

**STOCK MANAGEMENT OF EMERGENCY OBSTETRIC CARE
PRODUCTS IN PUBLIC HEALTH FACILITIES IN
DAR ES SALAAM REGION, TANZANIA.**

Bora Jasmine Makuta

**MSc. (Pharmaceutical Management) Dissertation
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By

Bora Jasmine Makuta

**A dissertation submitted in partial fulfilment of the requirement for the Degree
of Masters of Science in Pharmaceutical Management of
Muhimbili University of Health and Allied Sciences.**

**Muhimbili University of Health and Allied Sciences
October, 2013**

CERTIFICATION

The undersigned certify that she has read and hereby recommend for acceptance by Muhimbili University of Health and Allied Sciences a dissertation entitled: **Stock management of emergency obstetric care products in public health facilities in Dar es salaam, Tanzania** in (Partial) fulfilment of the requirements for the degree of Master of Science in Pharmaceutical Management of Muhimbili University of Health and Allied Sciences.

Dr. Godeliver Kagashe
(Supervisor)

Date

DECLARATION

AND

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DEDICATION

To my parents, Papa **LAURENT MAKUTA WA MUHASA** and Mama **DEKILA MASIKA MBULA MAKUTA**, for raising me up into becoming what and who I am today.

To my brothers: Dr. Charles Kashindi Makuta, Dr. Vicky Muhindo Makuta, Ingr. Sammy Baraka Makuta, and my sisters Tchika Masika Makuta and Gloria Kavira Makuta.

I love you all and am very grateful to God that I am your daughter and sister.

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I will give thanks to the LORD with my whole heart; I will tell of all thy wonderful deeds. I will be glad and exult in thee. I will sing praise to thy name, O Most High. Psalms 9:1-2.

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ABSTRACT

Background: In developing countries most women die from pregnancy related complications. In Tanzania maternal deaths is caused by hemorrhage, obstructed labour, unsafe abortion, infection (sepsis), and eclampsia (pregnancy induced hypertension). Indirect causes like malaria, HIV and anemia also contribute to maternal death. All these lives could be saved if affordable, good quality obstetric care were available 24 hours a day, in the presence of skilled birth attendant and available and accessible medicines and medical supplies for emergency obstetric care.

Aim of the study: To assess the availability and stock management of emergency obstetric care products in public health facilities.

Methods and materials: A Descriptive cross-sectional study was conducted in the public health facilities selected in a stratified random sampling technique to represent the public health facilities found in three municipalities of Dar es Salaam region. The study population included drug store managers, nurses in charge of the labour ward and pregnant women admitted and waiting to give birth (in hospitals), and those present at the facility on the day of visit. The Inventory Management Assessment Tool, a well validated tool of MSH was used to assess the availability of tracer products for the past three months at surveyed health facilities; Questionnaires were used to interview health workers and pregnant women.

Data was collected between April 10th and May 29th 2013, after obtaining consent from the study participants.

Results:

The availability of EmOC products was found to be low at the health facilities; i.e. parental uterotonics by 19%, parenteral antibiotics 23.8%, parenteral anticonvulsants 33.3%. Most anti anemic drugs were seen to be present by 66.7% at the health facilities. Medical supplies showed a significant low availability as well.

Most pregnant women were asked to bring in their items for delivery and majorities were able to bring the items that they were asked to bring before they gave birth.

The knowledge of the drug store managers on stock management was found to be low.

Oxytocin was found to be stored either directly on the floor, in metallic trays or in cool boxes which uses gas as a source of power.

The results revealed that the storage condition at the labour ward in hospitals was dissatisfactory as compared to the health centre and dispensary levels where it was very dissatisfactory.

Conclusion:

The availability of EmOC products was found to be low at the surveyed health facilities. The consumption of EmOC products in the labour wards was found to be lower than the real actual consumption. The storage conditions in the labour wards were very dissatisfactory. Pregnant women were asked to bring in their own products for delivery. The present result shows the stock management of emergency obstetric care products was poor and the products were kept in an inadequate storage area.

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ACRONYMS

AMDD	Averting Maternal Death and Disability
AMO	Assisted medical Officer
ANC	Ante Natal Care
BEmOC	Basic Emergency Obstetric Care
CEmOC	Comprehensive Emergency Obstetric Care
DHS	Demographic and Health Survey
EMF	Essential Medicine Formulary
EmOC	Emergency Obstetric Care
HF	Health Facility
ICB/ICT	International Competitive Bid/ International Competitive Tender
I.M	Intra muscular
IMAT	Inventory Management Assessment Tool
IU	International Unit
I.V	Intra venous
LSS	Life Saving Skills
MDG	Millennium Development Goal
MMR	Maternal Mortality Rate
MNH	Muhimbili National Hospital
MOHSW	Ministry of Health and Social Welfare
MSD	Medical Store Department
MSH	Management Sciences for Health
MUHAS	Muhimbili University of Health and Allied Sciences
NCB/NCT	National Competitive Bid/ National Competitive Tender
NDP	National Drug Policy

NEDLIT	National Essential Drug List for Tanzania
NEML	National Essential Medicine List
NGO	Non-Government Organization
PHC	Public Health Care
PNC	Post Natal Care
PORALG	Prime Minister's Office Regional Administration and Local Government
PPA	Public Procurement Act
PPH	Post-Partum Hemorrhage
PPRA	Public Procurement Regulations
RCH	Reproductive Child Health
SBA	Skilled Birth Attendant
SSA	Sub Saharan Africa
STG	Standard Treatment Guideline
TBA	Traditional Birth Attendant
TDHS	Tanzania Demographic Health Survey
TFDA	Tanzania Food and Drug Authority
UN	United Nations
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
WHO	World Health Organizations

CHAPTER ONE

1.0. INTRODUCTION

1.1. Maternal Mortality Rate and Reproductive Health in women.

Maternal mortality and morbidity remain a major challenge worldwide. A recent study by Hogan et al, reported in the Lancet 2010, estimated 342,900 maternal death worldwide in 2008. This data suggest some progress in some countries (1). But the number of maternal mortality remains unacceptably high and most are preventable (2).

Maternal mortality rate has declined in sub-saharan Africa in the last two decades, progress remains insufficient to achieve MDG 4 and 5 (3).

In Tanzania maternal mortality has declined but not at the rate required. Maternal mortality stood at 454 deaths per 100,000 live birth in 2010, while Tanzania's 2015 MDG target is a maternal mortality rate of 133/100,000 live birth. Efforts are therefore required at national levels in order to achieve the 2015 target of reducing under five and maternal deaths by two thirds and three quarters from the 1990 levels, (529 per 100,000 live births in 1996 to 578 in 2004/05) respectively (4).

Major causes of maternal death are hemorrhage, obstructed labour, unsafe abortion, infection (sepsis), and eclampsia (pregnancy induced hypertension). Indirect causes like malaria, HIV and anemia also contribute to maternal death. All these lives could be saved if affordable, good quality obstetric care were available 24 hours a day, in the presence of skilled birth attendant and available and accessible medicines and medical supplies for emergency obstetric care.

1.2. The importance of emergency obstetric care services

Emergency obstetric care is an evidence-based package of interventions and services that can save lives of mothers and new born (5).EmOC interventions include indicators which are principally used in monitoring the extent of availability and implementation of treatment of emergency obstetric complications responsible for maternal death. These

indicators include for basic services the following: the administration of parenteral antibiotics, uterotonic drugs, or anti-convulsions, management of abortion complications, management of post-partum bleeding, assisted delivery for prolonged labour; For comprehensive services the above mentioned indicators as well as abilities to perform surgery (caesarean section) and give blood transfusions are included (6).

Studies have shown that 15% of pregnant women can expect to develop complications during pregnancy or delivery and will require emergency obstetric care (2). That is why quality EmOC services needs to be available to every pregnant woman.

The second leading cause of maternal death is pre-eclampsia and eclampsia most often detected through the elevation of blood pressure during pregnancy which can lead to seizures, kidney and liver damage, and death, if untreated. These conditions claim the lives of an estimated 63,000 women each year, as well as the lives of many of their babies. The risk that a woman in a developing country will die of pre-eclampsia and eclampsia is approximately 300 times higher than that for a woman in a developed country (7). Given that the causes of maternal deaths are difficult to predict, or to prevent, global health experts such as WHO, UNICEF, and UNFPA have advocated for improved access to emergency obstetric care as the best means of reducing maternal mortality in low-and middle-income countries.

1.3 Emergency Obstetric Care Products Overview

1.3.1. Medicine Overview

Expanding access to essential maternal health medicines would lower maternal death rates and improve maternal health. A list of the EmOC medicines is given at the appendix of this study, but for the purpose of our study the following major EmOC medicines and the ones concerned with the storage conditions are going to be discussed further; these medicines includes : Oxytocin, Ergometrine, Misoprostol, and Magnesium sulfate.

1. Oxytocin

Oxytocin is secreted naturally by the posterior pituitary during later pregnancy, labor, and when the baby breastfeeds. Synthetic forms of oxytocin are found in brand-name products as well as in generic form. In moderate doses, oxytocin produces slow, generalized

contractions of the muscles in the uterus with full relaxation in between. When used for postpartum hemorrhage, oxytocin takes effect sooner than most other uterotonic drugs, including misoprostol. One of the major drawbacks of oxytocin, however, is that it is temperature sensitive, and loses effectiveness after three months of being stored at temperatures higher than 30 degrees Celsius (86 degrees Fahrenheit). While some manufacturers' studies indicate that oxytocin can be stored at room temperature, the ambient temperature in tropical countries is often higher for extended periods of time. Oxytocin is most often available in 1ml glass vials, containing either 5 (international units) IU or 10 IU, and is administered by injection into the woman's vein or muscle. Doses range between 10 IU for prevention of postpartum hemorrhage and up to 40 IU for treatment. The medicine costs roughly US\$0.18 approximately 300 TSH, for 10 IU (supplier median price) and is produced by more than 100 manufacturers globally (7).

2. Misoprostol

Misoprostol is a prostaglandin, a synthetic hormone-like substance found in brand-name products and other generic forms. In low-resource settings where oxytocin and a skilled birth attendant may not be available, misoprostol may be used to prevent and treat excessive bleeding after childbirth. Misoprostol may also be used to treat gastric ulcers, miscarriages, or to induce abortion. The latter use explains some of the controversy surrounding the medicine and some countries' reluctance to recommend its use. Misoprostol is available in an oral tablet form, and the WHO recommends 600 micrograms orally for the prevention of postpartum hemorrhage, and permits 800 micrograms sublingually as the third line treatment for postpartum hemorrhage. Tablets contain 25 (for induction), 100, or 200 micrograms, and can be stored at room temperature if appropriately packaged in double-aluminum blister packs. The cost per tablet from manufacturers is approximately US\$0.15 approximately 250 TSH. It is available from more than 50 manufacturers globally (with at least 35 in developing countries) (7).

3. Ergometrine

Ergometrine contracts the human uterus. This action depends partly on the contractile state of the organ. On a contracted uterus (the normal state following delivery), Ergometrine has relatively little effect. However, if the uterus is inappropriately relaxed, Ergometrine

initiates strong contractions, thus reducing bleeding from the placental bed (the raw surface from which the placenta has detached). Ergometrine also has a moderate degree of vasoconstrictor action per se.

The mechanism of action of Ergometrine on smooth muscles is not understood. It is possible that it acts partially on α -adrenoceptors, like the related alkaloid ergotamine and partly on 5-HT receptors. Ergometrine can be used to treat postpartum hemorrhage.

Ergometrine can produce vomiting, probably by an effect on dopamine D2-receptors in the chemoreceptor trigger zone. Vasoconstriction with an increase in blood pressure associated with nausea, blurred vision and headache can occur, as can vasospasm of the coronary arteries resulting in angina (8).

4. Magnesium sulfate

Magnesium sulfate referenced as $MgSO_4$ is recognized by the WHO as the safest, most effective, and lowest-cost medication for treating pre-eclampsia and eclampsia. Magnesium sulfate is the standard treatment for these conditions in the majority of developed countries, but less-effective and riskier medications, such as diazepam and phenytoin, still are widely used in developing countries. Magnesium sulfate costs approximately US\$0.10 per ml equivalent to 150 TSH, (supplier median price), and is produced by one global manufacturer and many local manufacturers worldwide. A treatment may require up to nine vials. Magnesium sulfate is administered by injection into the woman's vein or muscle. Calcium gluconate a mineral supplement is an antidote available in the rare event of magnesium toxicity (7).

1.3.2. Other EmOC Products Overview

Emergency obstetric care products extends to these other products in the list given at the appendix three of this study, these other products were also studied.

1.4. Structure of National Health and pharmaceutical system in Tanzania

The health system in Tanzania mainland has two major components; the public and the private sector.

The public share is 56%; the private share is 44% (which includes Faith Based Organizations (FBOs) 30% and private non –profit 4%). The system works at four levels; the community, the wards where there is a dispensary and a health centre at the division level. As one moves further there is the district and regional levels respectively. Whereas at the zonal and national levels, are the consultant/ referral hospitals (8).

Presently in Tanzania there are a total of 5,379 health facilities geographically distributed. Administratively, the health system is largely decentralized. The MOHSW has direct responsibility for the referral and regional hospitals, and regulatory power over all the health facilities. The district facilities are independently run by the Prime Minister’s Office Regional Administration and local Government (PORALG). Dar Es Salaam alone is estimated to have 92 public health facilities(9) of which 37 are in Kinondoni municipality, 26 and 29 in Temeke and Ilala respectively, including Muhimbili National Hospital and the Ocean Road Cancer Institute (9).

The health facility infrastructure in Tanzania is dominated by lower level facilities, mainly dispensaries. The majority of the population including pregnant women therefore first seeks health care in dispensaries. Services provided for pregnant women include ante-natal care (ANC) and delivery. Lower level facilities are however, less likely to provide quality maternal health services, in terms of appropriate infrastructure, skilled personnel and equipment. For example, dispensaries and many health centres lack the necessary equipment to handle complications during pregnancy and delivery (8). Hospitals, which generally are better equipped and staffed with more qualified personnel, are few, and linkages between hospitals and lower level facilities in terms of referral are weak. Active collaboration between referral levels is necessary for effective maternal health care. All this has translated into continued unacceptably high MMR in Tanzania, as many women die of direct obstetric complications. Thus the need for access to hospital level maternal health care by all pregnant women appears clear (10).

1.4.1. The National health policy

The Tanzania National Health Policy is aimed at improving the health status of all people wherever they are, in urban and rural areas, by reducing morbidity and mortality and

raising life expectancy. Good health, i.e. physical, mental and social wellbeing, is a major resource and economic development (11). The overall objective of the health policy in Tanzania is to improve the health and well-being of all Tanzanians, with a focus on those most at risk, and to encourage the health system to be more responsive to the needs of the people. One of the specific objectives is to reduce infant and maternal morbidity and mortality and increase life expectancy through the provision of adequate and equitable maternal and child health services, and to ensure that health services are available and accessible to all people wherever they are in the country, whether in urban or rural areas.

It is well stated in the national health policy that women of child bearing age are the prime targets for health care delivery. Maternal health will continue to be a top priority in health care in Tanzania. Through mothers, children are reached and consequently their health situation will also be improved. Maternal and child health care is a key element in health care delivery. It must be provided in all health facilities throughout the country and women should be provided with care before, during and after giving birth. The health centres should be well equipped and the health personnel should be continuously trained and developed. Tanzania has mainstreamed maternal, newborn and child survival into its national health policy. The services for maternal, newborn and child health are exempted from cost sharing.

1.4.2. The National drug Policy.

In the process of improving the pharmaceutical sector the government of Tanzania endorsed the first National Drug Policy, the Standard Treatment Guidelines and the National Essential Drug List for Tanzania (NEDLIT) in 1991. The STG and NEDLIT were later revised in 1997 and lastly revised in 2007. The MOHSW is currently revising the STG and NEDLIT as well as the NDP. These documents are very important in medicine quantification, procurement and supply to achieve better therapeutic outcomes to the patient.

The overall objectives of the NDP are to make available to all Tanzanians at all times safe, efficacious and quality essential medicines at affordable price to the patient and to their community, in order to prevent, cure or reduce illness and suffering. The NDP provides a framework to coordinate activities by various factors including: the public, private and mission sectors, donors and other interested parties in the pharmaceutical sector.

The Tanzania Food and Drug Authority (TFDA), is responsible for the regulation of medicines and conducts inspections of the private and public drugs outlets in Tanzania.

Tanzania has about 640 registered Pharmacists, 352 Pharmacy Technicians (PT), and 312 Pharmacy assistant (12). The Pharmacy council is responsible for regulating the pharmacy profession and registration of the pharmaceutical personnel in the country.

1.5. The Pharmaceutical Management Cycle

Pharmaceutical management is a set of practices that aims at ensuring the timely availability and appropriate use of safe, effective, quality medicines and related products and services in any health-care setting. The Pharmaceutical management cycle has four components that form a cycle, namely selection of the products, procurement, distribution and its use to the patients (13).

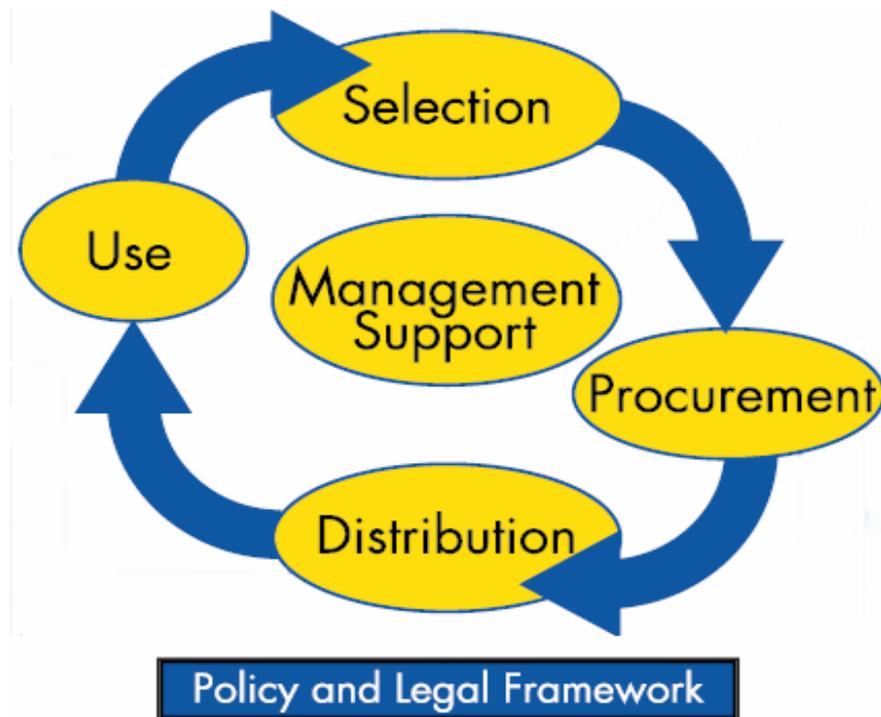


Figure 1: drug management cycle

Source: Management Sciences for Health.

These four components are overseen by the national health policy and legal framework of the country.

Selection

Drug selection is normally done at the national level. The MOHSW through its bodies, policy makers and other stakeholders use the National Essential Medicine List (NEML) and Essential Medicine Formulary (EMF). It can also be done at facility level. The purpose of selecting limited number of essential medicines is that it leads to better supply, more rational use and lower costs.

The selection process normally starts with defining the list of the common disease of a particular community (13). Since selection of emergency obstetric care medicines has

already been done at national level, procurement or ordering from the MSD, store management and dispensing to the patients will be done at the selected health facility.

Procurement

This is one of the component of the pharmaceutical management which deals with forecasting or Quantification of the medicines and all activities that involve preparation of tendering processes, choice of reliable suppliers until the medicines are available for use. An effective drug procurement process ensures the availability of the right drugs in the right quantities, at the reasonable prices, and at recognized standards of quality (13). In Tanzania, MSD is the central agency for procurement and distribution of pharmaceutical products to the public health facilities. Therefore procurement of drugs and medical devices at the health facility level is done from MSD and private pharmacies or agencies.

There are many steps in the procurement process. No matter what model is used to manage the procurement and distribution system, efficient procedures should be in place to:

1. Select the most cost-effective essential drugs to treat commonly encountered diseases; to quantify the needs;
2. Pre-select potential suppliers;
3. Manage procurement and delivery;
4. Ensure good product quality; and
5. Monitor the performance of suppliers and the procurement system.

Failure in any of these areas leads to lack of access to appropriate drugs and to waste. In many public supply systems, breakdowns regularly occur at multiple points in this process.

Distribution

Distribution is the process of supplying commodities, including activities such as transportation and shipping. The primary management goal of any distribution system is to maintain a steady supply of drugs and supplies to facilities where they are needed while ensuring that resources are being used in the most cost effective way. This is achieved through the distribution cycle which has different components including:

1. Port clearing
2. Receipt and Inspection
3. Inventory control
4. Storage
5. Requisition of supplies
6. Delivery
7. Dispensing to Patients
8. Consumption Reporting
9. Drug Procurement

Inventory Control

The purpose of inventory control system is to ensure that the distribution system always contains the right goods in the correct quantities and this through three components:

- a. An inventory management system
- b. A stock control system and,
- c. A performance monitoring system.

