadsheet (Microsoft Excel®, Microsoft Corporation).

#### Data Analysis

**Medicines availability:** Availability of the ten tracer medicines was recorded by dummy variables (Yes/No), therefore average availability was calculated by dividing the total number of "Yes" answers by ten (the total number of trace medicines), and expressed as a percentage.

Stock-outs of medicines were recorded into a four-step ordinal scale which was further narrowed into a two-step ordinal scale as follows: 1= Not available less than a week, 2= Not available for 1-3 weeks, 3 = Not available for 1 month and 4 = Not available for 2-3 months. 1 and 2 were categorized as a "short duration of stock-out", and 3 and 4 as "long duration of stock-out".

**Timeliness and correctness of ordering:** Routine Report and Request (R&R) forms were used to assess timeliness of ordering. Timely ordering was assessed based on whether the forms were filled and received by the DMO on time as required, which follows quarterly request of medicines from the Central Medical Stores Department (MSD).<sup>[16]</sup> On time ordering was defined by submission by the 5<sup>th</sup> of every three months and defined as late when submitted after the 5<sup>th</sup> of every three months. Assessment of correctness in ordering of supplies was done by using the consumption formula which is expressed as the sum of the beginning balance and quantity received adjusted for loss, less the ending

balance.<sup>[16]</sup> The relevant documents were used which included the receipt and issuing vouchers from MSD.

**Record keeping:** Record keeping was assessed by counting medicines recorded in the ledger book and the physical inventory from the store and dispensing area and later matching it to the dispensing registers. The result was calculated with record keeping in % = Total number in ledger book divided by total number in physical inventory x 100. Interpretation was defined by setting up criteria to distinguish between "proper" and "improper" record keeping.

1) % > 100 → more medicines in ledgers than in stock → missing in storage room and not accounted for → improper record keeping.

2) % < 100 → more medicines in stock than in ledgers → not entered in ledger book after receiving → improper record keeping.

3) % = 100 → proper record keeping.

**Financial Audit:** Receipt books were compared with bank statements to assess matching of funds collected and deposited in the bank account. Pro-poor and elderly exemptions were assessed and criteria evaluated for correctness.

**Additional data:** Health care providers were asked whether they attended any formal training on Integrated Logistics System (ILS) of medicines, supplies and medical equipment since they were employed. General store conditions were reviewed, including observations regarding storage practice, expired medicines, cleanliness of the store room, and storage according to FEFO (First Expired - First Out).

## RESULTS

**Availability of medicines:** Table 2 shows the characteristics of the health facilities and the availability of tracer medicines.

Availability of medicines in urban facilities which were on average 26 km from the DMO's office was 82%, compared to 86% for rural facilities which were about 68 km from the DMO's office. Items which were most commonly out of stock were: Malaria Rapid Diagnostic Tests (m-RDT), Artemether Lumefantrine (ALu) and Amoxicillin syrup and tablets. Of the seven facilities which reported stock-outs of some tracer medicines, the majority (70%) reported short time (less than three weeks) stock-outs, while a few (30%) reported long (a month or more) duration out of stocks.

**Timeliness and correctness of orders:** Nine of the ten health facilities submitted their ordering forms to

the District Medical Officer on time but only six of the ten health facilities filled their forms correctly. The main error detected was incorrect forecasting and estimation of consumption of medicines.

**Record keeping and the ILS training status:** The record keeping score for three health facilities was more than 100%. Three health facilities had a score of less than 100% while the score of four health facilities was equal to 100%. This indicates a problem with record keeping which can contribute to the reported stock-outs.

All (100%) health care providers who participated in this audit reported that they had attended a five days training on ILS.

**Financial auditing:** Financial income matched with bank statements and receipts in only five facilities. In two facilities, income from the sale of medicines exceeded the money deposited in bank accounts, with a loss incurred of an average of 151 US\$ per month per facility. In the remaining three facilities, some receipt books for collection of user fees and CHF were missing, making it difficult to reconcile collections with bank statements. Nevertheless, a discrepancy of an average of 64US\$ per month for each of the three health facilities was detected. As verification was not possible, the amount could have been higher. On comparing the exemption permits for medicines, the criteria used were neither clear nor standardized for all ten facilities. In addition, significant variations were observed among the exempted groups in terms of processes used in provision of exemptions.

**Storage of medicines:** All audited health facilities were found to follow good storage practice and arrangement of medicines according to national and international guidelines.

