Vol. 15 (2012) 77-82

# Rational Use of Medicines in Relation to Pharmaceutical Supply System in District Hospitals of Dar es Salaam Region

R.S. MALELE[1]* AND P. BWIRE[2]

[1]*School of Pharmacy, Muhimbili University of Health and Allied Sciences, P.O. Box 65085, Dar es Salaam, Tanzania.*
[2]*John Snow Inc., P.O. Box 9263, Dar es Salaam, Tanzania.*

**Pharmaceutical management involves a set of practices aiming at ensuring timely availability and appropriate use of safe, effective and quality pharmaceuticals and services in any health care setting. Rational use of medicines is often associated with efficiency of pharmaceutical supply system that operates in the health care system. Pharmaceutical supply system involves planning and programming for pharmaceutical requirements, procurement, storage and distribution which are the necessary steps towards rational use of medicines.**

**Key words:** Pharmaceutical management, pharmaceutical supply system, rational use of medicines

## INTRODUCTION

Low income countries have a limited budget allocated to health care particularly for procurement of pharmaceuticals. It is necessary to optimize expenditures for purchase of pharmaceuticals by selecting essential medicines and promoting rational use of medicines. Tanzania developed its essential medicines list (NEMLIT) since 1983 and the updated third edition of 2007 has provided a rational basis not only for pharmaceutical supply at various levels within the health care system, but also promotes rational use of pharmaceuticals.

Hogerzeil *et al*. reported inefficient and irrational use of medicines as a widespread problem at all levels of health care system. Per capita wastage from inefficiencies and irrational use tend to be greatest in hospitals; this is particularly upsetting since resources are scarce [1]. However, the study done in Nepal reported that improved pharmaceutical supply and cost-sharing resulted in more appropriate prescribing in terms of dosage, but it also led to more polypharmacy and excessive medicine use [2]. Similarly, studies done in Bangladesh and Nigeria found that drugs were apparently prescribed according to which medicines were available at health centres and not necessarily according to the patient needs [3,4].

Pharmaceutical management has been identified as a key area that deserves improvement. Often the first problem identified is that district health facilities particularly hospitals do not have adequate medicines in stock. Furthermore, it has been shown that unavailability of essential medicines is a major hindrance in the treatment of diseases that predominantly affect the developing countries [5]. The availability of pharmaceuticals has been one of the most visible symbols of quality of care of any health care system. In Nigeria, patient visits dropped by 50% to 75% when health facilities ran out of commonly used medicines [6]. Ensuring regular supply of pharmaceuticals to hospitals has been one of the important steps towards improvement of quality of health care.

However, it is also necessary to address medicine use patterns by ensuring that the supplied medicines are used rationally. Therefore, it is the aim of this study to assess rational use of medicines in relation to the pharmaceutical supply system at the district hospital levels of health care system in Tanzania.

## MATERIALS AND METHODS

Cross sectional descriptive indicator study using the World Health Organization (WHO)

*Author to whom correspondence may be addressed.

Medicines Use Indicators and the World Medicines Situation check list were used to collect information [7,8]. Study sites that were conveniently sampled included Amana Hospital, Mwananyamala Hospital and Temeke Hospital. Retrospective data was collected from orders for procurement for the year 2009/2010 excluding those of vertical programs procurement and through interviews with out-patients. The list of tracer medicines was prepared based on top 10 prevalent diseases for 2009/2010 excluding chronic conditions. A descriptive study was conducted to assess rational use of medicines in relation to pharmaceutical supply system. A total of three hundred (300) out-patients were prospectively interviewed for assessment and verification of data on hospitals "fulfillment on patients" prescribed medicines requirements using WHO medicine use indicators and operational checklists. Data management and analysis was done on SPSS version 16.0 statistical package.

## RESULTS AND DISCUSSION

As shown in Table 1, the supply system had the order delivery time of 1 day and service level of 54.9%. The hospitals made on average 76 procurement orders in year 2009/2010 with an average of more than twelve medicines procured on emergency basis. Figure 1 indicates that only 40% of the stock records were found to have no discrepancies, while Figure 2 shows that up to 8.9% of the medicines were found to have expired on the day of visit. Table 2 reveals that the mean average number of medicines per prescription was 2.8 ± 1.2. As captured in Figure 3, only 60.4% of the prescribed medicines dispensed, 55.7% prescribed in generics and 89.4% prescribed from the NEMLIT. Figure 4 shows 49.7 ± 29.9% was the average percentage of reference materials available in the hospitals. The average percentage time out-of-stock was 29.9%. This means that on average one of the tracer medicines was out of stock for at least 29 days (Figures 5-7).