Use

The rational use of medicines was defined by WHO as the appropriate consumption of drugs in the appropriate dose, for an adequate period of time and at the lowest cost to patients and their community.

EmOC treatment guidelines has been established in almost all the countries in the world including Tanzania, as well as the STG for emergency obstetric care are well established and distributed to all stakeholders (policy makers, health workers and others). It is

therefore very important to adhere to these guidelines in order to improve the rational use of emergency obstetric care medicines and medical supplies.

1.6 Structure of Medicine Supply in Tanzania

A medicine supply is said to be well functioning when it ensures an un-interrupted supply of essential medicines that are efficacious and of good quality, affordable and rationally used.

In Tanzania, the medicine supply system is assured through a semi-autonomous unit under the ministry of health, the Medical Store Department (MSD), created in 1993.

The Central store and the zonal stores together form an institution known as the Medical Stores Department, which has a governing Board of Trustees (13).

The MSD and its zones therefore supply products to health facilities at the central level i.e. national referral hospitals, regional health facilities, district health facilities, health centers and dispensaries, faith based health facilities, approved non-governmental organizations, armed forces, schools and other training institutions that have medical services within their establishment. However, health facilities do not supply to any lower levels (14).

In supplying medicines to zones and facilities MSD has to procure medicines from manufacturer/ supplier. The procedure of procuring have to follow the Public Procurement Act (15), where different methods are stated including:

1. ICB/ ICT: they publish the tender for a period of 45 days (in order to reach enough people as possible and to give them enough time to prepare themselves).
2. NCB/NCT: national competitive tender, all products from 800 million TSh, and below use NCB, this form of tendering is difficult for medicines but good for services and a disadvantage for local manufacturers, they get 15% domestic preferences.
3. Restricted tendering, here they don't publish the tender, but they deal with prequalified suppliers. E.g.: Anticancer medicines.

Emergency procurement is allowed at MSD

4. Single source method: specifically only one person or one supplier. E.g.: Rosephine.
5. Request for quotation: a minimum of 3 quotations and not more than 800 million TSH.
6. National shopping

The area managers are responsible for ordering at the zonal levels, while at the health facility level, different people procure medicines. This could be the supplies officer, Nursing Officer, Head of Facility, Pharmacist or RCH coordinator depending on the facility in question (9).

Once medicines are received by the facilities from the MSD, the facilities should ensure to have a good inventory system in order to avoid stock outs.

1.7. Problem Statement

Almost 120 million pregnancies occur each year, 15% of all pregnant women will experience life threatening complications during pregnancy or childbirth. Close to half a million women die each year from complications of pregnancy and childbirth; for every woman who die 30-50 more will suffer long term complications and disability related to pregnancy (16).

In Tanzania maternal mortality rate has declined by an estimate rate of only 0.6% since 1990 (31). This is far too little to reach the MDG5 for which an average annual decline of 5.5% between 1990 and 2015 is needed. MMR has remained high in Tanzania because most pregnant women give birth in the absence of a skilled birth attendant, and have no access to medicines and medical supplies for emergency obstetric complications and very few deliveries with expected complications are delivered in an emergency obstetric care facility.

In order to reach the MDG5 the government has a policy that pregnant women should receive free emergency obstetric care services, where drugs and supplies should be available. The review of different articles in Tanzania shows that a lot has been done on EmOC but the component of medicine stock management has not been covered much, therefore our aim was to assess the stock management of EmOC products in public health facilities in Dar es salaam.

1.8. Research Questions.

1. What is the level of availability of emergency obstetric products available in the public health facilities in Dar es salaam?
2. Are emergency obstetric products meeting the demand in the health facilities?
3. What is the percentage of pregnant women who are asked to bring in their own medicines and medical supplies for delivery?
4. Are health care providers knowledgeable on stock management of EmOC products?

1.9. Study Objectives

1.9.1 Broad Objectives

To assess the stock management of emergency obstetric care products in public health facilities in Dar es Salaam region.

1.9.2 Specific Objectives

1. To determine the availability of EmOC products in public health facilities in Dar es Salaam region.
2. To compare the consumption and the stock level of EmOC products.
3. To determine the Proportion of pregnant women who are asked to bring in their own supplies for delivery.
4. To determine the knowledge of healthcare providers on the stock management of EmOC products.

1.10. Rationale of the Study

The purpose of this study was to enlighten the challenges that the pregnant women are facing in public health facilities with regards to supply management of essential medicines, especially those for emergency obstetric complications occurring during labour (severe bleeding, hypertensive disorders, unsafe abortion, obstructed labour with or without rupture of the uterus, and sepsis) which are major causes of maternal mortality worldwide and mostly in sub Saharan countries Tanzania included.

The study has added new and relevant knowledge to the scientific community on the availability of EmOC products. Further it is consistent to the Millennium Development Goal (MDG5) objective of reducing maternal mortality rate.

The study brought about important information for local health policy makers, national drug policy makers, health care providers, donors and other stakeholders involved in medicine sector to effectively monitor and supervise the availability of EmOC products by developing STG only for EmOC and to identify factors (unavailability of medicines at the Medical Store Department (MSD), lack of information on stock availability: stock on hand consumption during the last order period and quantity of the last order); leading to stock outs and poor management of EmOC products.

CHAPTER TWO.

REVIEW OF LITERATURE

Looking out at a research carried out in Pakistan on availability and utilization of emergency obstetric care. The results showed that the number of facilities providing BEmOC was much too low to be called providing CEmOC. A low percentage of births took place in hospitals and few women with complications reached EmOC facilities (17).

Ameh et al (18) conducted a study in Iraq on challenges to the provision of emergency obstetric care. It was reported that, all the 19 hospitals provided parenteral antibiotics and uterine evacuation, 94.7% were able to provide parenteral oxytocics and perform manual removal of retained placenta, magnesium sulphate for eclampsia was available in 47.4% of hospitals, 42.1% provided assisted vaginal delivery, 26.5% provided blood transfusion and 89.5% offered Caesarean section. The identified challenges for health care providers include difficulties travelling to work due to frequent checkpoints and insecurity, high level of insecurity for patients referred or admitted to hospitals, inadequate staffing due mainly to external migration and premature deaths as a result of the war, lack of drugs, supplies and equipment (including blood for transfusion), and falling standards of training and regulation. Most women and their families did not currently have access to comprehensive emergency obstetric care.

Biswas et al (19) conducted a study on the availability and use of emergency obstetric care services in four districts in West Bengal, India and the results show that the numbers of basic and comprehensive EmOC facilities were inadequate in all the four districts compared to the minimum acceptable level. Overall, 26.2% of the estimated annual births took place in the EmOC facilities (ranged from 16.2% to 45.8% in 4 districts) against the required minimum of 15%.

Another study was conducted in Bangladesh in India on the Quality of Obstetric care in Public-sector Facilities and Constrains to Implementing EmOC services. The findings showed that Human-resource constraints were the major barrier for maternal health.

Sanctioned posts for nurses were inadequate in rural areas of both the divisions; however, deployment and retention of trained human resources were more problematic in rural areas of Sylhet. Other problems also plagued care, including unavailability of blood in rural settings and lack of use of evidence-based techniques. The overall supply of medicines was inadequate across all the facilities compared to patient-load (20).

In a study carried out to examine the social and economic consequences for women who had recently delivered with severe complications in Bangladesh, it was reported that three major barriers that influence care-seeking to obtain EmOC and acceptance of surgical procedures.

First, ANC consultations provide little information regarding obstetric complications and medical indications for caesarean section or where to go for emergency care. Second, women have misconceptions about caesarean section and distrust health workers regarding the reasons they recommend the procedure. And third, women who had a caesarean section incurred enormous costs that often led to economic burdens on family members and blame attributed to the woman (21).

Mamady et al (22) carried a research on availability and quality of emergency obstetric care in Gambia's main referral hospital, the results show that the health system inadequacies including lack of blood transfusion, shortages of essential medicines especially antihypertensive drugs led to an inadequate treatment for obstetric emergencies.

In the study conducted in Nigeria on the case of emergency obstetric care in the prevention of maternal mortality, they found out that: Ninety one percent of the maternity unit staff had poor knowledge concerning the concept of EmOC, with no difference in knowledge of respondents across age groups. While consistently more than 60% of staff reported the inclusion of specific client-centered messages such as birth preparedness and warning/danger signs of pregnancy and delivery in the (ANC) delivered to clients, structured observations revealed that less than a quarter of staff actually did this.

Furthermore, only 40% of staff reported counseling clients on complication readiness, but structured observations revealed that no staff did. Only 9% of staff had ever been trained in lifesaving skills (LSS). Concerning strategies for averting maternal deaths, 70% of respondents still preferred the strengthening of routine ANC services in the health facilities to the provision of access to EmOC services for all pregnant women who need it (23).

In a research on measuring access to emergency obstetric care in rural Zambia. Data on medicines and supplies showed that most facilities had I.M penicillin available; few had I.V ampicillin or gentamicin. About a third facilities had oxytocin for treating postpartum haemorrhage, and a quarter had specifically magnesium sulphate for treating eclampsia (24).

Ziraba et al (25) conducted a research on the state of emergency obstetric care services in Nairobi informal settlements and environs, the results from a maternity health facility survey show that: Out of the 25 health facilities, only two met the criteria for comprehensive emergency obstetric care (both located outside the two slums) while the others provided less than basic emergency obstetric care. Lack of obstetric skills, equipment, and supplies hamper many facilities from providing lifesaving emergency obstetric procedures. Accurate estimation of burden of morbidity and mortality was a challenge due to poor and incomplete medical records.

Odimegwu et al (26) conducted a study on Men's Role in Emergency Obstetric Care in Osun State of Nigeria, the results showed that: There was high level of awareness of emergency obstetric conditions by men, particularly in relation to pregnancy signs and labour pains (53.2%). It was also reported that men play useful roles during their partner's obstetric conditions (89.2%). However Women take decisions on health-seeking behaviour during emergency obstetric conditions in the absence of the male partner. Education was therefore found to be the major determinant of this change in male knowledge and behaviour

Nyango et al (27) assessed the skilled attendances of Public Health Care providers in Nigeria and found that only 3 (5.6%) occasionally use pantograph to monitor labour in the facilities, but all require assistant to effectiveness. Usage of uterotonic drugs indicated 25.9% oxytocin, 74.1% ergometrine, while misoprostol was not popular. The quality of

skilled attendance was therefore found to be very low and basic EOC facilities were also lacking a situation further threatened by potential emigration to greener pastures.

Mezie-Okoye et al (28) assessed the status of the availability and performance of Emergency Obstetric Care in Nigeria the findings showed that: No facility qualified as Basic EmOC, while one had Comprehensive EmOC status. Signal functions that required supply of medical consumables were performed by more facilities than services that required special training, equipment and maintenance. Only two facilities (16.67%) had the minimum requirement of more than 4 midwives for 24-hour EmOC service; while only 2.2% of expected births occurred at the facilities

Olsen et al (29) carried out a research on availability, distribution and use of emergency obstetric care in northern Tanzania. The results show that there is a very low availability of BEmOC units and relatively High availability of CEmOC units, both with large urban/rural variation.

The distribution of emergency obstetric care services shows a much higher utilization of EmOC units in urban districts compared with rural, where mothers have to travel long distances to receive adequate services when in need of them. Pregnant women tend to utilize the services of voluntary agencies to a greater degree than government services in rural areas, while the government services have a higher burden of the workload in urban areas. The majority of deliveries occurring in voluntary agency facilities occurs in a qualified EmOC facility.

Sorensen et al (30) conducted a confidential enquiry into maternal deaths at a regional hospital in Tanzania; data was collected using participatory observation and interview with staff, to assess for major substandard emergency obstetric care.

The results show that the cause of deaths were infection 40%, abortion 25%, eclampsia 13%, PPH 12%, obstructed labour 6% and others 4%.

It was reported in a thesis on factors contributing to high maternal mortality rate in Singida region, that the three delays in accessing emergency obstetric care do indeed contribute to

high maternal mortality rate, other factors included illiteracy, low awareness of obstetric danger signs, beliefs and gender barriers to decision, costs of transport and poor road infrastructure; and lastly inadequate funds and weak management of health services also contributed to undermine the availability of quality maternal health services (31).

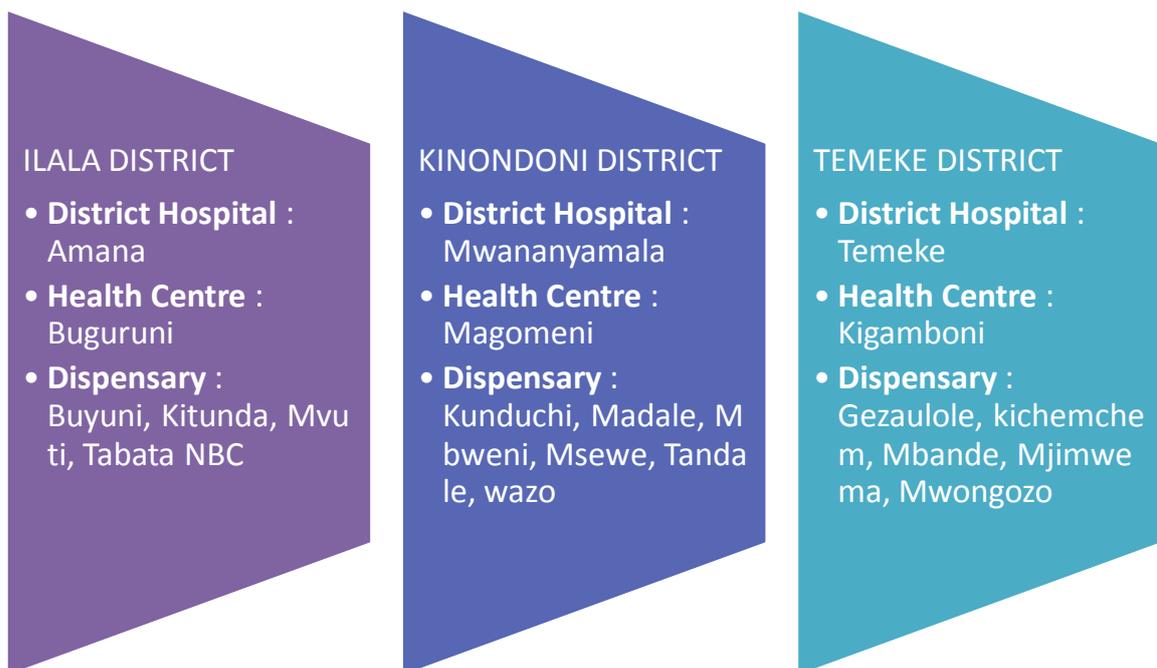
In his study on barriers to conducting effective obstetric audits in Ifakara Hamersveld et al (32) found that insufficient availability of prerequisites, including staff commitment, managerial support and human and materials are barriers to improve health care system, through obstetric audit.

CHAPTER THREE

METHODOLOGY

3.1. Study setting and population

The study was conducted in Dar es Salaam the commercial capital of Tanzania. Administratively this capital city is divided into three (3) municipals namely Ilala, Kinondoni and Temeke. This study was conducted in all the three districts. The districts were chosen to reflect different stages of EmOC services. Facilities providing ANC and POST NATAL services were included in the study; dispensaries, health centres and three of the four municipal hospitals were identified and surveyed.



The study population included all the healthcare professionals working in the drug store, i.e.: pharmacists or drug store managers, clinical officers, nursing officers or assistant nursing officers who were available during the time of study at the health facility, and pregnant women admitted and waiting to give birth and those who visited the facility on the day of our visit.

3.2. Study design

Descriptive cross-sectional study was conducted in all selected public health facilities whereby a review of different records (store ledger books, BIN cards, maternity requisition book, issue voucher and the delivery book), were conducted in order to assess the availability of EmOC products for a review period of three months and on the day of visit at the facilities and consumption of EmOC products in the labour wards for the past three months was also assessed.

An interview of the drug store managers was also conducted in order to assess their knowledge on stock management; pregnant women present at the facility on the day of visit were also interviewed to find out those who were asked to bring in their own supplies for delivery.

3.3. Sampling methods and sample size

The study employed a stratified random sampling technique in selecting public health facilities that were involved in the study. The strata were the three municipalities, Ilala, Kinondoni, and Temeke. The health facilities were stratified according to their levels: primary, secondary and tertiary (dispensary, health centre, and hospital), within each stratum and arranged in an alphabetical order then selected in a systematic random sampling technique and came up with the total of 29 public health facilities out of the 97 public health facilities found in Dar es salaam region (see the list of public health facilities in appendix 9 of this document). 30% of the total number of the public health facilities constituted our sample size for the selected health facilities(as recommended by the UN guidelines for measuring access to EmOC) (33) which was considered as a representative sample for each stratum. But only 21 health facilities met the inclusion criteria (providing antenatal and postnatal services) and were therefore selected as the final sample size of the study. However all the drug store managers (21 drug store managers in total) who were available during the time of the study were interviewed and in order to give equal chances to each of the pregnant women receiving maternal care at the facility to be selected into the study a convenient sampling was considered.

The sample size of this study was calculated using the formula for cross-sectional study:

$$n = \sqrt{z^2 x(100 - x)/\epsilon^2}$$

n = Minimum sample size

z = Point on standard normal distribution curve corresponding to significance level of 5%.

It's value is 1.96

x = prevalence 50% (because no other study of this nature has previously been done).

E = Margin of error on x (set at 2.5%).

After calculations it was found that n=553 for the pregnant women.

The tracer products were chosen in accordance to the recommendations of MSH, WHO whereby it is advised to have at least 25 to 30 tracer products when assessing the availability of EmOC products using IMAT Tool. (47) (Appendex 6).

3.4. Data collection tools, approaches and procedures

Data were collected between April and May 2013, after obtaining consent from the study participants. However this was preceded by a brief explanation of the study objectives to the interviewees. Consented candidates were interviewed using structured questionnaires.

The following tools and approaches were used in the course of data collection:

Field survey of selected health facilities using Inventory Management Assessment Tool (IMAT) of the MSH a well validated tool used to assess availability of tracer products for the past three months, at the surveyed facilities.

This tool has indicators to assess the effectiveness of record keeping and stock management practices in a warehouse, health facility or any other institution that manages stock and provides suggestions for improvement. This tool was used to collect data based on the stock levels of a group of representative EmOC products over a period of three (3) months (January to March 2013). Out of four indicators in this tool which are based on the pharmaceutical logistics indicators detailed in the MSH guide(Rapid Pharmaceutical Management Assessment: An Indicator Based Approach). We used only two indicators: (indicator number 3 and indicator number 4) for monitoring stock levels in accordance to

our study topic. Details on how to use the indicators are found in the appendix 6 of this document. The physical assessment of the availability of EmOC products was conducted in the public health facilities in three municipalities within Dar es Salaam namely Ilala, Kinondoni and Temeke, by stratifying the public health facilities into three levels : primary level (dispensaries) , secondary level (health centres) , and tertiary level (district hospitals); a total sample of 25 public health facilities were then randomly selected but 4 were found not to provide antenatal and post natal services so they were not included into the study. The IMAT was also used to calculate the day products were out of stock for the past three (3) months at the surveyed health facilities.

Medicine availability was also measured by physical count of the list of 23 essential medicines considered necessary for emergency obstetric complications and 7 medical supplies all derived from a list of essential Maternal, Newborn and Child Health Medicines, Equipment and Supplies compiled by the RCH department at the MOHSW. A total of 30 tracer products on a check list shown at the appendix3 of this document were therefore used to assess the availability of EmOC products on the day of visit to the selected health facilities. The physical count was completed by double checking the products that were previously out of stock by using the medicine ledger (which normally is used to track supplies of medicines in health facilities and to keep an overview of the medicine inventory).

Only quantitative approach was used in the process of assessing the availability of emergency obstetric care products in public health facilities as well as the consumption of EmOC products in the labour wards.

A review of different records (BIN cards, store ledger books, material requisition voucher and delivery books) available in the stores was conducted in order to compare the consumption of EmOC products in the labour wards with the stock levels at the main stores.

Adequate storage conditions of medicines and medical supplies was assessed using a check list (attached at the appendices 4 and 5 of this work) in order to find factors that could affect the quality and efficacy of EmOC products stored in the maternity wards storage areas. We adapted the check list from the WHO indicators whereby 15 questions were

adopted and the average score was calculated from each column results so that it could fit to our study. The following score chart was used:

Table 3.2. Score chart for the storage conditions in the labour wards.

Percentage (%)	Score
75 – 100	Very Satisfactory
50 – 74	Satisfactory
25 – 49	Dissatisfactory
0 – 24	Very Dissatisfactory

The pregnant women were interviewed with help of a different set of questionnaires (found at the appendix 2 of this work) to find out those who were asked to bring in their own supplies for delivery at the health facility.