## DISCUSSION

Supportive supervision for health facilities in Tanzania has been described to be weak,<sup>[17, 18]</sup> and often lacks the capacity to identify important system weaknesses related to medicines management. However, by using our standardized medicine and financial auditing tool, we were able to determine medicines availability, stock-outs, ordering through proper filling of forms, timeliness in placing the orders and accounting for pharmaceuticals in the study facilities. Medicine availability is a critical determinant of quality of care and influences the utilization of health care facilities and contribution to voluntary financing schemes<sup>[8]</sup>. Medicine availability

in the public sector promotes equity in access to health care since the poor cannot afford high prices of medicines sold in the private pharmacies.

This study found that the availability of medicines was 84%, compared to 67% reported by a previous study.<sup>[10]</sup> The difference may be explained by the timing of the survey, the type and the number of medicines used, the sample size and the level of facilities. Interestingly, the availability of medicines was almost similar in the urban and rural facilities despite the fact that the latter were relatively far from the District Head Office. Usually, one would assume that the nearest facilities are well served because of short travel time and the preference of health care workers to work in urban settings.<sup>[18, 19]</sup> On the other hand, health centers seem to be better equipped than dispensaries, whether in urban or rural setting and irrespective of service population.

Four of the health facilities had incorrectly filled ordering forms with respect to quantification and forecasting despite the health care workers receiving training about the Integrated Logistics System (ILS) for medicines.

This is not surprising, since training alone has been documented not to be sufficient to change practice,<sup>[20]</sup> and even when effective, the results are transient and unsustainable.<sup>[4]</sup> This emphasizes the importance of mentoring and coaching of health care providers even after they receive trainings.

Half of the health facilities audited had poor financial records not matching with bank statements and receipt books. Whether this was a result of poor financial management or – worse – of purposely mismanaged accounting for misappropriation could not be established by our study. This underscores the importance of routine financial auditing to closely monitor and detect improper records and book keeping. Similarly, some medicines in the health facility stores were missing and not accounted for. This could either be due to poor documentation or theft.

**Limitations of the Study:** Despite the importance of the information generated from this study, there were some limitations. The study involved a small sample of only ten health facilities. Therefore findings cannot be generalized to other settings. In addition, the study only provides a snapshot of the situation on the day of audit, looking only at tracer medicines.

**CONCLUSIONS**

This study provides evidence that medicines and financial audits are practical and feasible, and represent an important approach to supervise and hence strengthen medicines management at health facilities. This methodology has the potential to reform current supportive supervision for medicines management in Tanzania. The medicine and financial auditing tools proved to be a simple and feasible methodology and if used appropriately and consistently in routine supervision activities by the CHMT, could improve the availability of essential medicines and pharmaceutical accounting at Primary Health Care facilities in Dodoma region and Tanzania at large.

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**Ethical approval:** Not required.

**Table 1: Tracer Medicines**

1	Diphtheria/Pertussis/Tetanus + Hep B + HiB vaccine for immunization (Pentavalent)
2	Artemether / Lumefantrine (ALu) oral
3	Amoxicillin oral
*4	Albendazole or Mebendazole oral
5	Oral Rehydration Salts
*6	Ergometrine injectable, Oxytocin injectable, or Misoprostol oral
7	Medroxyprogesterone acetate (Depo-Provera) injectable contraceptive
*8	Dextrose 5% solution or Sodium chloride / Dextrose solution for intravenous injection
9	Syringe and needle, disposables
*10	Field stains A&B and slides for malaria microscopy, or Rapid Diagnostic Test (m-RDT) for malaria

*For item No. \*4, \*6, \*8, \*10 availability of any of the commodities was considered "available".*

**Table 2: Characteristics and availability of medicines in the facilities**

Name & type of health facilities	Service Population	Availability of medicines (%)	Medicines out of stock	Setting	Distance (km) from the main store in the District	Discrepancy in fund reconciliation (USD)
Bahi Health Center	17,313	100	-	Urban	5	0
Bahi Makulu Dispensary	2,751	75	mRDT, ALu, Depo-Provera	Urban	15	-65 *
Ibihwa Dispensary	11,177	80	mRDT	Urban	20	0
Chikola Dispensary	15,206	80	mRDT, amoxicillin	Urban	30	-74*
Ilindi Dispensary	8,946	80	Depo-Provera, amoxicillin	Rural	50	0
Mpalanga Dispensary	4,778	75	mRDT, amoxicillin	Urban	60	0
Isagha Dispensary	5,212	100	-	Rural	65	0
Chibelela Dispensary	10,680	75	ALu, mRDT, amoxicillin	Rural	70	-173
Ibugule Dispensary	8,425	75	mRDT, ALu	Rural	75	-52*
Mwitikira Health Center	6,842	100	-	Rural	80	-129

\*Some missing receipt books

ALu-Artemether / Lumefantrine, mRDT- Malaria Rapid Diagnostic Test, Depo-Provera- Medroxyprogesterone acetate

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