**Table 1: Performance of procurement system on supply of medicines to the hospitals in 2009/2010**

| Performance indicator | Results |
|---|---|
| Order fulfillment performance (service level) | 54.9% |
| Order delivery time (lead time) | 1 day |
| Number of procurements per year | 76 |

**Table 2: Prescribing indicators for rational use of medicines**

| | |
|---|---|
| Number of medicine per prescription encounter | 2.8 ±1.2 |
| Median | 3 |
| Total number of medicines | 848 |
| Minimum number of medicines | 1 |
| Maximum number of medicines | 8 |

N = 300 patients

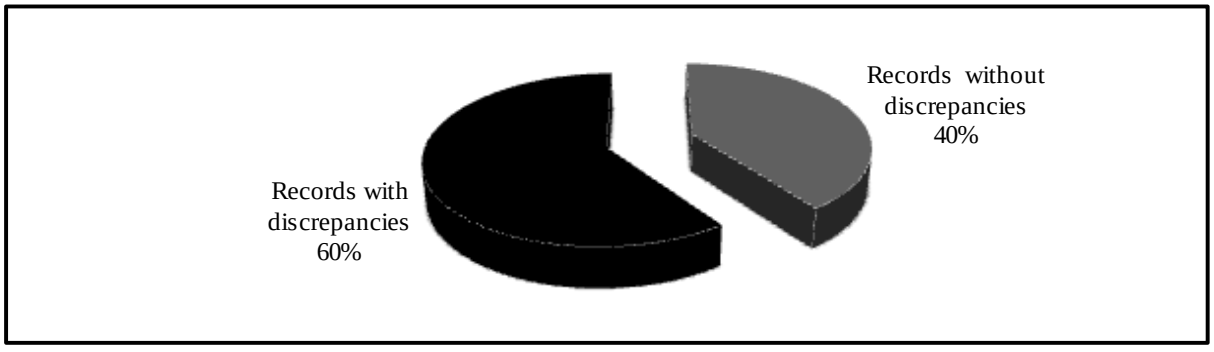


**Figure 1. Effectiveness of inventory management.**

**Table 3**: **Performance of procurement system on supply of medicines to the hospitals**

| | Ordered | Received | Partially delivered |
|---|---|---|---|
| Mean number of medicines | 15.3 ± 1.9 | 8.4 ± 1.1 | 0.5 ± 1.4 |
| Total number of medicines | 3510 | 1928 | 120 |
| Minimum number of medicines | 1.0 | 0.0 | 0.0 |
| Maximum number of medicines | 118.0 | 77.0 | 13.0 |
| Median | 8 | 4 | 0 |