A set of 10 structured questionnaires (found in the appendix 1 of this work) was used to interview drug store managers on their knowledge on stock management; apart from the demographic characteristics, zero (0) point was given for an incorrect answer and one (1) for a correct answer then the level of knowledge was graded in accordance to the number of questions (ten questions) which were then graded according to the score as presented in the table shown below:

Table 3.1 Knowledge score chart for the drug store managers.

Percentage score based on the numbers of questions.	Knowledge level
0 – 24	Very poor
25 – 49	Poor
50 – 74	Good
75 – 100	Very good

3.5. Inclusion criteria

Public health facilities where antenatal and postnatal services were available.

Healthcare professional in-charge of the facility main store and the labour ward sub-store.
i.e.: Pharmacists, Clinical officers, Nursing offices or assistant nursing officer.

Pregnant women who were admitted waiting to give birth and those who were present at the facility on the day we visited the facility.

3.6. Exclusion criteria

Those who did not want to participate in the study.

Pregnant women who had parity level one were not included in this study.

3.7. Study variables

3.7.1. Dependent variables

- Availability of EmOC products,
- Stock levels of medicines.
- Storage conditions of EmOC products in the labour wards.
- Pregnant mothers who were asked to bring in their own supplies for delivery.
- Knowledge of health facility store personnel on stock management of EmOC products.

3.7.2. Independent variables

- Age of respondents,
- Sex of respondent
- Marital status,
- Level of education of the respondent
- Occupation of the respondents.
- Experience in working at the store
- Parity level

3.8. Data Analysis.

At the end of each working day, completed copies of questionnaires were checked for consistency of response. Any irregularity noted was brought to the attention of the interviewer. The questionnaires being open ended, we had to go through all the responses, list all the sentences or answers that are different, collapse or merge them in order to get at least 5 answers which were then coded according to the objective of the question and finally they were entered, cleaned, coded into the SPSS version 20.0 data base and analyzed by the same software in order to obtain our results in terms of frequency distribution tables or histograms.

The analysis of the data was accomplished by using the computer software Statistical Package for social sciences (SPSS) version 20.0 and this in order to:

- a. Determine the proportion of EmOC products available in public health facilities. The availability of EmOC products on the day of visit where we used a list of tracer products was analyzed by the software SPSS version 20, in order to find the percentage of products that was available at different health facilities, we went further checking for any significant differences in the availability of EmOC products with regards to the levels of public health facilities by using a chi square test where we considered the level of significant ($p\text{-value} < 0.05$), then we did further analysis to rule out any confounding factors in the significant levels so we did Fischer's exact test and we corrected by the Bonferroni adjustment where we multiplied the Fischer's exact test $p\text{-value}$ by 3 (number of pairs to be analyzed) and considered the cutoff point of $p\text{-value} < 0.05$ as a significant for the Bonferroni adjustment.
- b. Compare the consumption and the stock level of EmOC products in the labour wards.
- c. Determine the proportion of pregnant women who were asked to bring in their own supplies and those who were not able to bring in their own supplies for delivery.
- d. Determine the proportion of drug store managers and nurses in charge of the labour wards who are knowledgeable about the stock management of EmOC products.

The availability of EmOC products for a review period of three months was analyzed by using the Inventory Management Assessment Tool.

3.9. Study limitation

Data availability was a major concern. Physical count was more reliable as compared to available records. Thus the availability of EmOC products could not be analyzed by the IMAT tool for the lower level of the health facilities (dispensaries) because of poor record keeping systems at the facilities.

3.10. Ethical clearance

Ethical clearance was obtained from the Ethical Review Committee of the Muhimbili University of Health and Allied Sciences (MUHAS). The investigator required permission from respective Municipal Authorities prior to visiting the selected public health facilities. Finally consent was received from participants before enrolling them into the study.

CHAPTER FOUR

4.0. RESULTS

Results have been categorized into two main parts namely results from the reviewed records and from the interview questionnaires.

4.1. Results from the records.

4.1.1. Availability of EmOC products by using a list of 30 tracer products on the day of visit.

After running the frequency tables for the availability of emergency products in public health facilities, it was found that there was a low availability of parental uterotonic which are very important for the treatment of postpartum hemorrhage in the course of preventing maternal death and this by 19% (4/21), followed by parenteral antibiotics for the treatment of infections (sepsis) by 23.8% (5/21) and parenteral anticonvulsants for the treatment of eclampsia by 33.3% (7/21), while most anti anemic drugs were seen to be present by 66.7% (14/21) at the health facilities and medical supplies showed a significant low availability as well.

Table 4.1.1.1: Proportions of tracer EmOC products available in surveyed health facilities on the day of visit. (n=21).

Products	Number of health facilities	Percent (%)
Parenteral Antibiotics		
Benzanthine Penicillin	3	14.3
Benzyl Penicillin	10	47.6
Procain Penicillin Forte	8	38.1
Metronidazol injection	5	23.8
Chloramphenicol injection	1	4.8
Erythromycin injection	1	4.8
Parenteral Uterotonics		
Ergometrin	1	4.8

Misoprostol	1	4.8
Oxytocin	7	33.3
Parenteral Anticonvulsants		
Diazepam injection	7	33.3
Hydralazine	0	0
Magnesium sulfate	8	38.1
Anti anemic		
Iron + folic acid	15	71.4
Hemovit	14	66.7
Ferrous sulfate	10	47.6
Folic acid	10	47.6
I.V Solutions		
Dextrose 5 %	18	85.7
Glucose 50 %	10	47.6
Normal saline	14	66.7
Ringer lactate	13	61.9
Water for injection	19	90.5
Local anesthetics		
Adrenalin injection	15	71.4
Lignocaine 2 %	14	66.7
Medical supplies		
Catgut chromic	6	28.6
Cotton wool	21	100
Gloves	7	33.3
Surgical blade	9	42.9
Syringe + needle	11	52.9
Umbilical cord tie	6	28.6
Spirit	21	100

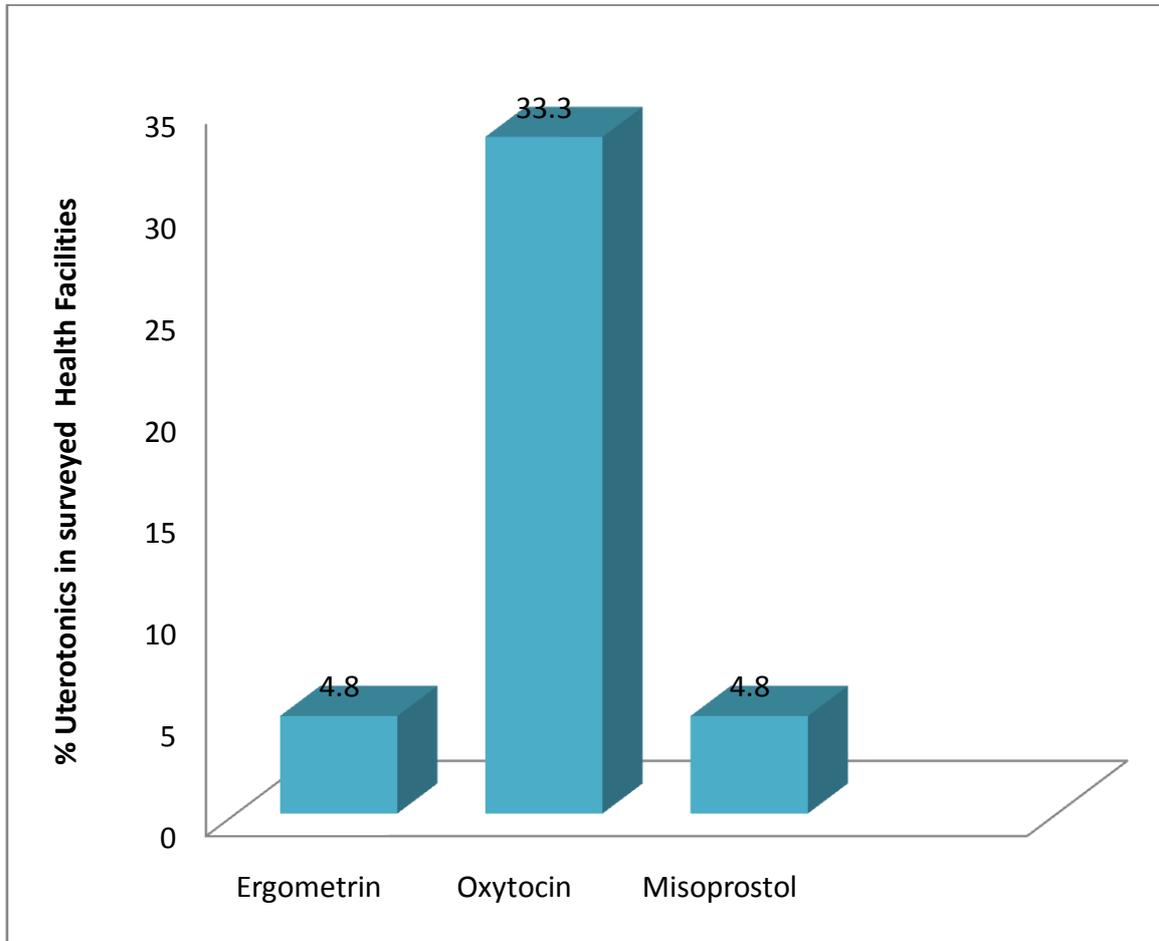


Figure 4.1.1.1: Availability of Parenteral Uterotonics in surveyed health facilities

In general the availability of parenteral uterotonics was very low in all public health facilities surveyed; Oxytocin was found to be available by 33.3 % , while Misoprostol and Ergometrin were almost not available at all public health facility levels. See table 4.1.1.2 below:

Table 4.1.1.2: Percentage of parental Uterotonics across health facility levels

	District hospital	Health centre	Dispensary
Ergometrin	33.3%	0	0
Misoprostol	0	0	6.7%
Oxytocin	100%	0	26.7%

We did a cross tabulations to see if there was any significant differences in the availability of EmOC across different levels of the public health facilities, it was found that there was indeed a very significant variations in the availability of EmOC products across different levels of the public health facilities. See the table 4.1.1.3 below:

Table 4.1.1.3: Differences in the availability of EmOC product across surveyed health facilities.

Medicines	Hospital	Health centre	Dispensary	P-value
Benzanthine penicillin	0.0 %	33.3 %	14.3 %	0.497
Benzyl penicillin	100 %	100 %	26.7 %	0.01
PPF	100 %	100 %	33.3 5	0.03
Metronidazole inj.	100 %	33.3 %	6.7 %	0.002
Ergometrin	33.3 %	0.0 %	0.0 %	0.04
Misoprostol	0.0 %	0.0 %	6.7 %	0.81
Oxytocin	100 %	0.0 %	26.7 %	0.02
Diazepam inj.	66.7 %	100 %	13.3 %	0.006
Magnesium sulphate	100 %	100 %	13.3 %	0.001
Dextrose 5 %	0.0 %	100 %	100 %	0.000
Normal saline	66.7 %	66.7 %	66.7 %	1.000
Ringer lactate	0.0 %	100 %	66.7 %	0.032
Lignocaine 2 %	66.7 %	100 %	60.0 %	0.407

After these findings we considered further analysis to find the Associations between the availability of EmOC products with regards to different levels of the public health facilities surveyed in order to exclude any confounding factors influencing the differences in the availability of EmOC products observed across each level of public health facilities, we therefore analyzed further by using pair wise analysis and considered Fischer's exact test and for the P-value we corrected by Bonferroni adjustment test whereby we multiplied Fischer's P-value by 3 since we had 3 pairs (Hospital – Health centre ; Health centre –

Dispensary ; and Dispensary – Hospital) to analyze. It should be noted that the cut-off for the p-value is < 0.05 to be considered significant. See tables 4.1.1.4, 4.1.1.5, and 4.1.1.6 below:

Table 4.1.1.4: Differences of EmOC products availability between surveyed hospitals and health centers.

Product name	Number		Fischer's test	Bonferroni test
	Hospital	Health centre	P-value	P-value
Benzanthine penicillin	0	1	1	-
Benzyl penicillin	3	3	-	-
Ergometrin	1	0	1	-
Misoprostol	0	0	-	-
Oxytocin	3	0	0.1	0.3
Diazepam inj.	2	3	1	-
Hydralazine	0	0	-	-
MgSO ₄	3	3	-	-
Dextrose 5%	0	3	0.1	0.3
Normal saline	2	2	1	-
Ringer lactate	0	3	0.1	0.3
Lignocaine 2%	2	3	1	-

Table 4.1.1.5: Differences of EmOC products availability between surveyed health centers and dispensaries.

Product name	Number		Fischer's test	Bonferroni test
	Health centre	Dispensary	P-value	P-value
Benzanthine penicillin	1	2	0.4	1.2
Benzyl penicillin	3	4	0.04	0.12
Ergometrin	3	5	0.06	0.18
Misoprostol	0	1	1	-
Oxytocin	0	4	1	-
Diazepam inj.	3	2	0.01	0.03
Hydralazine	0	0	-	-
MgSO4	3	2	0.01	0.03
Dextrose 5%	3	15	-	-
Normal saline	2	10	1	-
Ringer lactate	3	10	0.5	1.5
Lignocaine 2%	3	9	0.5	1.5

Table 4.1.1.6: Differences of EmOC product availability between surveyed dispensaries and hospitals.

Product name	Number		Fischer's test	Bonferroni test
	Dispensary	Hospital	P-value	P-value
Benzanthine penicillin	2	0	1	-
Benzyl penicillin	4	3	0.04	0.12
Ergometrin	5	0	0.5	1.5
Misoprostol	1	0	0.1	0.3
Oxytocin	4	3	0.04	0.12
Diazepam inj.	2	2	0.1	0.3
Hydralazine	0	0	-	-
MgSO4	2	3	0.01	0.03
Dextrose 5%	15	0	0.001	0.003
Normal saline	10	2	1	-
Ringer lactate	10	0	0.06	0.18
Lignocaine 2%	9	2	1	-

The results in the table 4.1.1.6, showed that there was a significant association between the availability of certain EmOC products (Diazepam injection, Dextrose 5% I.V solution and Magnesium sulfate) with regards to different health facility levels.

4.1.2: Availability of EmOC products by using Inventory Management Assessment Tool (IMAT) within a review period of three (3) months.

The average percentage time (days) products were found to be in stock was 41.3% in the hospitals and 17.3% in the Health centres.

The results showed that the average % time that EmOC products were out of stock was higher in health centres 53.7% than in the Hospitals 41.7%.

Views and Perceptions of drug store managers on the factors leading to the unavailability and stock out of EmOC products.

Facility staffs with different professional qualifications (pharmacists, clinical officers, nursing officers etc.) were asked for their views on the situation regarding the availability of Emergency Obstetric products the main reasons that they gave was mainly challenges and problems they face when ordering from MSD, as well as the time it takes from ordering to receiving the products. See the figures 4.1.2.1 and 4.1.2.2 below:

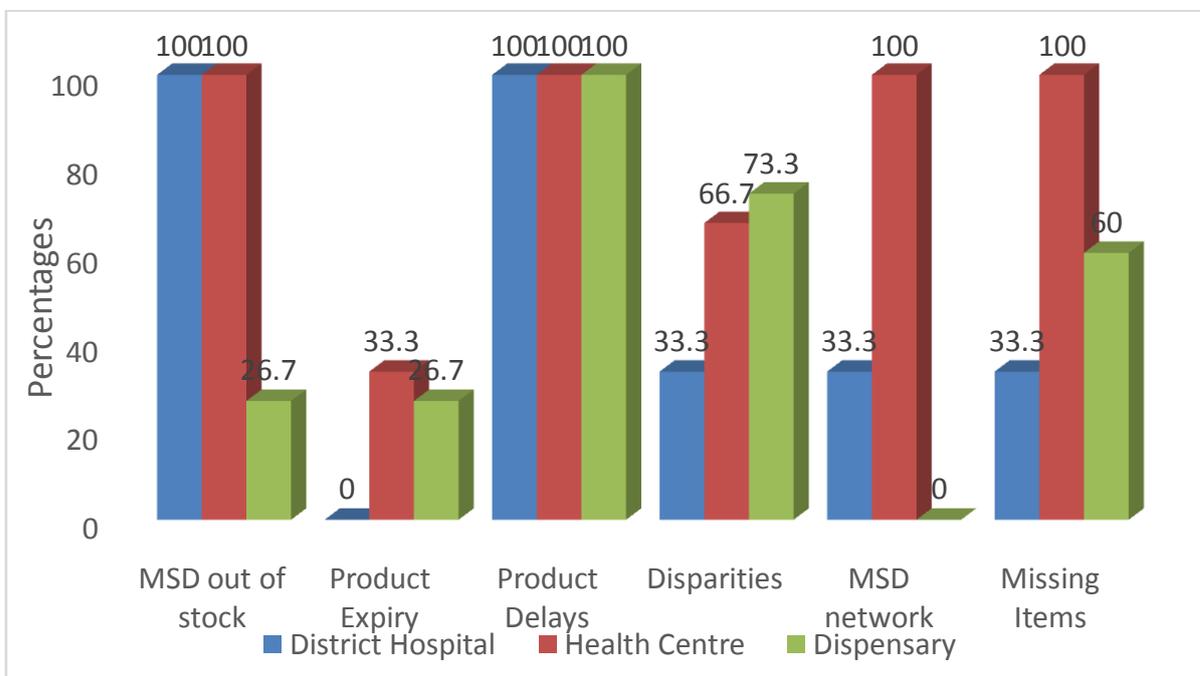


Figure 4.1.2.1: Challenges or problems faced by health facilities when ordering from MSD

The results revealed that almost at all levels of the health facilities they face almost the same challenges when ordering products from MSD and these challenges were: MSD being always out of stock for the required items, Products delaying to be delivered at the facility. Product disparities (where by you order other items but you receive completely different items from the ones you ordered), and Missing items. Other challenges such as product expiry were faced at the health centres and dispensary, while the problem of the electronic system of the MSD was seen at the district hospitals and the health centres.

The average product lead time was 1 – 2 month at all levels of the health facilities, with more increased time in dispensaries which could wait for more than 5 months for the products to be delivered. See figure 4.1.2.2 below. *This is the case we observed at GEZAULOLE, MJIMWEMA AND MWONGOZO DISPENSARIES which are all located in TEMEKE district.*

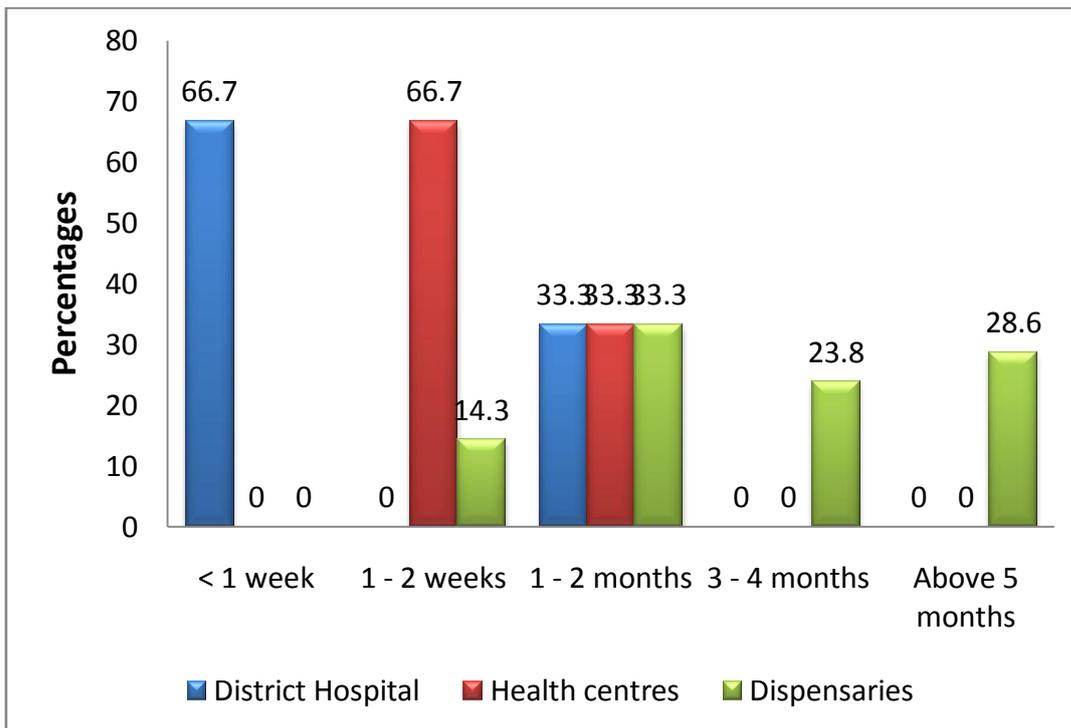


Figure 4.1.2.2: Average time between ordering and receiving products.

4.1.3. Results on the actual consumption of EmOC products in the labour wards as per observed records for a review period of three (3) months.

Table 4.1.3.1: CONSUMPTION OF EmOC PRODUCTS FROM JANUARY TO MARCH 2013 AT AMANA HOSPITAL

Products	Ordered	Received	Consumed
Oxytocin injection	13,200	10,690	8,245
Magnesium sulfate	650	350	120
Ampicillin injection	450	215	98
Benzyl penicillin	500	320	43
Lignocaine 2 %	200	110	80
Ringer lactate	1772	2328	1050
Normal saline	3260	2118	897
Dextrose 5 %	860	816	294

At AMANA hospital, it was found that more products were ordered, but not all the ordered products were received from the pharmacy, therefore when issuing to the patients in the labour wards the nurses had to do rationing of the products.

Table 4.1.3.2: CONSUMPTION OF EmOC PRODUCTS FROM JANUARY TO MARCH 2013 AT MWANANYAMALA HOSPITAL

Products	Ordered	Received	Consumed
Oxytocin	7500	5750	72
Magnesium sulfate	275	135	30
Ampicillin injection	150	105	96
Benzyl penicillin	165	243	96
Lignocaine 2 %	206	76	-
Ringer lactate	2618	1913	-
Normal saline	596	233	-
Dextrose 5 %	250	135	-

Note: it should be noted that the consumption at the labour ward at this hospital was expressed in terms of the frequency that the patients received the drugs and not in terms of quantities that they received, and the ----- indicates no records on the consumptions of these products.

Table 4.1.3.3: CONSUMPTION OF EmOC PRODUCTS FROM JANUARY TO MARCH 2013 AT TEMEKE HOSPITAL

Products	Ordered	Received	Consumed
Oxytocin	7450	6000	6420
Magnesium sulfate	240	75	70
Ampicillin injection	400	400	245
Benzyl penicillin	50	o / s for two months	50
Lignocaine 2 %	100	97	90
Ringer lactate	1466	1320	1034
Normal saline	600	192	217
Dextrose 5 %	312	108	244

At TEMEKE hospital it was observed that Oxytocin was consumed more in the labour wards than what was received from the drug store. These surpluses in the consumption of Oxytocin could be explained by the fact that the products that pregnant women are asked to bring in are not recorded in any of the books in the labour wards.

When we considered following up consumption of EmOC products within a week in the month of March 2013 from the register books this is what we found:

Table 4.1.3.4: CONSUMPTION OF EmOC PRODUCTS WITHIN A WEEK AT AMANA HOSPITAL

Date	Product name	Required	Received	Consumed
05/03.2013	Oxytocin	300	200	90
	Ringer lactate	-	-	10
	Normal saline	-	-	7
	Dextrose 5%	-	-	5
	Lignocaine 2%	-	-	2
	Benzyl penicillin	-	-	3
06/03/2013	Oxytocin	200	100	100
	Ringer lactate	48	24	11
	Normal saline	48	24	7
	Diazepam inj.	-	40	-
07/03/2013	Oxytocin	1000	800	120
	Ringer lactate	192	144	16
	Normal saline	120	72	15
	Benzyl penicillin	100	100	30
	Ampicillin inj.	100	50	40
	Lignocaine 2%	-	-	2
08/03/2013	Ringer lactate	-	-	12
	Normal saline	-	-	5
	Oxytocin	-	-	80
09/03/2013	Oxytocin	-	-	90
	Ringer lactate	-	-	10
	Normal saline	-	-	4
10/03/2013	Ringer lactate	-	-	12
	Normal saline	-	-	6
11/03/2013	Oxytocin	200	100	100
	Ringer lactate	96	48	15
	Normal saline	96	24	7

It was found that in a week for example oxytocin is received in a smaller quantity than that ordered from the drug store and therefore when dispensing to the patients in the labour wards it has to be rationed so that they do not completely run out of stock.

Table 4.1.3.5: CONSUMPTION OF EmOC PRODUCTS WITHIN A WEEK AT MWANANYAMALA HOSPITAL

Date	Product name	Required	Received	Consumed
01/03/2013	Oxytocin	300	200	Yes
	Benzyl penicillin	20	5	Yes
	Ringer lactate	144	96	Yes
	Normal saline	48	o/s	Yes
05/03/2013	Benzyl penicillin	20	6	Yes
	Ringer lactate	120	72	Yes
	Normal saline	12	o/s	Yes
	Oxytocin	300	300	Yes
08/03/2013	Benzyl penicillin	10	4	Yes
	Oxytocin	300	300	Yes
	Ringer lactate	96	72	Yes
	Normal saline	12	12	Yes

At MWANANYAMALA hospital it was once again difficult to tell the exact quantities of the products given to the patients in the labour wards, because their record keeping system does not give numbers but only tells if the patient received an emergency obstetric care product yes or no.

Table 4.1.3.6: CONSUMPTION OF EmOC PRODUCTS WITHIN A WEEK AT TEMEKE HOSPITAL

Date	Product name	Required	Received	Consumed
01/03/2013	Ringer lactate	48	24	24
	Normal saline	24	o/s	-
	Oxytocin	300	200	150
04/03/2013	Oxytocin	300	200	240
	Ringer lactate	96	o/s	-
	Normal saline	48	o/s	-
	Benzyl penicillin	50	50	25
07/03/2013	Oxytocin	400	200	413
	Ringer lactate	72	48	96
	Normal saline	24	o/s	-

At TEMEKE hospital on the other hand, it was found that in a week more oxytocin and ringer lactate was consumed in the labour wards than the quantity received from the drug store.

VIEWS / PERCEPTIONS OF THE MATERNITY STORE MANAGERS ON THE CONSUMPTION OF EmOC PRODUCTS IN THE MATERNITY WARDS.

Most Assistant nursing officer in – charge of the medicines in the labor wards in District Hospitals reported that when such situations i.e. out of stock of at least one EmOC products occurred at the facility they report to the Matron (nursing officer in – charge of the labor ward) , whereas the Health Centres they either report to the Pharmacist, Use the Cost Sharing Money or they Borrow from another facility; at the Dispensary level it was seen that they asked the Patient to buy the required medicines or else they Use the Cost Sharing Money. See figure 4.1.3.1 below:

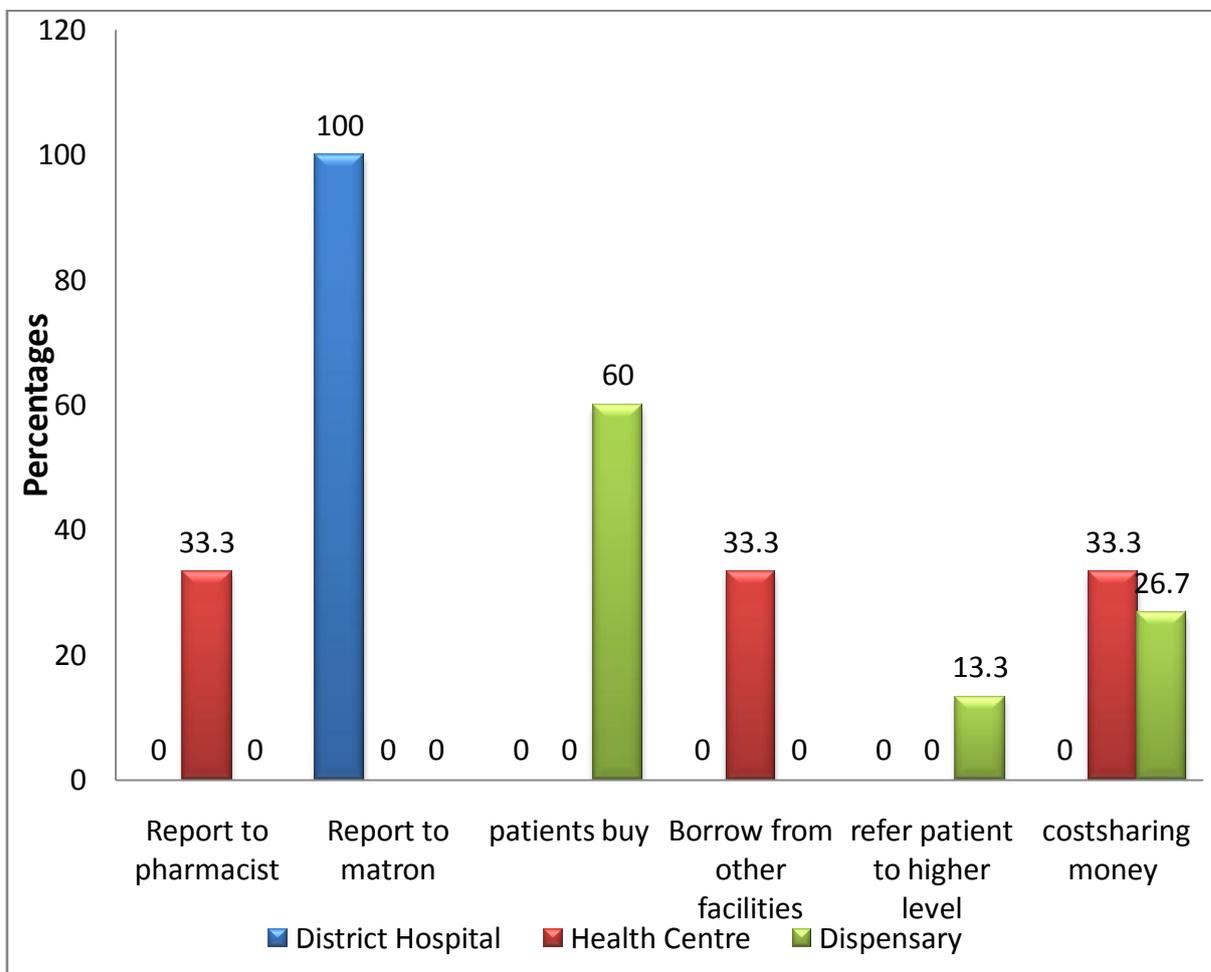


Figure 4.1.3.1: Procedures undertaken at the labour ward in case of stock out of EmOC products.

It is seen that in such situations where by the nurse orders from the main store and gets less drugs or do not get at all ; at the hospital level as well as at the dispensary level they either use the cost sharing money, report to the matron or they reorder before the ordering time has arrived. At the health centres they place another order for the product before the ordering time. See figure 4.1.3.2 below:

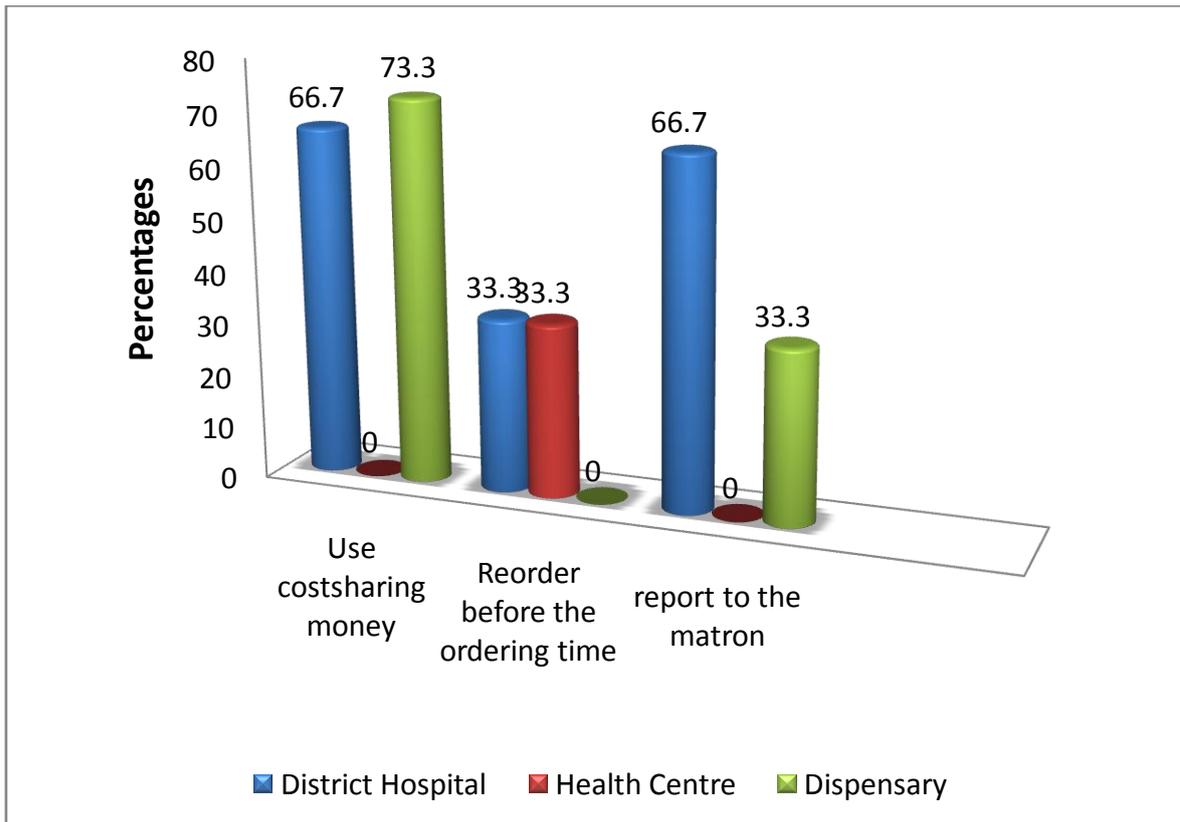


Figure 4.1.3.2: Actions taken when the nurse misses a product from the facility main store.

The results revealed that when the products are completely used at the maternity ward the nurse shows the ledger book to the pharmacist or drug store manager in order for him to confirm, while at the health centre levels the nurse shows the ledger book, tells him/her verbally or uses the report and request form. The lowest level of the health facility operates differently in a sense that the nurse either uses the report and request form or tells the drug store manager verbally about the consumption of drugs in the labour ward. See figure 4.1.3.3 and 4.1.3.4, below:

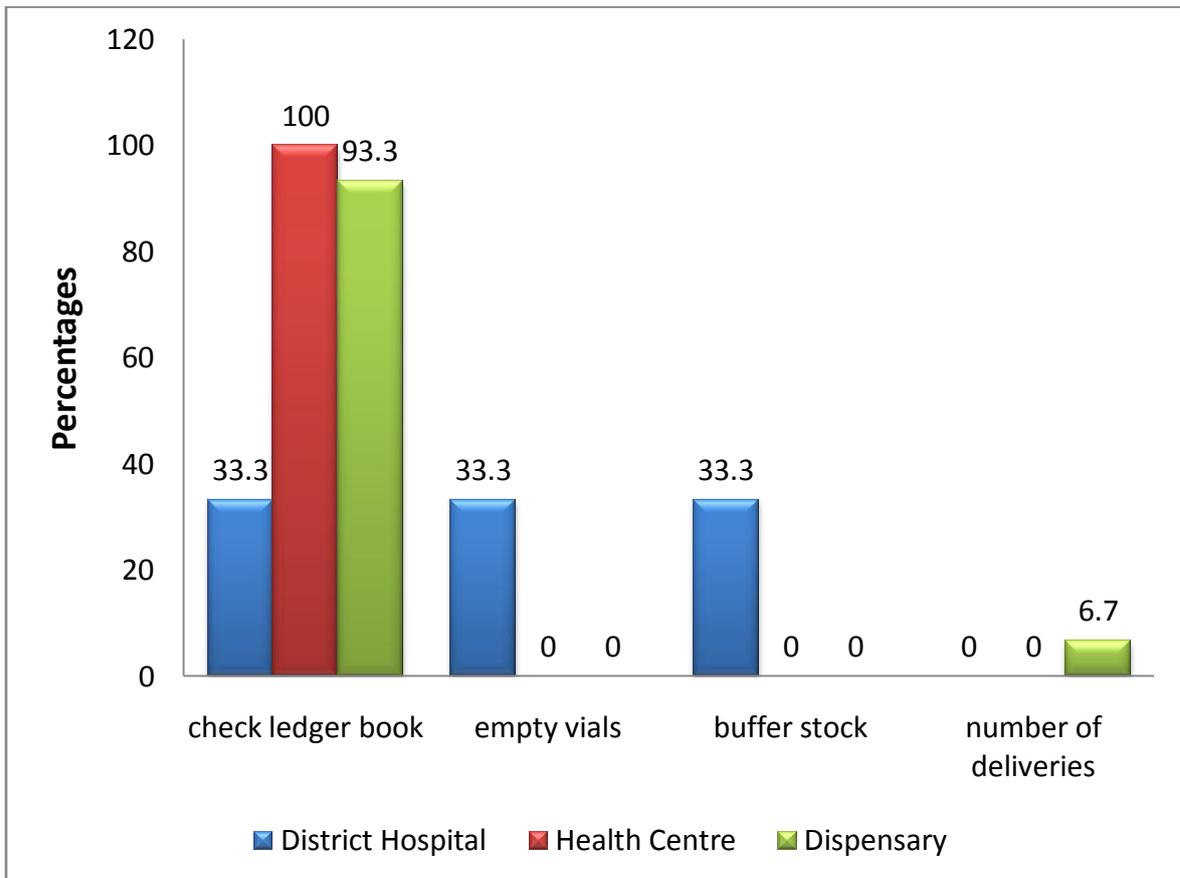


Figure 4.1.3.3: Follow up on consumed items in the labour ward by the store manager.

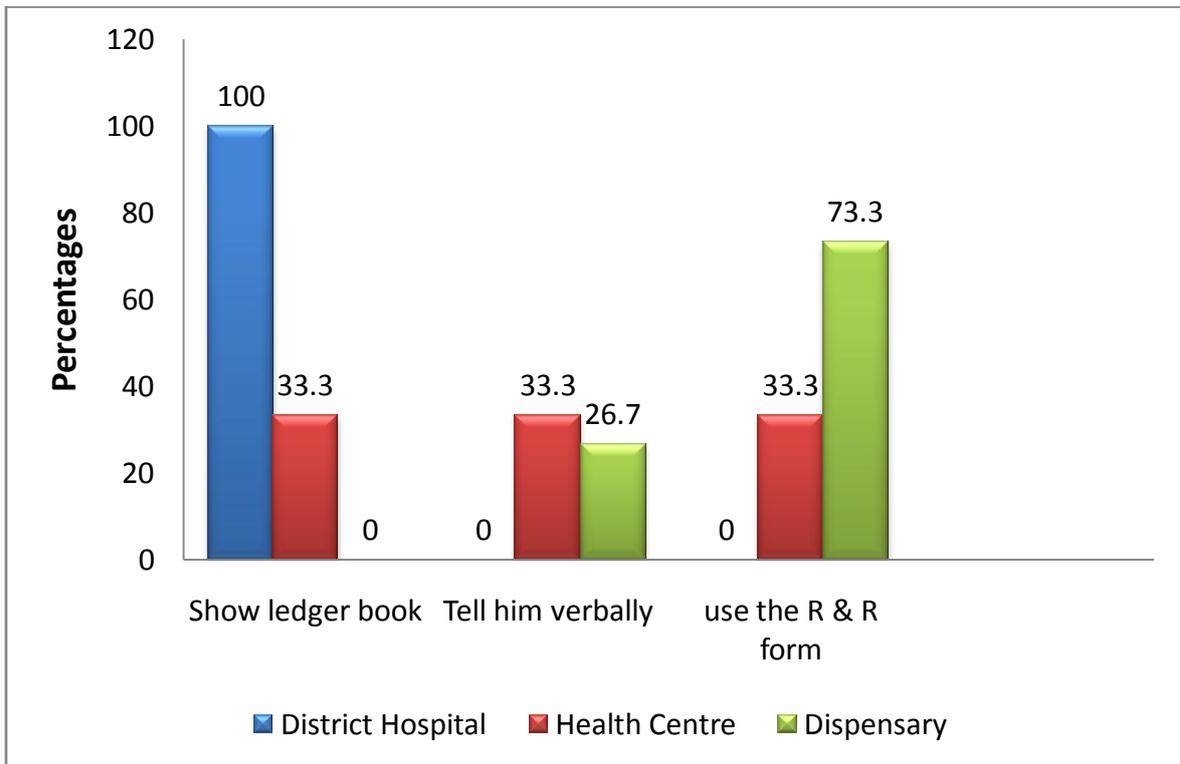


Figure 4.1.3.4: Means of information used by the nurses to communicate with the main store manager/pharmacist on consumed items in the labour wards.

It was found that in order for the drug store managers to issue medicines to the labour wards, all the three levels of the facilities they use the store issue voucher but at the two lower levels i.e.: health centres and dispensaries they used more the maternity ward ledger books for this purpose.

4.2. Storage Conditions

4.2.1. Adequate Conservation Condition at the Facility Main Drug Store.

Table 4.2.1.1: Storage conditions in the surveyed facility main store.

Characteristics	Number	Percent (%)
Identification labels and expiry dates can be seen	15	71.4
FEFO / FIFO systems	10	47.6
Products not crushed	15	71.4
Damaged / expired products are separated from usable ones	15	71.4
Protections from direct sunlight	17	81
Protection from humidity / water	10	47.6
Store area free from insects / rodents	17	81
Store room with key and lock	20	95.2
Products stored at appropriate temperature	11	52.4
Roof maintained to avoid direct sunlight / water penetration	16	76.2
Store room clean, no trashes, shelves sturdy	5	23.8
Current space sufficient for existing products	4	19
Products 10cm off floor	6	28.6

Products 30 cm away from wall	8	50
Products not more than 2.5 cm high	14	66.7
Fire equipment available and accessible	1	4.8
Products separated from chemicals	17	81
Refrigerator present	11	52

The table 4.2.1.1 above shows the check list of the characteristics which were used to assess the storage conditions at the facilities main drug stores.