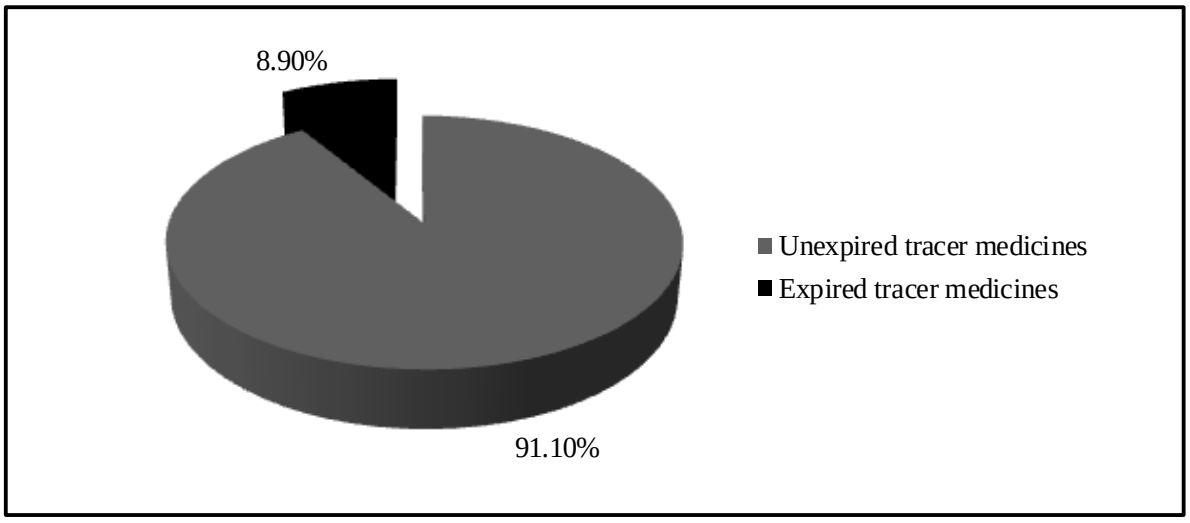


**Figure 2. Efficiency of inventory management.**

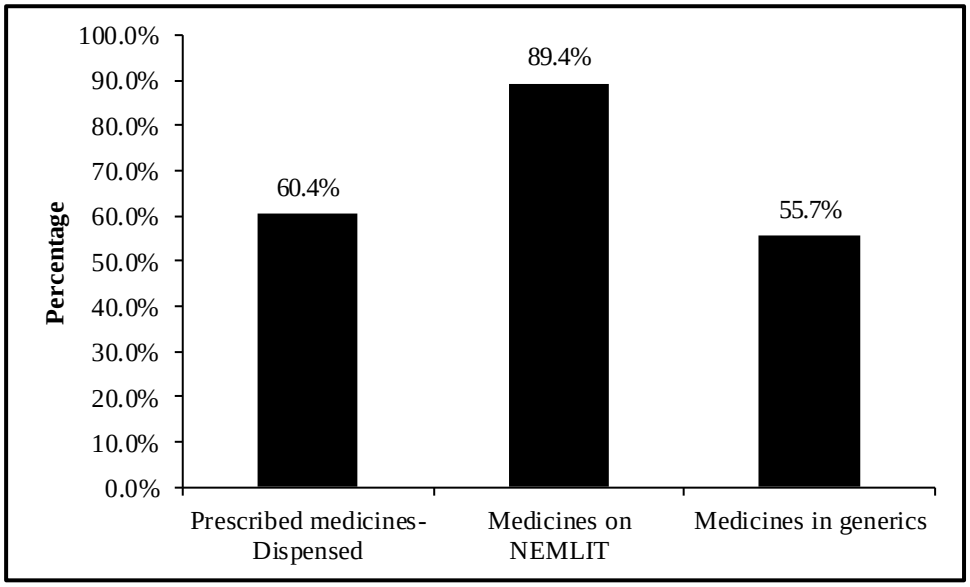


**Figure 3. Indicators for rational use of medicines.**

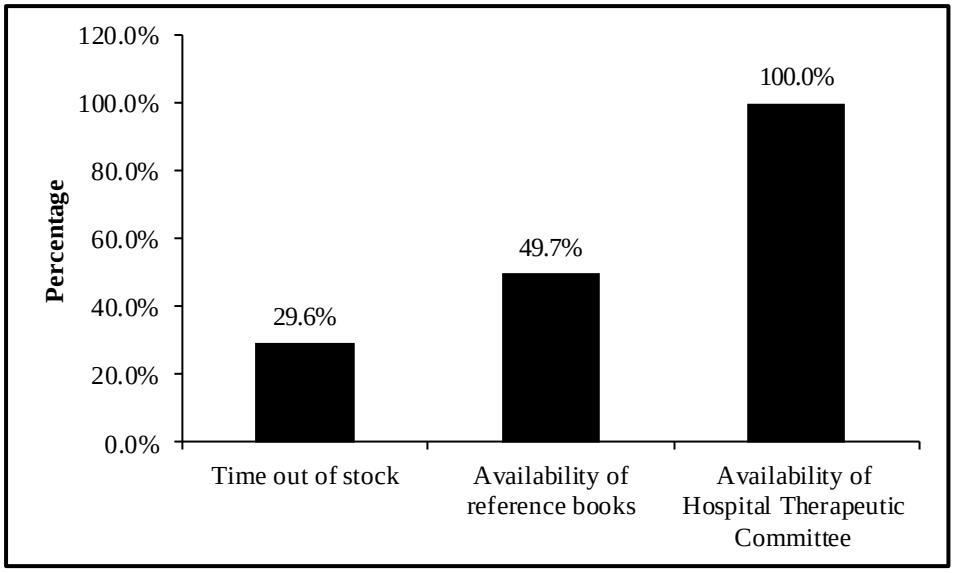


**Figure 4. Facility indicators.**

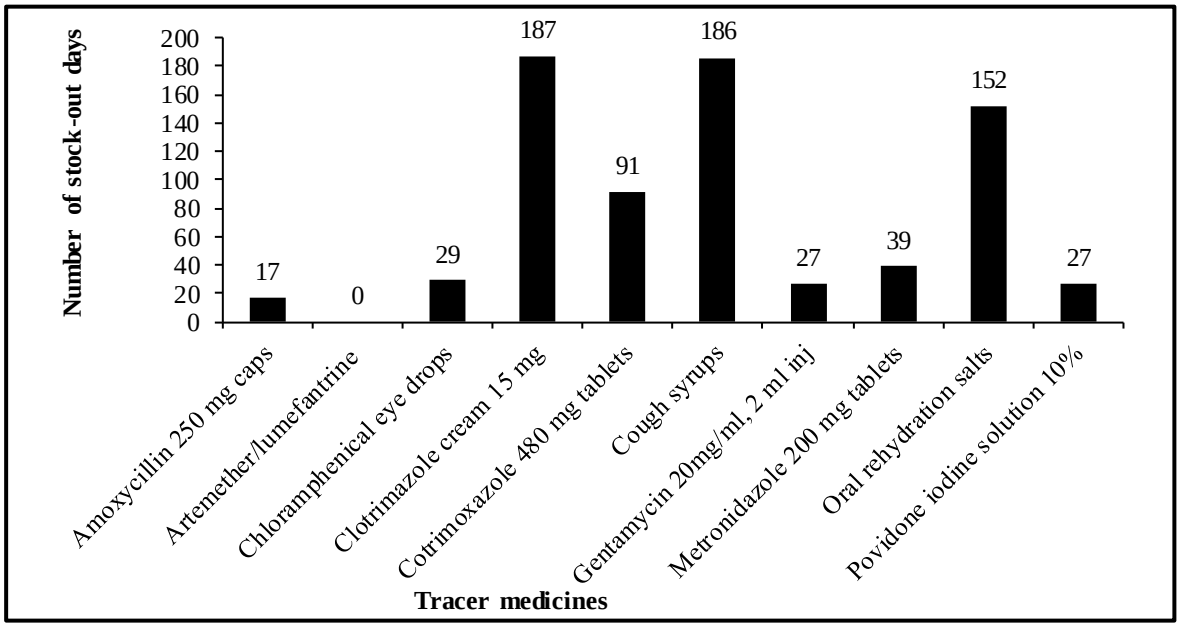


**Figure 5. Availability of medicines at Amana Hospital.**

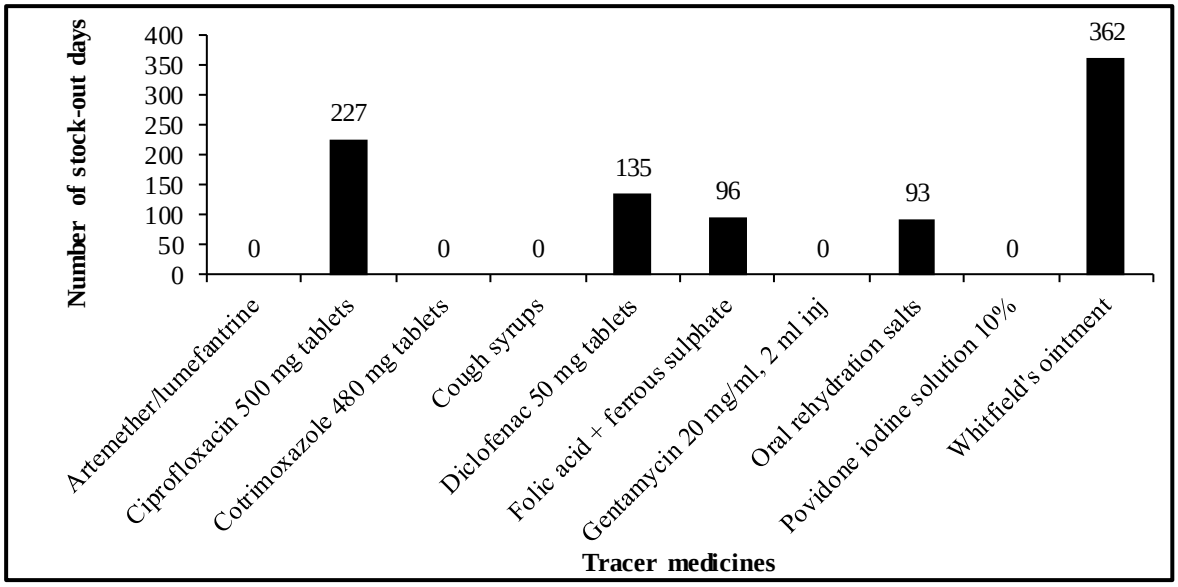


**Figure 6. Availabilty of medicines at Mwananyamala Hospital.**

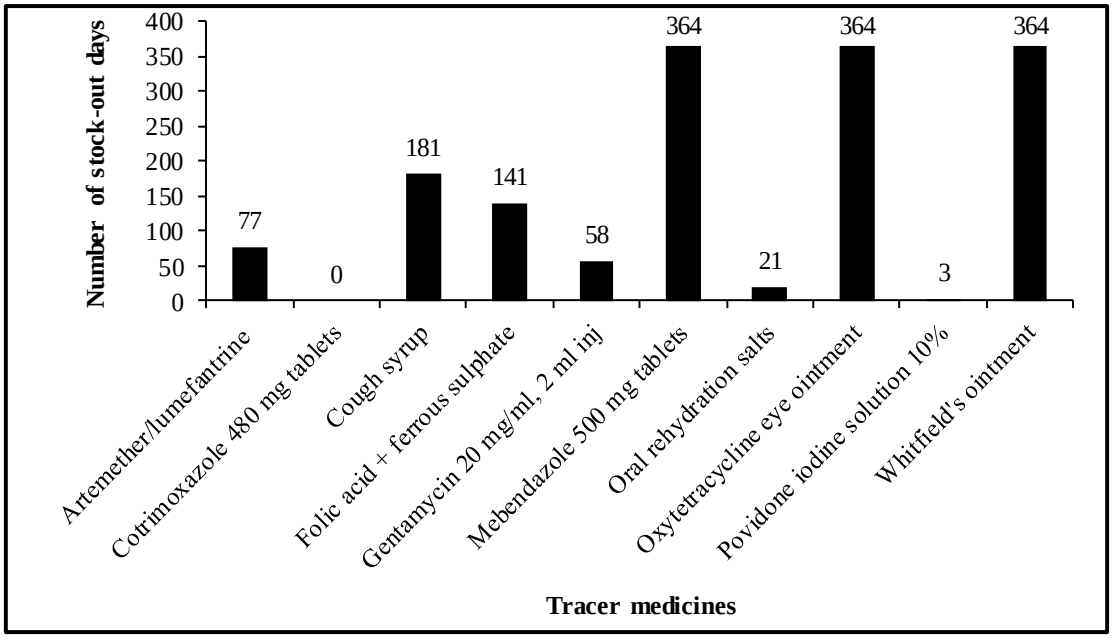


**Figure 7. Availability of medicines at Temeke Hospital.**

## CONCLUSION

There is a need for more emphasis on the improvement of pharmaceutical supply system performance as it has influence on rational use of medicines