Figure 4.2.1.1: Illustrations of the storage conditions in the public health facilities.



4.2.2. Adequate conservation conditions and handling of medicines and medical supplies at the labour wards.

Table 4.2.2.1: Check list used for the assessment of the storage conditions in the labour wards sub store.

Variables in check list	Number	Percent (%)
1. Identification labels visible	2	9.5
2. Products are arranged systematically (alphabetically, pharmacologically, etc.)	1	4.8
3. Products not directly on the floor	5	23.8
4. Products on a metallic tray	9	42.9
5. Products protected from direct sunlight	1	4.8
6. Area free from moisture	10	47.6
7. Windows can be opened	9	42.9
8. Area free from insects/rodents	7	33.3
9. Expired products separated from usable ones	10	47.6
10. Store room clean	6	28.6
11. Current space sufficient	4	19.0
12. Presence of cold storage with temperature chart	1	4.8
13. Fire safety equipment available and accessible	3	14.3
14. Products separately from chemicals	3	14.3

Table 4.2.2.2: Adequate storage conditions in the labour wards at the surveyed health facilities

S/N	% Average score			Score status		
	Hospital	H . centre	dispensary	Hospital	H . centre	Dispensary
1	33.3	0	6.7	D	V.D	V.D
2	33.3	0	0	D	V.D	V.D
3	66.7	66.7	6.7	S	S	V.D
4	33.3	0	0	D	V.D	V.D
5	100	33.3	40	V.S	D	D
6	33.3	33.3	46.7	D	D	D
7	100	66.7	13.3	V.S	S	V.D
8	100	66.7	33.3	V.S	S	D
9	33.3	33.3	26.7	D	D	D
10	100	0	6.7	V.S	V.D	V.D
11	0	0	0	V.D	V.D	V.D
12	33.3	0	0	D	V.D	V.D
13	100	0	0	V.S	V.D	V.D
14	100	0	0	V.S	V.D	V.D
Average score	41.3	14.3	8.6	D	V.D	V.D

Legend:

1. **V.S = very satisfactory**
2. **S = satisfactory**
3. **D = dissatisfactory**
4. **V.D = very dissatisfactory**

S/N: Each number is equivalent to the variable for the storage condition.

It was observed that at some labour wards at the lowest levels of health facilities mainly dispensaries despite of having electricity problems, and the space being not sufficient for

existing products; Oxytocin was found to be stored either directly on the floor, in metallic trays or in cool boxes which uses gas as a source of power. See figure 4.2.2.1 below :

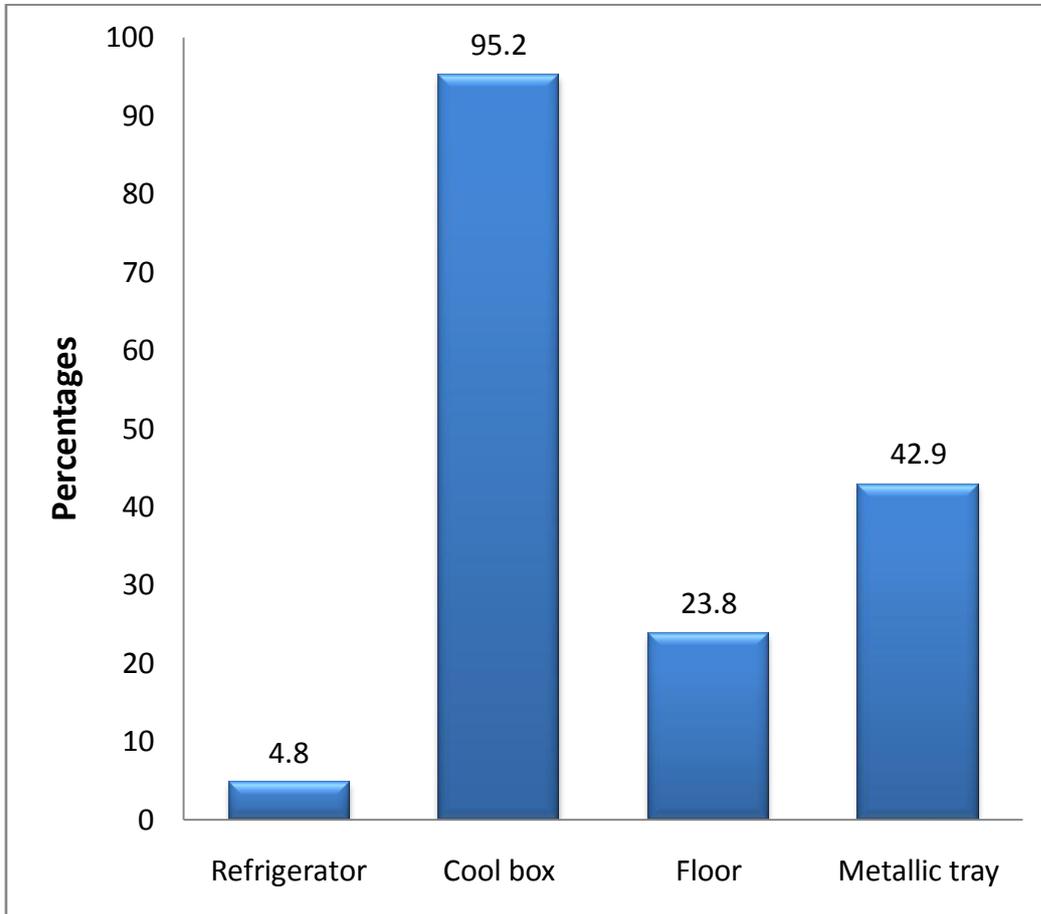


Figure 4.2.2.1: Observed storage conditions for Oxytocin in the surveyed Dispensaries.

The results revealed that the storage condition at the labour ward was dissatisfactory at the hospital levels as compared to the health centre and dispensary levels where it was very dissatisfactory.

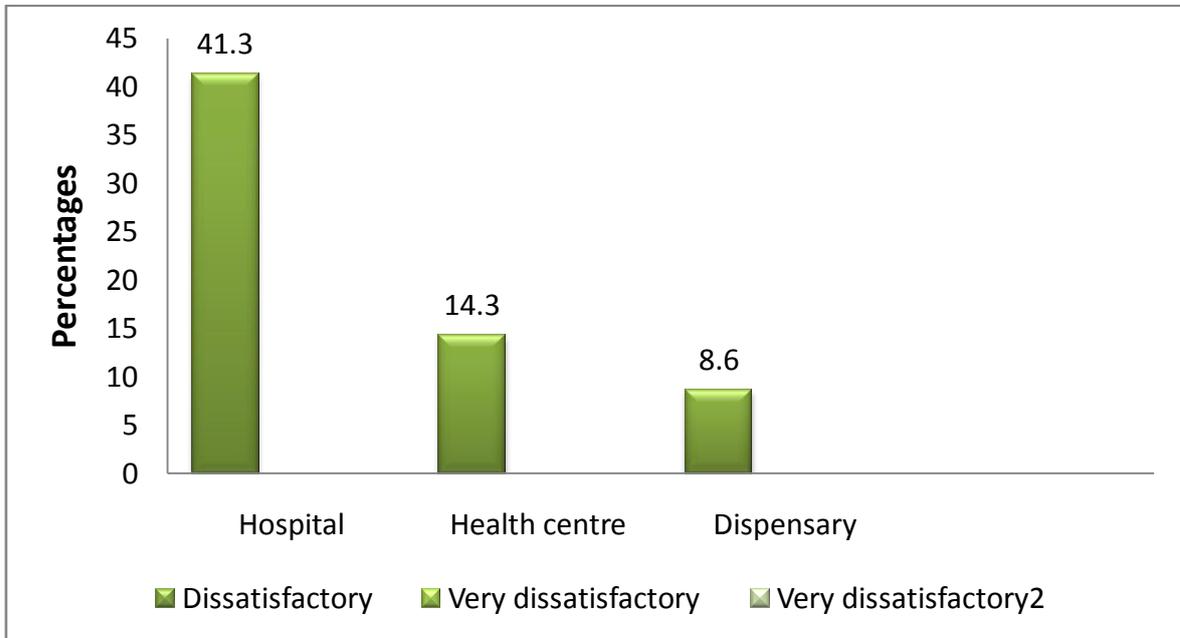


Figure 4.2.2.2: Average scores for storage conditions at the labour wards of the surveyed health facilities.

Pictures to illustrate storage conditions at the facility's labour ward sub-store of different health facilities.

- A. A cupboard without locks and keys where medicines and medical supplies are stored together.**



B. Cool box not containing EMOC products but vaccines.



C. Lack of proper storage area product are stored on the sink or in a metallic tray.



D. Storage space not enough, thus medicines and medical supplies are stored with books, basins and cleaning materials.



4.3. Interview Questionnaires

4.3.1. Results for the pregnant women who were asked to bring in their own items for delivery.

Table4.3.1.1. Social Demographic characteristics (n = 553)

Characteristics	Frequency (n)	Percent (%)
Age (years)		
15 – 20	54	9.8
21 – 25	228	41.2
26 – 31	151	27.3
32 – 37	98	17.7
38 +	19	3.4
Marital status		
Single	245	44.3
Married	282	51.0
Divorced	23	4.2
Education level		
Primary	399	72.2
Secondary	121	51.0
University	8	1.4
None	22	4.0
Parity level		
1	45	8.1
2 – 3	390	70.5
4 +	115	20.8
Occupation		
Employed	10	1.8
Not employed	25	4.5
House wife	281	50.8
Self employed	234	42.3

The study found that 94% (520/553) of interviewed pregnant women were asked to bring in their own items for delivery irrespective of the fact that 59.1% (327/553) were found to be aware of the exemption policy. Those who did not manage to bring the asked items they gave reasons as to have given birth at home 3.4% (19/553); no money to buy 0.9% (5/553) and expected to get all the items at the facility 0.7% (4/553). See figure 4.3.1.1 below:

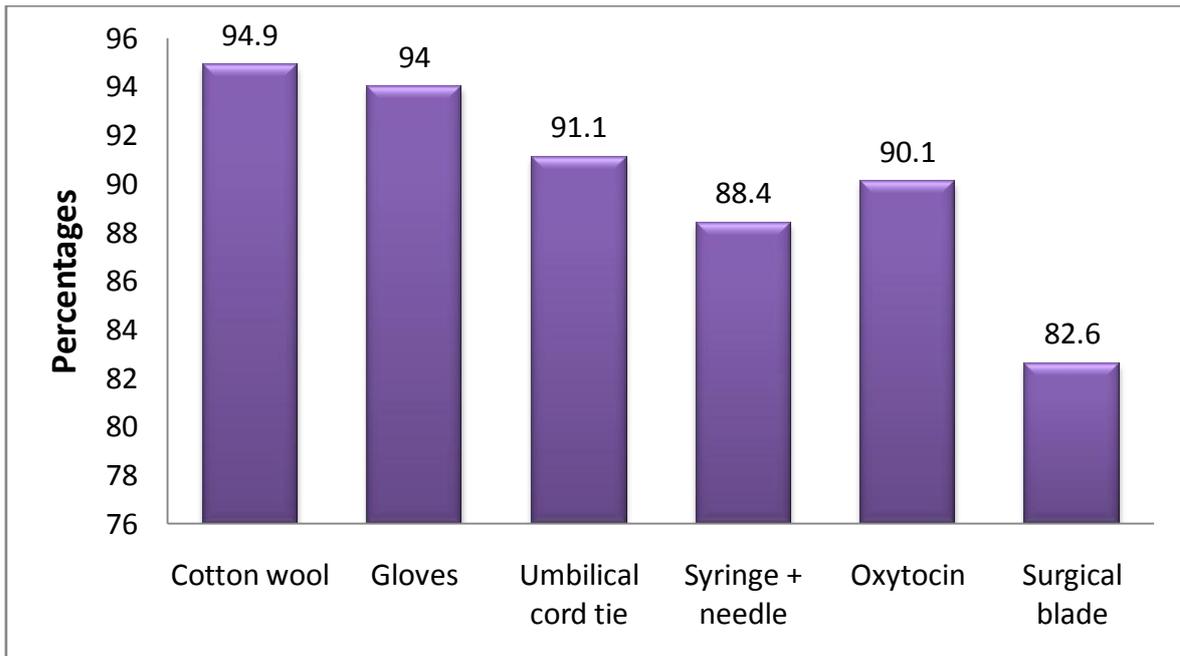


Figure 4.3.1.1: Percentage of items usually brought by pregnant women for delivery.

Table4.3.1.2: Distribution of respondent's response on other factors contributing to their ability to get the asked items for delivery

Variables	Frequency (n)	Percent (%)
ANC attendance		
Once	17	3.1
2 – 3	334	60.4
4 +	195	35.3
Items brought for delivery	526	95.1
Returned items after delivery	263	47.6
Cotton wool	253	45.8
Gloves	11	2
Delivery kit costs (Tsh)		
5000 – 10,000	77	13.9
11,000 – 15,000	239	43.2
16,000 – 21,000	171	30.9
22,000 – 27,000	29	5.2
28,000 +	6	1.1
Source of the items		
Pharmacy	349	63.1
Shop	100	18.1
Facility	71	12.2
Traditional birth attendant	4	0.7
Awareness on the policy	327	59.1
Payments at the facility	334	60.4

4.4. Knowledge of Healthcare Professionals on the Stock Management of Emoc Products.

The respondents included for this purpose were pharmacists, clinical officers and nursing officers or assistant nursing officers for the surveyed public health facilities.

Table 4.4.1: Socio Demographic Characteristics of the respondents

Characteristics	Number	Percent (%)
Professional Qualification		
Pharmacist	8	38.1
Clinical officer	7	33.3
Nursing officer	6	28.6
Age (years)		
20 – 25	1	4.8
26 – 32	7	33.3
33 – 39	7	33.3
40 +	6	28.6
Sex		
Male	9	42.9
Female	12	57.1
Experience at the store (years)		
Less than 1	3	14.3
1 – 5	12	57.1
6 – 10	1	4.8
11 – 15	3	14.3
15 +	2	9.5
Training attendance	11	52.4

Among 21 drug store managers, (8) were pharmacists, (7) clinical officers and (6) were nursing officers; the majority were females (57.1 %), aged between 26 – 32 and 33 – 39 with work experience at handling medicines of 1 – 5 years (57.1 %) and 11 (52.4 %) of them had at least attended a training on stock management once.

Quantification Methods.

Among all the 21 interviewed drug store managers 7 of them had no general concept of the quantification process of medicines and medical supplies. However it was found that 6 used the consumption methods, 8 used the ILS methods, 3 used the morbidity methods and 4 used the buffer stock as a mean of drug quantification methods at their facilities.

However a chi square test showed a significant difference between knowledge on quantification and qualification levels of the drug store professionals. (**Chi square = 15.151, df = 6, P-value= 0.02**).

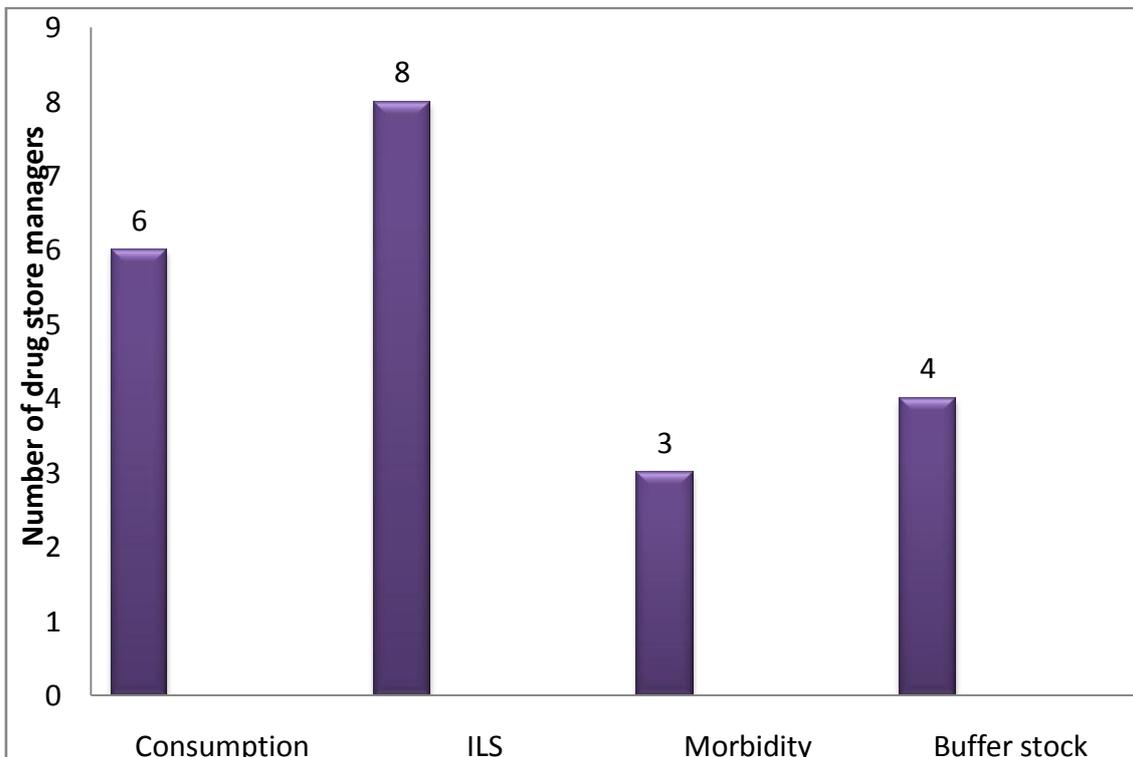


Figure 4.4.1: Quantification methods used by drug store managers in the surveyed health facilities

Inventory management

From the survey we also found that only 3 drug store managers were using BIN cards systems, while 10 were using stock ledger books as a mean of inventory control system. Mwananyamala Hospital and Magomeni Health centre were found to use both BIN cards and stock ledger books. None of the 21 respondents were using the electronic record system as the accurate means of inventory control system in spite of the fact that some had computers present in the store. **P-value= 0.07**

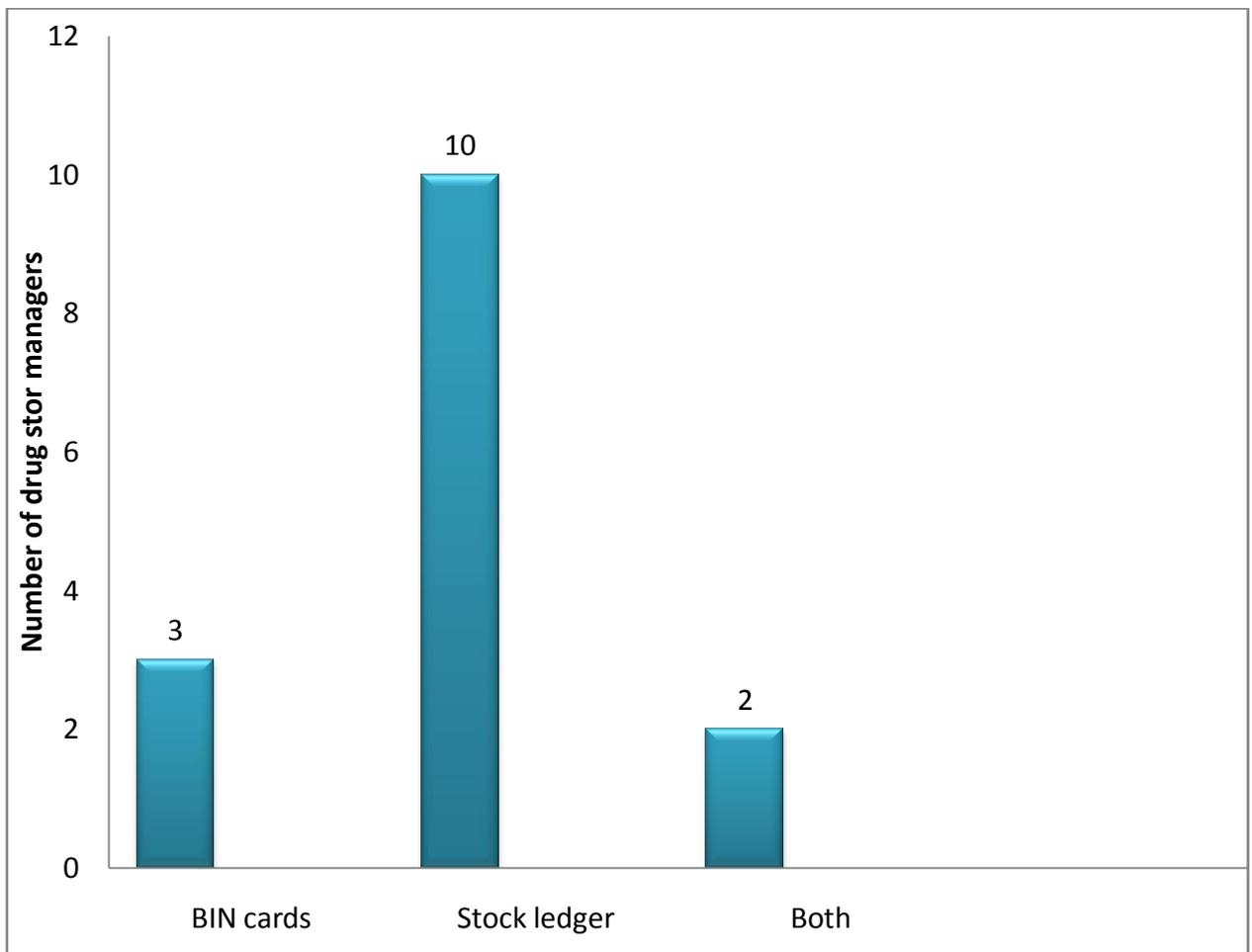


Figure 4.4.2: Stock record keeping system used by drug store managers at the health facilities.

The results revealed that among all the interviewed drug store managers only one (1) was doing physical inventory at the store every day while 8 were doing physical inventory once per week and 12 were found to be doing physical inventory after 2-3 weeks.

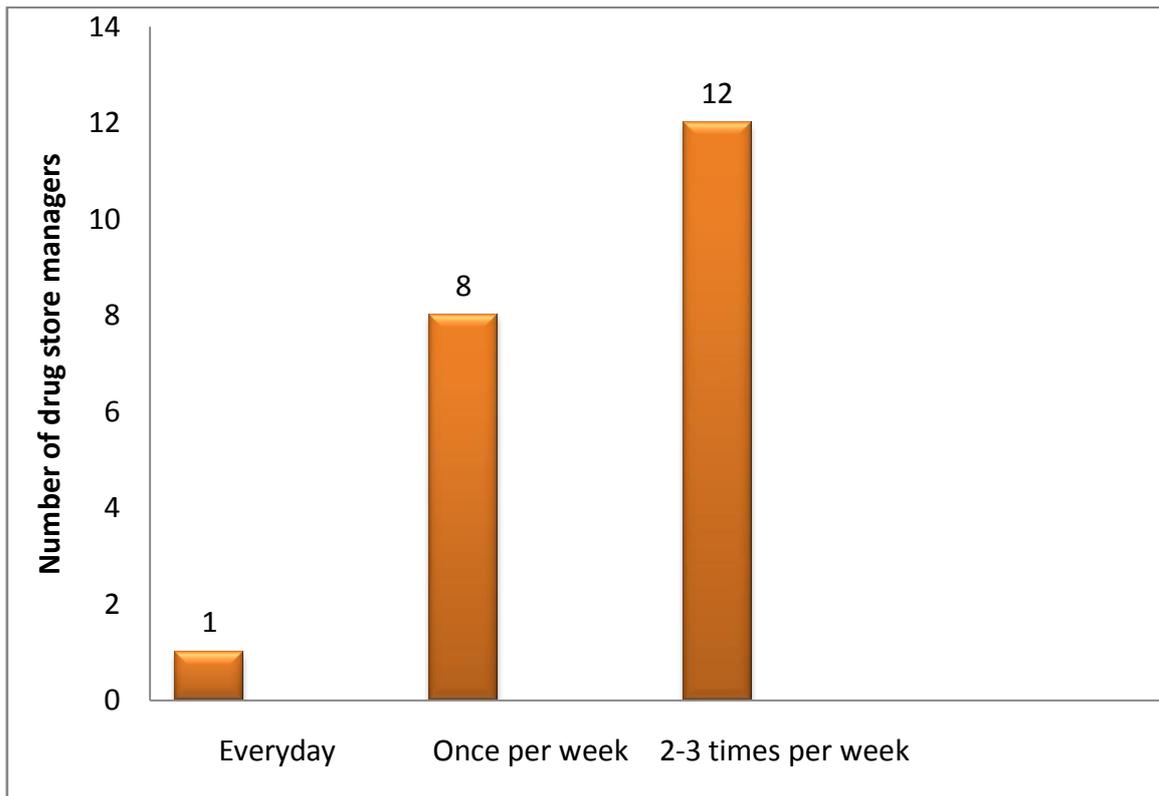


Figure 4.4.3: Number of times physical inventory was done by the drug store managers.

The application of stock flow approach was not very applied to all the respondents as we found that only 6 of them used FEFO/FIFO systems of stock flow approach out 15 remaining respondents only 4 used alphabetical stock flow approach. **P-value=0.165.**

Furthermore of all the 21 respondents, 10 did not give the correct answer regarding means of monitoring the products in stock by increasing the space in the store but 10 knew that by increasing the minimum stock level one will be monitoring stock out times which will take into consideration the variations in lead time as well.

4.4.1. Other factors reported by drug store managers affecting the stock management of EmOC products in surveyed facilities.

The results revealed that the decision on buying from private supplier varies by different facilities levels : in district hospitals it was seen that it is the supplying officer who decides on outsourcing while at the health centre level the decision came from the medical officer in charge of the facility and the pharmacist and finally at the lowest level the decision came from either the clinical officer, medical officer in charge of the facility where as some dispensaries showed that it was the facility board of committee who had the ultimate decision on outsourcing issues.

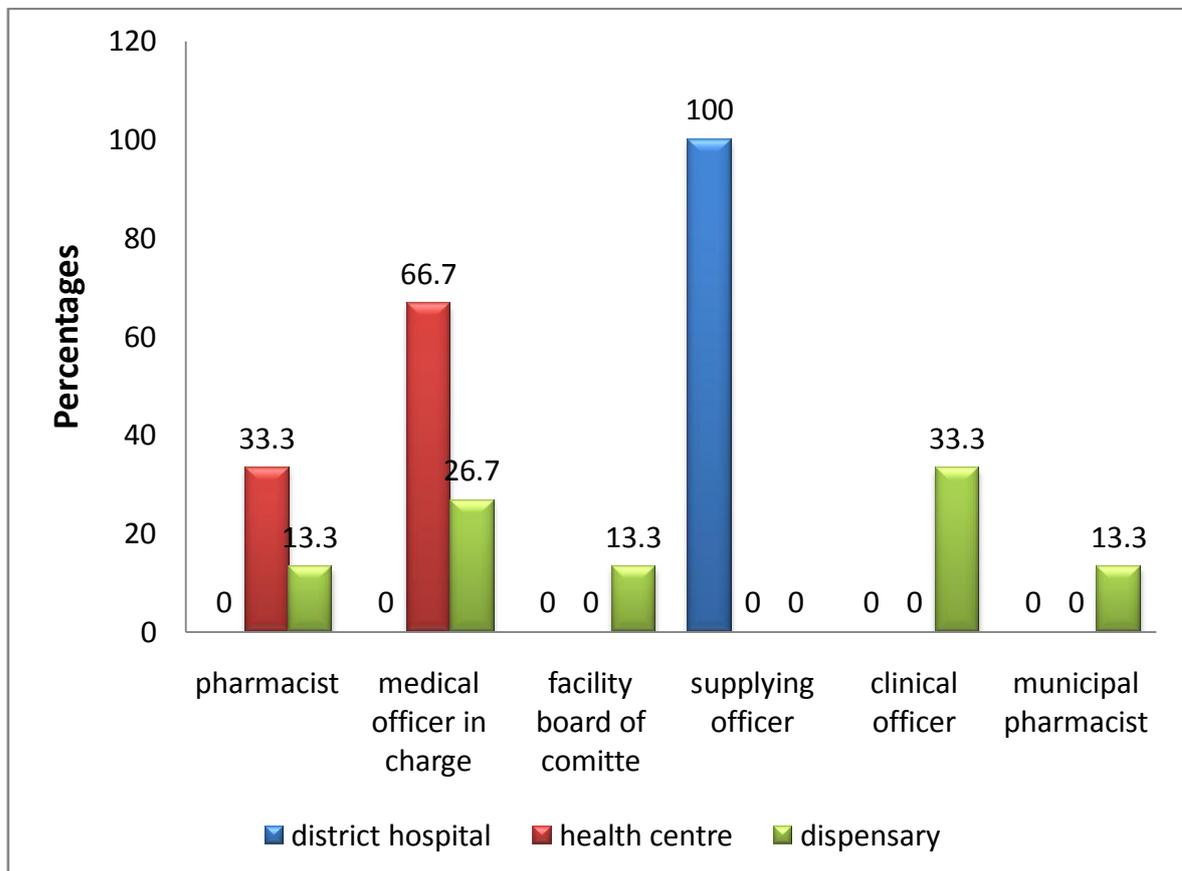


Figure 4.4.4: Decision makers on quantities to order with regards to surveyed health facility.

The results showed that the reasons that lead to buy EmOC products from private supplier at the surveyed health facility levels was mainly the stock out of the products at the MSD ,

Missing items , delays in delivering the products as well as a sudden need of the product at the facility.

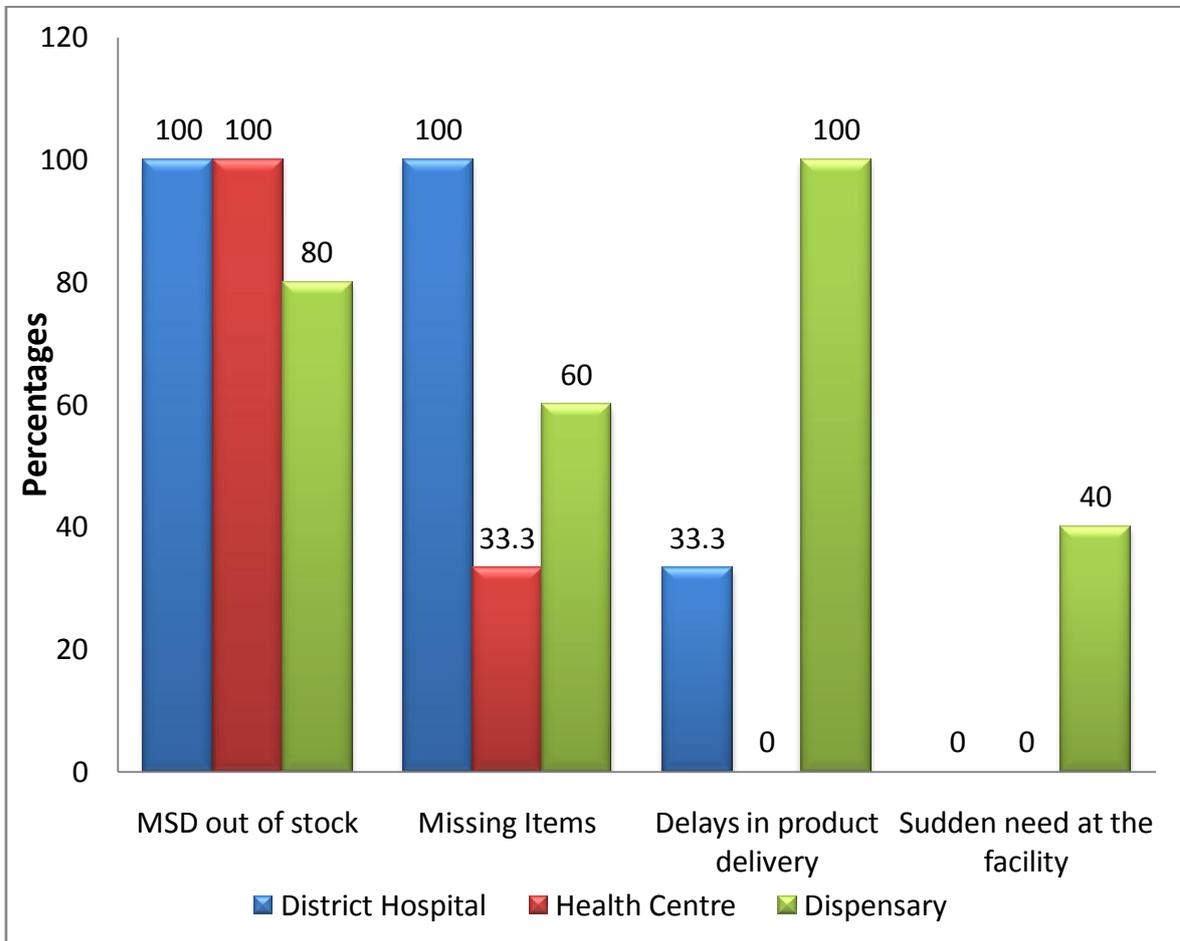


Figure 4.4.5: Reasons for procuring from private supplier.

It can be seen that different procedures were applied at the surveyed facilities for outsourcing of medicines and medical supplies , at the hospital level they inform the municipal pharmacist , write a memo to the DMO asking for petty cash and the supplying officer will look for the vendor through quotations ; at the health centre level the same procedures that are applied at the hospital level was also applied there only they also filled the MSD stock outs forms and send it to MSD so that MSD could re-supply the items in the next order. At the Dispensary level they mainly use cost sharing money to purchase the needed items at the facility apart from writing a memo to the municipal asking for petty cash, they also either inform the municipal pharmacist (but we observed that this practice is not very common as they said the process takes very long time from the municipal to

release money), finally they borrow from the nearby facility. (Eg: this practice is very common between the lower health facilities in TEMEKE DISTRICT).

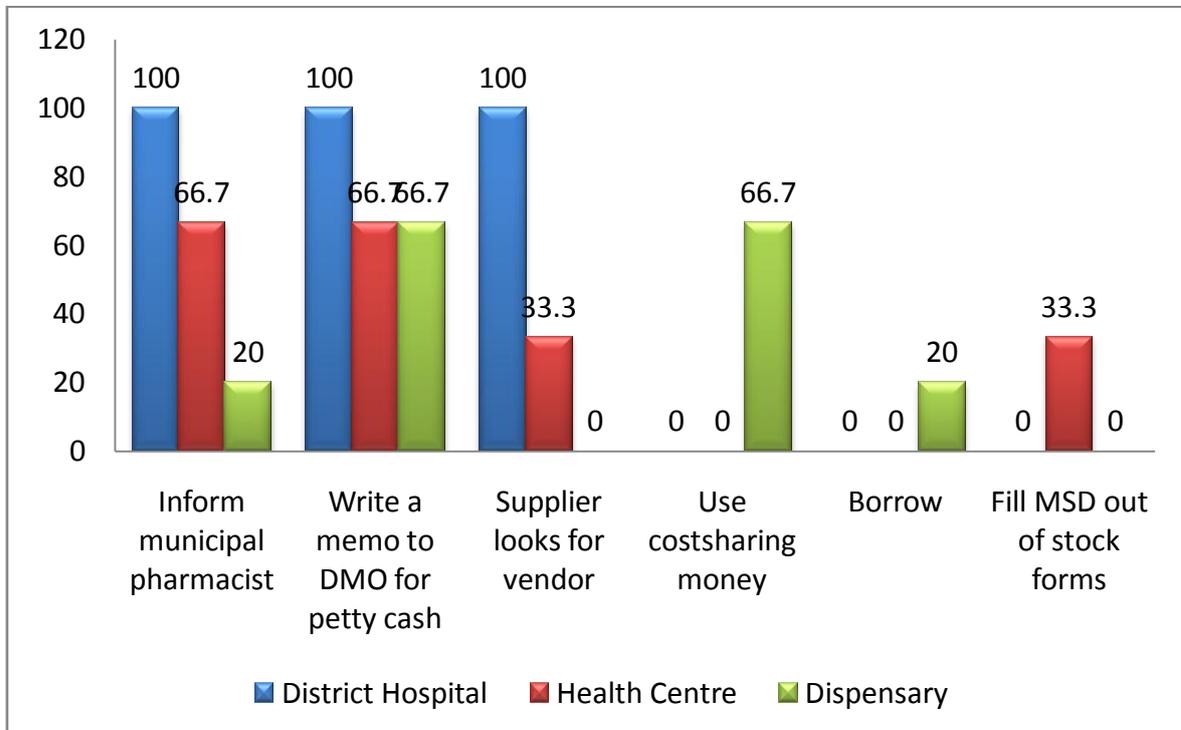


Figure 4.4.6: Procedures taken by drug store managers when buying from private supplier.

Most district hospitals send orders to MSD every 2 weeks or at the end of month, while the lower levels of the health facilities (Health Centres and Dispensaries), they send orders to MSD through the DMO's office mostly between 2 – 4 months.

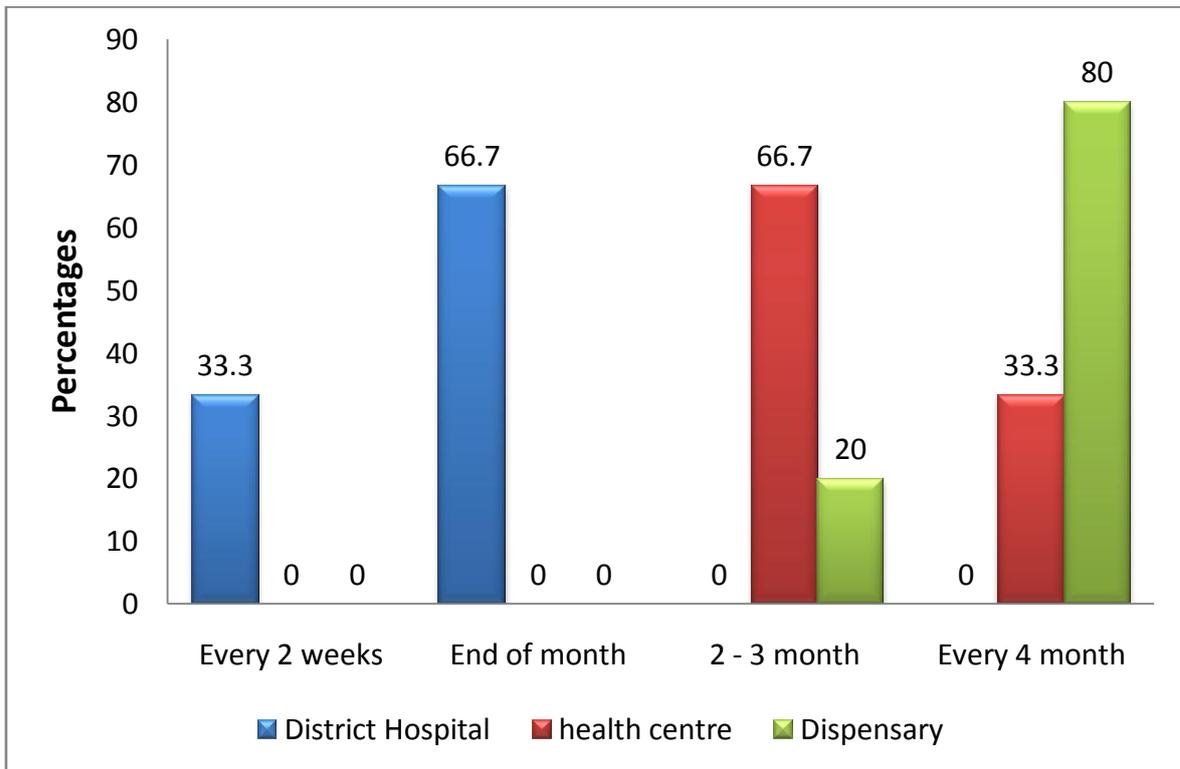


Figure 4.4.7: Routine order sent to MSD for the past twelve months

The District Hospitals sends up to more than 10 emergency orders to MSD for Emergency Obstetric Care products whilst at the Health Centre they send between 4 and 10 Emergency orders and the Dispensaries only sent 2 – 4 emergency orders either to private suppliers or to the municipal pharmacist, for the past 12 months.