by influencing availability of medicines. This necessitates personnel involved in pharmaceuticals supply system to be trained regularly in pharmaceutical management and rational use of medicines. The use of NEMLIT, generic prescribing and use of generics in the procurement of pharmaceuticals in the hospitals needs to be emphasized. The availability of other reference books should be ensured and staff to be encouraged to use them in procurement and use of pharmaceuticals**.**

**REFERENCES**

[1] H.V. Hogerzeil, A.O. Sallami, G.J.A. Walker and G. Fernando. Lancet 1, 1989, 141-142.

[2] J. Chalker. Does Regular Drug Supply and Fixed Prescription Fee Mean Better Drug Use? London School of Tropical Medicine and Hygiene, and Britain-Nepal Medical Trust. Unpublished Report, 1992.

[3] A.B. Guyon, A. Barman, J.U. Ahmed, A.U. Ahmed and M.S. Alam. World Health Organ. Bull. 72, 1994, 265-271.

[4] B.S.C. Uzochukwu, O.E. Onnujwekwe and C.O. Akpala. Health Policy Planning 17(4), 2002, 378-383.

[5] B. Pécoul, P. Chirac, P. Troullier and J. Pinel. J. Am. Med. Assoc. 231, 1999, 361-367.

[6] World Bank Report. The Importance of Pharmaceuticals and Essential Drugs Programmes: Better Health in Africa. Experience and Lesson Learned. World Bank, Washington DC. 1994.

[7] World Health Organization. How to investigate medicine use in Health facilities: selected medicine use indicators. WHO Press, Geneva. 1993.

[8] World Health Organization. The World Medicines Situation. WHO Press, Geneva. 2004.