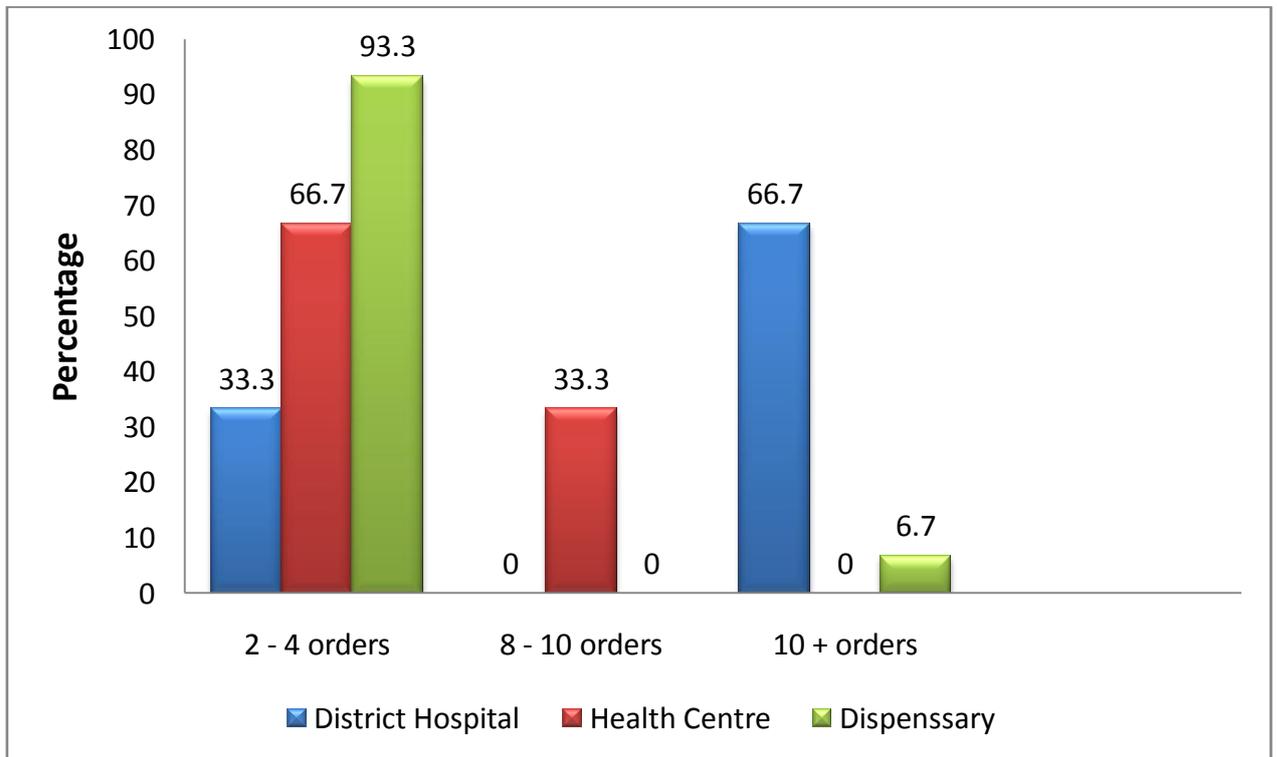


Figure 4.4.8: Emergency orders across public health facilities

CHAPTER FIVE

DISCUSSION

The study aimed at assessing the availability of EmOC products at the selected public health facilities; comparing the consumption of EmOC products in the labour wards with regards to the stock levels; assessing the knowledge of drug store managers i.e. pharmacists, clinical officers and nursing officers or assistant nursing officers; and interviewing the pregnant women on the items that they are asked to bring for delivery at the labour wards.

Availability of medicines and medical supplies in public health facilities

The availability of medicines and medical supplies at public health facilities is influenced by either budget allocation of that facility or the availability of the products at the Medical Store Department (MSD) or the way the facility adheres to the rational use of medicines(9), when facilities run out of its allocated budget, it will register low stock levels as it cannot order replenishment supplies from the stores. On the other hand when MSD is out of stock we observed that the situation affected all the facilities that ordered from MSD.

Emergency Obstetric drugs assessed included parenteral antibiotics for the treatment of sepsis, uterotonics for the treatment of Postpartum hemorrhage and anticonvulsants for the prevention and treatment of eclampsia (pregnancy induced hypertension) as well as anti-anemic for the treatment of Anemia during pregnancy (all these are complications that occur during pregnancy), local anesthetics and infusion solutions were also included in the list. In general all the hospitals surveyed were better equipped than the health centres and the dispensaries; where only 1 or 2 drugs in each category assessed were available: Ergometrin was found to be in use for the management of postpartum hemorrhage by 4.8 %, in only one Hospital. This very low availability of Ergometrin can be explained by the fact that this product has been taken out of the Tanzania MOHSW Standard Treatment Guidelines as well as in the Emergency Obstetric care Job AID 2008, which is a document

used by the RCH department in the management of different cases regarding emergencies due to pregnancy complications. In the chart which explains how to manage PPH this product is not to be used.

In general the availability of medicines was very low in all public health facilities, and this finding is similar with the study done by Suzanne et al, (34) where they reported that only 18 % of Oxytocin was available in the health facilities and that the unavailability of parenteral anticonvulsants at health facilities was one of the reasons that EmOC was below the international recommendations. Another study done in Uganda by Tumuine et al, 2010 (35) found that the unavailability of parental anticonvulsants raises concerns about the management of eclampsia.

Different views or perceptions were brought up by patients during our survey regarding the poor availability of medicines, “ there are no medicines at this facility , last week we brought a pregnant mother who had started bleeding , we had to wait for two hours to be attended by the doctor only to be told to go to MJIMWEMA DISPENSARY, because they did not have the necessary medicines to manage the patient”; and another patient reported that: “ I had to buy Oxytocin and other hypertensive medicines at the pharmacy outside the facility because the only medicine they give you here is PANADOL”.

These patients perceptions can be explained or compared to the study which was done in Bangladesh by Iqbal et al, 2009 (20) where they found that the overall supply of medicines was inadequate across all facilities and patients invariably had to buy medicines when they use public sector maternal health services, particularly for obstetric surgeries.

Furthermore the Inventory Management Assessment Tool of MSH, WHO recommends that the percentage of products to be available at the health facility should be 100% and the average percentage of time that products are out of stock, should be zero (0%). In this study the results by this tool revealed that EmOC products had been in stock over the past three months by 41.3% in the public Hospitals, by 28% in the Health centres. It should be noted that the IMAT was not used at the dispensary levels due to the poor record keeping system that was found there. The average percentage of time that products were out of stock was 41.7% in the Hospitals and 53.7% in the Health centres this was due to the long delays in receiving products after ordering (1 to 2 months at hospital and health centre

levels and 3 to 5 months for the dispensary levels), MSD always being out of the stock for the needed product, and disparities in received products. It should be noted that drugs and supplies are crucial for a facility to provide maternal care. These findings are similar to what was reported in The national medicine supply assessment that although medicines seemed to be available in health facilities, their stock management was very poor, with frequent and long lasting stock outs, Suzanne et al, (36) also reported in their study findings that staff reported long delays in receiving supplies, missing items as well as frequent stock outs. This is similar to what was reported by the Tanzania Drug Tracking Study, (37) that the long lead time periods are the key problems in creating stock outs and make it impossible to react in a timely manner to the fluctuating demands.

Moreover our findings are also similar to the study done in Malawi by Norman et al, 2007 (38) where it was reported that the main reason for the shortages of drugs at facility was insufficient deliveries from the regional Medicine Store, time taken from ordering to receiving of drugs ranged between 8 to 105 days. In an article published in the Pan African Medical Journal, by Moses et al, 2010 (39) found that stock outs were a common occurrence in Ugandan Public Health Facilities.

Lack of adequate training in medicine quantification was cited as one of the reasons affecting availability of medicines. This was probably due to the fact that staff members were not able to predict how much medicines were needed which might have led to drug shortages, similarly to what was found in a study done in Uganda by Yona et al, 2010 (35).

It should be taken into consideration that the assessment on availability was taken at a particular point in time; the stock levels are not static i.e. it is most likely that facilities might face different stock outs (smaller or larger) if visited at another point in time.

Consumption of EmOC products in the labour wards.

It has been written that quantification is “inherently imprecise due to the many variables involved” and that “useful results depends as much on art as science”. Managing Drug Supply, 1997.

The consumption of EmOC products for the period of the past three (3) months at the labour wards was found to be higher at Temeke Hospital than at Mwananyamala and Amana Hospitals.

Upon observation of what was really happening at the facilities we found that there was no reconciliation between quantities of products ordered (from the main store) and those received (in the labour wards), it was found that more products were ordered from the main store but most of the time half was issued to the labour wards for example: 800 Oxytocin was required but only 400 Oxytocin was issued to the labour wards.(the drug store manager was rationing products).This is similar to the findings of Nakyanzi et al, 2010 (40), whereby they suggested that medicine selection and quantifications should be matched with consumer tastes and prescribing habits so as to avoid extravagant and irrational consumptions. On the other hand the quantity of received products was totally different from the quantity that was actually consumed by the patients in the labour wards.

In general it was observed that there was a low consumption of the EmOC products in the labour wards, this could be explained by the fact that there was a poor record keeping at the labour wards and the products that were brought by pregnant women for delivery were not recorded anywhere. Ziraba et al, 2009 (25), in their study found that the obstetric records being largely incomplete at all the facilities that they surveyed could lead to insufficient data to conclude on the consumption levels.

It should be put into consideration that the number of deliveries per day at each facility differ from one facility to another, for example at TEMEKE Hospital they have 70 deliveries per day, (approximately 2100 deliveries per three months) while 30 to 45 deliveries per day (almost 1140 deliveries per three months) at MWANANYAMALA and 35 deliveries per day (1050 deliveries per three months) at AMANA Hospital.

Storage Conditions and Stock Management

All districts had storage facilities at all levels of the health facilities, from Hospitals, Health centres to the Dispensaries. However most of the stores were inadequate in terms of space and storage conditions. Some products when received were not stored according to the

FIFO and FEFO principles, not protected from humidity and water, the store room was not clean, the shelves were not well arranged, products were scattered on the floor and fire equipment was not available in the store room. These findings are similar to those of Muyingo et al, 2000 (41). Most facilities had inadequate inventory control and management, as seen by the fact that stock cards were there but not kept up-to-date.

The system of storage and stock management at health facilities was found to be very poor. This situation makes medicines and medical supplies to be at risk of losing their potency and efficacy. These findings are similar to what was found in the: In – depth assessment of Medicine Supply System in Tanzania, MOHSW 2008 (12). Most products mainly at the dispensary levels for example 23.8 % of the products were directly stored on the floor when there was no electricity at the facility, 42.9 % of products were stored in metallic trays and 95.2 % were stored in cool box that were using gas as a source of power whereas only 4.8 % of products were stored in the refrigerators.

Pregnant Women and Items brought in for delivery.

The majority of pregnant women were able and capable to bring the items for delivery 520 (94 %). Although most of them complained of the high costs of the delivery kits and thus inciting them to deliver at home instead of going to the health facility.

The delivery kit is mainly composed of cotton wool, umbilical cord tie, syringes and needles, surgical blade, gloves, two vials of oxytocin and sometimes ergometrin, all these items should be available at the health facilities, including other medicines and medical supplies for pregnancy related complications. The government of Tanzania has a policy that pregnant women should be exempted from any payment when seeking maternal services, unfortunately this policy is not being followed or implemented by the health facility management because pregnant women continue to pay for all the services that they receive at the health facility. Fabienne et al, 2008 (42) explained that although facility based exemptions for poor patients sometimes exist to protect the poor, they are not necessarily implemented. It was also reported in the National Road Map Strategic Plan – 2008 – 2015 (43) that the services for maternal , newborn and child health are exempted

from cost sharing but this exemption policy faces difficulties in its implementation at lower level due to lack of clarity on how to effect the exemption mechanism.

The study also found that the majority of pregnant women attending ANC on the day of our visit or who delivered 334 (60.4%) reported paying for delivery and were being asked to pay the attendants in order to be attended. This is similar to what was reported by Margaret, 2008 (44) that Despite the Tanzanian government commitment to universal provision of free Maternal Health Services pregnant mothers are still facing challenges regarding payments of delivery services at health facilities.

The interview of the pregnant women generated different observations on the quality of the services that they receive at the facilities. They reported that: Hygiene and sanitation at the facilities mainly at the lower levels of the health facilities were very poor as these could hinder the maintenance of standard infection prevention measures and make the pregnant woman susceptible to gain infections at the facility. There was a continuous and unreliable supply of electricity which led the pregnant women to give birth with the light of the mobile phone or sometimes they had to use a candle. These views were similar with the findings of Zaitoon, 2011 (45), that the availability of continuous electricity and running water is a crucial prerequisite for quality MNH service delivery. Other views included bribery issues at the health facilities whereby patients could not be attended unless they gave money to the attendant.

Knowledge of staff on Stock Management

Lead time is an important indicator in ensuring stock availability, operating with short a time from ordering until delivery is essential for ensuring stock availability. Tanzania drug tracking study 2007 (37). The study found that pharmacists showed to be very good at the concept of lead time while the clinical officers and the nurses were good and the assistant nurses being poor at this concept.

Quantification of commodities means estimating how much a specific item is needed and what financial means are required to obtain it. Managing Sciences for Health, Rational Pharmaceutical Management Plus, 2006 (46). When assessed on methods of quantifications mostly pharmacists were found to be familiar with the consumption

methods while the clinical officers and the nursing officers were familiar with the Integrated Logistics Systems of medicine quantifications this could possibly be due to the fact that the government has rolled out the old in-depth system and has put into place the use of ILS in the lower levels of the public health facilities; and the morbidity methods. The 4 who did not know what methods they are supposed to use are the ones who said they are using buffer stock and so were scored as to have a poor knowledge on the quantification methods to determine order quantities for their respective facilities.

Most pharmacists used BIN cards, stock ledger books or both methods of record keeping systems at the hospitals and health centres levels of health facilities, while the clinical officers and the nurses only used stock ledger books as a means of assuring inventories at their respective facility drug stores i.e.: at dispensary levels. We also found a significant variation with P-value < 0.05 in the application of record keeping systems with the qualification of the drug store supervisor or manager.

First in First out FIFO and First expired First out FEFO are among the known approaches, of these two approaches FEFO is the most recommended one as it minimizes the problem of drug expiry. Regarding the application of stock flow approaches by drug store managers upon supplying EmOC products to the labour wards 6 (28.6%) of drug store managers were using FEFO approach, this figure is higher than 5.8% that was reported by Nakyanzi et al, 2009 (40). Therefore these drug store managers should be advised on the application the FEFO stock flow approach and its advantages in the drug stores.

CONCLUSION

Adequate supplies are essential in the provision of quality emergency obstetric care. The availability of EmOC products in all the 21 surveyed public health facilities was found to be low regardless of the health facility level (hospital, health centre or dispensary) and the average time that products were out of stock was high too. Specific areas that require attention include ensuring that basic supplies are available in order to handle obstetric complications in public health facilities.

However the consumption of EmOC products in the labour wards was found to be lower than the real actual consumption, this could be explained by the fact that the products brought by pregnant women for delivery was not recorded in any of the records found at the labour ward, i.e.: the examined records were largely incomplete and therefore made it difficult to yield proper data.

Medicines and medical supplies are very expensive, and they have a direct impact on the life of an individual they should therefore be stored under the correct combinations of cleanliness, protected from direct sunlight, protected from humidity and water, and in a cold environment for those products that needs to be kept in such conditions. The storage conditions in some of the surveyed facilities was found to be poor not to mention the scenarios observed at the dispensary labour wards. There is need to improve the availability of EmOC products and the storage conditions at health facilities.

In the process of reaching the millennium development goal number five Tanzania aims to have reduced maternal mortality rate by three quarters by the year 2015. But as long as pregnant women are asked to bring in their products for delivery irrespective of the fact that the national policy exempts them from payments for maternal and neonatal services in public health facilities, i.e.: pregnant women not having access to good quality, affordable medicines and medical supplies, this will have a negative impact on the MDG 5.

The knowledge of the drug store managers on the stock management of EmOC products were found to be poor and this was supported by the frequent stock outs of EmOC products at all levels of the health facilities, poor inventory management systems and the poor storage conditions in which Oxytocin was found to be stored at the majority of the health facilities surveyed.

RECOMMENDATIONS

1. Educational approach

The health facility management should conduct short trainings on stock management of EmOC products for the drug store managers. They should also ensure that proper and comprehensive inventory systems are instituted within the health facilities in order to ensure that medicines and medical supplies are distributed according to need.

The head of department should train their staff on how to do a physical inventory in order to avoid disparities and manage proper quantification of goods.

2. Managerial approach

The health facility management teams should ensure availability of EmOC products at all levels of the public health facilities by:

Maintaining accurate and up to date stock cards by checking that the recorded balances on the stock cards reflects the physical stock.

Use Average Monthly Consumption as a basic for estimating reorder quantities, this in order to adjust for the seasonal variations and to minimize the effect of stock outs.

Set Max-Min stock levels in order to prevent stock outs and frequent orders of small quantities.

Enforce standardized logistics procedures for the management of medicines and medical supplies.

The record keeping system should be updated and reviewed on a quarterly basis, and follow ups or supervision visits needs to be done on how medicines are being managed in the labour wards.

Storage conditions were critical, e.g.: insufficient space. Therefore the storage area at the surveyed facilities needs to be expanded in order to have sufficient space.

Cold storage with temperature chart should be provided in order to avoid keeping medicines such as Oxytocin on the floor or metallic tray. This will help monitor temperature levels for the products in stock.

3. Regulatory approach

The regional and district medical officers should review reports and follow up on problems during supervision visits.

The MOHSW and other stake holders should ensure reinforcement and the implementation of the existing policy on the exemption payments for the maternal and childbirths in all the public health facilities.

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APENDICES

APPENDIX 1: QUESTIONNAIRES (English version)

TO THE IN CHARGE OF THE MAIN STORE

INTERVIEW QUESTIONNAIRES TO ASSESS THE STOCK MANAGEMENT OF EmOC PRODUCTS IN PUBLIC HEALTH FACILITIES IN DAR ES SALAAM REGION.

FACILITY IDENTIFICATION

- 01. Facility number.....
- 02. Date.....
- 03. Facility name.....
- 04. Facility type : - National referral hospital
 - District hospital
 - Health centre
 - Dispensary
- 05. Facility location.....

SOCIAL DEMOGRAPHIC CHARACTERISTICS

- 1. In-charge / supervisor of the sub-store of medicines in the wards
 - a. Pharmacist
 - b. Pharmaceutical Technician
 - c. Clinical Officer
 - d. Nursing Officer/ Nurse Midwife
 - e. Nurse Assistant

- 2. Sex
 - a. Male
 - b. Female

3. Age in years
 - a. 18- 25
 - b. 26- 32
 - c. 33- 39
 - d. Above 39

4. Experience at work of the sub-store supervisor(years)
 - a. Less than 1
 - b. 1 to 5
 - c. 6 to 10
 - d. 11 to 15
 - e. More than 15

5. Have you ever attended any training on stock management
 - a. Yes
 - b. No

6. How many times have you attended such a course within the last two years?
.....

7. What can you say about the course?.....
.....

8. What person in the facility decides on pharmaceuticals to order or to purchase?
.....

9. What methods do you use to determine order quantities?.....

10. What records or reports do you use when deciding how much to order?
.....

11. When MSD is out of stock who has the ultimate decision on quantity to order and external source of order? i.e.: who needs to approve any outgoing order?

.....

12. When you miss a drug /product from MSD, what procedures do you undergo to order from external supplier or source?

.....

13. How often do you place orders for your medicines? (do not count the emergency or exceptional order).....

14. You place your order based on what kind of information when you procure from external source other than MSD?

.....

15. How many orders (routine and emergency) did you send to the MSD last 12 months? Is it possible for me to see your ordering documents?

.....

16. What are the major problems you come across when ordering from MSD?.....

17. What are the situations that makes you place an Emergency Order or buy from a private supplier?.....

18. What time does it take for you to receive your products after sending the order? (Estimate time in days, weeks or months).....

19. When the nurse comes to take the next order, how do you know that the previous order is completely used?

.....

20. Do you do any follow up on the medicines you issued to the maternity ward?

.....

21. If yes where do you record the number or quantity of medicines that are used in the maternity ward?

.....

22. How do you issue medicines to the wards; which documents do you use and what is the frequency of issue? (Estimate in number of hours, days or weeks or months).....

23. What happens when you order from MSD and get less or you don't get at all? What do you do?

24. Please explain what you do when faced with stock outs of at least one of the emergency obstetric care medicines? (Oxytocin, Magnesium Sulphate, Misoprostol)

.....

.....

TO THE NURSE IN CHARGE OF THE MATERNITY WARD PHARMACY**FACILITY IDENTIFICATION**

01. Facility number.....
02. Date.....
03. Facility name.....
04. Facility type : - National referral hospital
 - District hospital
 - Health centre
 - Dispensary
05. Facility location.....

SOCIAL DEMOGRAPHIC CHARACTERISTICS

1. In-charge / supervisor of the sub-store of medicines in the wards
 - a. Pharmacist
 - b. Pharmaceutical Technician
 - c. Clinical Officer
 - d. Nursing Officer/ Nurse Midwife
 - e. Nurse Assistant
2. Sex
 - a. Male
 - b. Female
3. Age in years
 - a. 18- 25
 - b. 26- 32
 - c. 33- 39
 - d. Above 39

- 4. Experience at work of the sub-store supervisor(years)
 - a. Less than 1
 - b. 1 to 5
 - c. 6 to 10
 - d. 11 to 15
 - e. More than 15

- 5. Have you ever attended any training on stock management
 - a. Yes
 - b. No

- 6. How many times have you attended such a course within the last two years?
.....

- 7. What can you say about the
course?.....

- 8. What records do you use to order medicines from the main store? Can I please have
a look at the records?
.....

- 9. On what basis do you place order from the main store? (daily, weekly,
monthly).....

- 10. What happens when you order from the main store and get less or you don't get at
all?
.....

- 11. If the medicines that you received from the main store for that day are not used
what do you do with them?
.....

12. Has it happened that pregnant women deliver without the medicine being available?.....
.....

13. Do you always have medicine available in your store or patients are sometimes required to bring or to buy from outside?.....

14. What about other emergency obstetric care products, do you always have them?

15. Please explain what you do when you are faced with stock outs of at least one of the Emergency Obstetric Care medicines? (Oxytocin, Misoprostol, Magnesium Sulphate).....

16. How often do you do your stock taking or physical inventory?

17. Which types of medicines do you store in the maternity wards?

18. Where do you store them? Can I please visit your storage area?

19. Where do you store your oxytocin injections or ergometrin?

20. How is the supply system at your maternity wards? (movement of medicines from the maternity ward store to the patient) What records do you use to issue medicines to the patient?
.....
.....
.....

21. You ordered from the main store 20 Oxytocin, and 10 are being used. How do you tell the pharmacist that 10 vials of Oxytocin have been used? Where do you record the amount of medicines that are used?

.....

.....

.....

.....

TO THE PREGNANT WOMEN

FACILITY IDENTIFICATION

- 01. Facility number.....
- 02. Date.....
- 03. Facility name.....
- 04. Facility type : - National referral hospital
 - District hospital
 - Health centre
 - Dispensary
- 05. Facility location

SOCIAL DEMOGRAPHIC CHARACTERISTICS

- 1. Age of the respondent
 - a. 15 to 20
 - b. 21 to 25
 - c. 26 to 31
 - d. 32 to 37
 - e. 38 and above
- 2. Marital status
 - a. Single
 - b. Married
 - c. Divorced/ widowed/ separated
- 3. Level of education
 - a. Primary school level
 - b. Secondary school level
 - c. University level

- d. None of the above
- 4. Parity level(number of children given birth to)
 - a. 1
 - b. 2 to 3
 - c. 4+
- 5. Occupation of the respondent
 - a. Employed
 - b. Not employed
 - c. House wife
 - d. Self employed

QUESTIONNAIRES

- 1. How long have you been coming here for clinics?
.....
- 2. Have you ever been asked to bring any tools or medicines before delivering?
.....
- 3. List the specific supplies that you know which you have been asked to bring?
.....
- 4. Was it easy for you to buy all the items that you were asked to bring for delivery?
.....
- 5. Can you please mention the price of each item you bought?
.....

6. Where did you buy the medicines that you were told to bring?

- a. Pharmacy
- b. Addo
- c. Facility
- d. No response

7. If the items you brought were not all used, were they returned to you after delivery?

.....

8. Do you know that all the services from ANC to PNC are supposed to be exempt from any payment?

(Free).....

9. What can you say about the quality of the services that you received from this facility? (Service provided by the Doctor, Nurse, the one giving drugs, receptionist).....

.....

QUESTIONNAIRE TO ASSESS KNOWLEDGE OF THE DRUG STORE MANAGERS.

FACILITY IDENTIFICATION

1. Facility number
2. Date
3. Facility name
4. Facility type: - National referral hospital
 - District hospital
 - Health centre
 - Dispensary.
5. Facility location

SOCIAL DEMOGRAPHIC CHARACTERISTICS

1. In-charge/supervisor of the drug store
 - a. Pharmacist
 - b. Pharmaceutical technician
 - c. Clinical officer
 - d. Nursing officer/nurse midwife
 - e. Nurse assistant
2. Sex
 - a. Male
 - b. Female
3. Age in years
 - a. 18-25
 - b. 26-32
 - c. 33-39
 - d. Above 39

4. Experience at work of the drug store supervisor (years)
 - a. Less than 1
 - b. 1-5
 - c. 6-10
 - d. 11-15
 - e. More than 15

QUESTIONNAIRES

1. What quantification methods do you use at this facility
2. What do you think are the importance of having an effective quantification method at the facility?
3. Who decides on quantities of medicines and medical supplies to order?
4. Which method or products organization do you use upon reception of your products
5. What record keeping system do you use?
6. How do you store your oxytocin, may I please see the storage area for oxytocin?
7. How often do you do your physical inventory?
8. What do you think is the best way to monitor the products in stock?
9. How can you monitor stock out time?
10. How many times do you place an emergency order for your emergency obstetric products?

APPENDIX 2: QUESTIONNAIRES (SWAHILI VERSION)**KWA MFAMASIA HUSIKA WA BOHARI YA DAWA**

MAHOJIANO YA MASWALI KUANGALIA UPATIKANAJI WA USIMAMIZI WA MADAWA NA VIFAA TIBA KATIKA VITUO VYA UMMA VYA KUTOLEA HUDUMA ZA DHARURA ZA UZAZI, MKOANI DAR ES SALAAM.

01. Namba ya kituo.....
02. Tarehe.....
03. Jina la kituo.....
04. Eneo la kituo.....
05. Aina ya kituo: - Hospitali ya rufaa
 - Hospitali ya Mkoa
 - Kituo cha afya
 - Zahanati

1. Mhusika wa chumba cha dawa kilichopo wadini
 - a. Mfamasia
 - b. Fundi sanifu wa dawa
 - c. Afisa tabibu
 - d. Afisa Muuguzi/ Mkunga
 - e. Muuguzi msaidizi

2. Jinsi
 - a. Mme
 - b. Mke

3. Umri (Miaka)
 - a. 18 hadi 25
 - b. 26 hadi 32
 - c. 33 hadi 39

d. Zaidi ya miaka 39

4. Uzoefu wa usimamizi wa stoo (miaka)

a. Chini ya mwaka mmoja

b. 1 hadi 5

c. 6 hadi 10

d. 11 hadi 15

e. Zaidi ya miaka 15

5. Ulisha wahi kuhudhuria mafunzo yoyote yanayo husu usimamizi wa vifaa tiba na madawa?

a. Ndio

b. Hapana

6. Mara ngapi umehudhuria mafunzo hayo kwa miaka miwili iliyo pita?

.....

7. Una maoni gani kuhusu mafunzo hayo?

.....

8. Ni mtu gani katika kituo anayefanya maamuzi ya uagizaji na ununuzi wa vifaa tiba na ma dawa?

.....

9. Una tumia njia gani kupata kiwango cha kuagiza?

.....

10. Una tumia nyenzo gani unapo amua ni kiwango gani cha kuagiza kutoka bohari ya dawa?

.....

11. Unapo kosa vifaa MSD, ni nani anafanya maamuzi ya kwenda kununua katika chanzo kingine?

.....

12. Ni mara ngapi una agiza dawa na vifaa tiba?

.....

13. Unapokosa dawa MSD, una tumia utaratibu gani ilikununua dawa na vifaa Tiba katika vyanzo vingine?

.....

14. Ni mara ngapi umetuma maombi ya dawa MSD kwa kipindi cha miezi kumi na mbili iliyo pita (Maombi ya kawaida na dharura).....

15. Ni changamoto gani unazozipata katika uagizaji wa dawa kutoka MSD?

.....

16. Ni sababu gani zinazo sababisha kufanya maombi ya dharura au kununua kutoka katika vyanzo vingine?

.....

17. Je unapata dawa/ vifaa tiba vyako kwa wakati kila unapotuma maombi MSD (kadiria muda kwa siku, wiki, au miezi)?

.....

18. Jinsi gani unatoa dawa kwenda wadini. Unatumia nyenzo gani na unatoa dawa marangapi? (kadiria masaa, siku au wiki).....

19. Unapo tuma maombi ya dawa MSD, na kupokea dawa pungufu au kukosekana kabisa je unachukua hatua gani?

.....

20. Unapo kabiliwa na tatizo la ukosefu wa dawa (angalaumoja) za huduma ya dharura yauzazi, je una chukua hatua gani? Tafadhali elezea

.....

21. Mkunga anapo kuja na oda nyingine unajuaje kwamba oda iliyo pita imetumika yote?

.....

22. Una fuatilia matumizi ya dawa uliyo toa wodi ya uzazi?

.....

23. Kama ndio una rekodi wapi idadi ya ma dawa ya dharura ya uzazi iliyo tumika wodi ya uzazi?

.....

24. Unatoa madawa ya dharura ya uzazi wadini kutumia rekodi gani?

.....

KWA AFISA MUUGUZI/ MKUNGA WA STOO YA WODI YA UZAZI.

MAHOJIANO YA MASWALI KUANGALIA UPATIKANAJI NA USIMAMIZI WA
MADAWA NA VIFAA TIBA KATIKA VITUO VYA UMMA VYA KUTOLEA
HUDUMA ZA DHARURA ZA UZAZI, MKOANI DAR ES SALAAM.

01. Namba ya kituo.....
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 - Zahanati
-
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 - a. Mfamasia
 - b. Fundi sanifu wa dawa
 - c. Afisa tabibu
 - d. Afisa Muuguzi/ Mkunga
 - e. Muuguzi msaidizi
 2. Jinsi
 - a. Mme
 - b. Mke
 3. Umri (Miaka)
 - a. 18 hadi 25
 - b. 26 hadi 32
 - c. 33 hadi 39
 - d. Zaidi ya miaka 39

4. Uzoefu wa usimamizi wastoo (miaka)
 - a. Chini ya mwaka mmoja
 - b. 1 hadi 5
 - c. 6 hadi 10
 - d. 11 hadi 15
 - e. Zaidi ya miaka 15

5. Ulishawahi kuhudhuria mafunzo yoyote yanayo husu usimamizi wa vifaa tiba na madawa?
 - a. Ndio
 - b. Hapana

6. Mara ngapi umehudhuria mafunzo hayo kwa miaka miwili iliyo pita?
.....

7. Una maoni gani kuhusu mafunzo hayo?
.....

8. Unapo kabiliwa na tatizo la ukosefu wa dawa (angalaumoja) zahuduma ya dharura ya uzazi, unafanya je? Tafadhali elezea
.....

9. Ni mara ngapi unafanya hesabu ya mali?
.....

10. Je ilishawahi kutokea kwa mama mjamzito kujifungua bila kuwepo kwa dawa?
.....

11. Unapo pokea dawa kutoka bohari kuuambazo hazikutumika kwa siku uliyoagiza. Unachukua hatua gani kuhusu dawa hizo?
.....

12. Unapoagiza dawa kutoka bohari kuu na kupata kiwango kidogo au usipate kabisa una chukua hatua gani?

.....

13. Una tunza wapi dawa ya okisitosini?

.....

14. Elezea mzunguko wa madawa na vifaa tiba katika kituo chako (unapo toa dawa bohari kuu mpaka inapo fika kwa mgonjwa)

.....

15. Una tumia rekodi gani ku odea ma dawa ku toka bohari kuu? Na weza kuona nakala yako?

.....

16. Ni aina gani za ma dawa ya dharura ya uzazi mnatunza wodi ya uzazi? Tafadhali taja

.....

17. Una tunza wapi? Na weza kuona stoo yenu?

.....

18. Dawa zina patikana mara kwa mara katika stoo yenu, au wagonjwa wakati mwingine wa nunua kutoka nnje?

.....

19. Elezea mzunguko wa madawa kutoka stoo yako mpaka kwa mgonjwa. Una tumia rekodi gani kumpa mgonjwa dawa?

.....

20. Ume odadawaya OKSITOSINI 20 kutokaboharikuu, 10 zimetumika, unatumia rekodi gani unapo kwenda kwa mfamasia kuchukua au kutoaoda nyingine?

.....

KWA MAMA MJA MZITO

01. Namba ya kituo.....
02. Tarehe.....
03. Jina la kituo.....
04. Eneo la kituo.....
05. Aina ya kituo: - Hospitali ya rufaa
-Hospitali ya Mkoa
-Kituo cha afya
-Zahanati

1. Ni mara ngapi unakuja kliniki katika kituo hiki?

.....

2. Je uliagizwa kuja na vifaa tiba au dawa yoyote kabla ya kujifungua?

.....

3. Taja au orodhesha vifaa tiba au dawa ulizo agizwa kuja nazo.....

4. Je ulirudishiwa vifaa tiba au dawa vilivyo baki baada ya kujifungua? Taja ulivyo rudishiwa.

.....

5. Ulifanikiwa kuleta au kupata vifaa tiba au dawa yote ulivyoagizwa kuleta kabla ya kujifungua?

.....

6. Kama jibu ni hapana, tafadhali fafania zaidi nini ilitokea?

.....

7. Manunuzi ya madawa na vifaa tiba uliyo ambiwa kuleta je ilikua ni rahisi kwako? i.e
:uliweza kununua dawa na vifaa tiba yote uliyo
agizwa?.....
8. Unaweza kukumbuka bei za madawa na vifaa tiba yote uliyo nunua kwa ajili ya kuja
kujifungulia? Tafadhali taja kila kifaa na bei yake kama ita
wezekana.....
9. Ulinunua wapi dawa uliyo leta? (a. famasi b. duka la dawa baridi c. kituoni
(mkunga)).....
10. Unajua kwamba hutakiwi kutozwa pesa kwa ajili ya huduma zote za uzazi? (kuanzia
unapo kuja kuanza kliniki mpaka unapo
jifungua?.....
11. Toa maoni yako kuhusu huduma uliyo pokea katika kituo hiki, kuanzia mapokezi
mpaka ulipo ondoka
kituoni.....

APPENDEX 3: LISTOFTRACER PRODUCTS

S/N	Description	Strength	Form
1.	Benzanthine penicillin	500mg	Injection
2.	Benzyl penicillin	500mg	Injection
3.	Procain penicillin forte		injection
4.	Metronidazole	600mg	Injection
5.	Chloramphenicol		Injection
6.	Erythromycin		Injection
7.	Ergometrin		injection
8.	Misoprostol		
9.	Oxytocin	10 I.U	Injection
10.	Diazepam	5mg	Injection
11.	Hydralazine	5g	Injection
12.	Magnesium sulphate		
13.	Iron + Folic acid		Tablets
14.	Hemovit	500ml	Syrup
15.	Folic acid		Tablets
16.	Ferrous sulphate		
17.	Dextrose 5 %		I.V solution
18.	Glucose 50 %		
19.	Normal saline		
20.	Ringer lactate		
21.	Water for injection(sterile water)		
22.	Lignocaine 2 %		
23.	Adrenaline		
24.	Catgut chromic		
25.	Cotton wool		
26.	Gloves		
27.	Umbilical cord tie		
28.	Surgical blade		
29.	Syringe + needle		
30.	Spirit		

APPENDIX 4: FACILITY STORAGE CONDITION OBSERVATION CHECK LIST

Date.....Facility Name.....

Facility type..... District.....

Key: Yes = 1; No = 0; N/A = 3

S/n	Description	Score	Comments
1.	Products ready to distribution/dispensing are arranged so that identification labels and expiry dates and/or manufacturing dates are visible.		
2.	Products are stored and organized in a manner that facilitate first-to-expire, first-out (FEFO), counting and general management.		
3	Cartons and products are in good condition, not crushed due to mishandling. If cartons are open, determine if products are wet or cracked due to heat/radiation (fluorescent lights in the case of condoms/gloves) and cartons are put right-side up		
4	The facility separate damaged and/or expired products from usable products and removes them from inventory.		
5	Products are protected from direct sunlight at all times of the day and during all seasons.		
6	Cartons and products are protected from water and humidity during all seasons.		
7	Storage area is visually free from harmful insects and rodents. (Check the storage area for traces of rodents [droppings or insects].)		

8	Storage area is secured with a lock and key, but is accessible during normal working hours; access is limited to authorized personnel.		
9	Products are stored at the appropriate temperature during all seasons according to product temperature specifications.		
10	Roof is always maintained in good condition to avoid sunlight and water penetration at all times.		
11	Storeroom is maintained in good condition (clean, all trash removed, shelves are sturdy, boxes are organized).		
12	The current space and organization is sufficient for existing products and reasonable expansion (i.e., receipt of expected product deliveries for foreseeable future).		
13	Products are stacked at least 10 cm (4 inches) off the floor.		
14	Products are stacked at least 30 cm (1 foot) away from the walls and other stacks.		
15	Products are stacked no more than 2.5 meters (8 feet) high.		
16	Fire safety equipment is available and accessible (any item identified as been used to promote fire safety should be considered).		
17	Products are stored separately from insecticides and chemicals.		

APPENDIX 5: LABOUR WARD STORAGE CONDITION OBSERVATION CHECK LIST

Date.....

Facility Name and type.....

District.....

Key: Yes = 1; No = 0; N/A = 3

S/N	Description	score	Comments
1.	Identification label and expiry date visible		
2.	There are windows that can be opened or air vents		
3.	Systematic storage of medicines , alphabetically, FEFO, FIFO		
4.	Products in good condition not crushed		
5.	Products protected from direct sunlight		
6.	Protected from water and humidity (no leaking ceiling, roof, taps etc).		
7.	Storage area free from insects and rodents		
8.	Area with key and lock for security		
9.	Roof maintained to avoid sunlight from penetrating		
10.	Store room clean, trash removed , shelves sturdy		
11.	Current space sufficient for the existing products		
12.	Method in place to control temperature e.g : roof and ceiling are spaced in between in hot weather)		
13.	Expired medicines are well kept in a separate place from usable ones		
14.	Medicines are not directly stored on the floor		
15.	Products stored in a metallic tray		
	Total marks (t)		
	Average score = [(t) × 100] ÷ 21		

APPENDIX 6: INVENTORY MANAGEMENT ASSESSMENT TOOL (IMAT)

INVENTORY MANAGEMENT ASSESSMENT TOOL (IMAT)					ORGANIZATION _____ —		
C. DATA COLLECTION AND CALCULATION SHEET					TODAY'S DATE _____ —		
A	B	C	D	E	F	G	H
#	Name of product	Unit	# DAYS out of stock within the last 100 days. Starting date / /	Last stock balance recorded on stock cards. Do not correct errors!	Physical quantity (based on actual count)	Difference between recorded and physical values (E-F)	Absolute value of G /G/ (remove minus signs from results in column G)
1							
2							
3							
4							
5							
6							
7							
8							

APPENDIX 7: CONSENT FORM(ENGLISH VERSION)**CONSENT TO PARTICIPATE IN A SURVEY STUDY TO ASSESS AVAILABILITY AND KNOWLEDGE OF HEALTH CARE PROVIDERS ON STOCK MANAGEMENT OF EMERGENCY OBSTETRIC CARE PRODUCTS IN PUBLIC HEALTH FACILITIES IN DAR ES SALAAM REGION.**

Greetings!

My name is Bora J. Makuta for Muhimbili University of Health and Allied Sciences(MUHAS). I am conducting a survey study on the problem of availability of emergency obstetric care products in public health facilities found in Dar Es Salaam region.

Purpose of the study

The study will determine the availability of EmOC products as well as knowledge of health care providers on stock management of EmOC products in Dar Es Salaam region.

Participation

If you agree to participate in this study, you will be required to answer all the questions that will be asked by the investigator in form of interview.

Confidentiality

All the information that you will provide will be treated in a very confidential manner and it will not be used for any other purpose other than this study.

Risks

We do not expect any harm to happen to you because of joining in this study.

Rights to withdraw and Alternatives

Taking part in this study is completely your choice. If you choose not to participate in the study or if you decide to stop participating in the study you will continue to be treated normally. You can stop participating in this study at any time, even if you have already given your consent and if for any reason you would wish to come back into the study after withdrawal, we will be ready to accept you to continue with the study. Refusal to participate or withdrawal from the study will not involve penalty or loss of any benefit to which you are otherwise entitled.

Benefits

By participating in this study you will contribute to reduce the problem of poor medicine supply system of EmOC products at facility levels. Your information and others participating in the study will collectively be used by policy makers in addressing this problem hence protecting the pregnant women and the health of Tanzanians in general. You will receive new information about this study once completed.

Who to contact

If you ever have any question about this study, you should contact the following:

Ms Bora J. Makuta(Principal Investigator)

School of Pharmacy

Muhimbili University of Health and Allied Sciences

P.O.BOX 65001, Dar Es salaam.

Mobile phone: 0753 081705

Dr. G.A. Kagashe (Study Supervisor)

School of Pharmacy

P.O.BOX 65013, Dar es salaam.

Mobile Phone: 0713 310511

Also, if you will have questions about your rights as a participant, you may consult the Chairman of the College Research and Publications Committee,

P.O. Box 65001, Dar Es Salaam.

Signature

Do you agree to participate? *Write the word 'Yes' if you agree.....*

I, _____ have read the contents in this form. My

Questions have been answered. I agree to participate in this study.

Signature of participant _____

Signature of investigator _____

Date of signed consent _____

APPENDEX 8: CONSENT FORM (SWAHILI VERSION)

FOMU YA RIDHAA YA KUSHIRIKI KATIKA UTAFITI

UFAHAMU NA NJIA ZINAZOTUMIKA K KUHUSU KUANGALIA UPATIKANAJI WA MADAWA NA VIFAA TIBA VYA HUDUMA ZA ZARURA ZA UZAZI NA UELEWA WA WATAALAMU WA AFYA KUHUSU ISIMAMIZI KATIKA VITUO VYA UMMA MKOANI DAR ES SALAAM

Salaam!

Mimi naitwa Bora Jasmine Makuta kutoka Chuo Kikuu cha Sayansi za Afya Muhimbili.

Ninafanya utafiti kuhusu upatikanaji wa madawa na fivaa tiba vya huduma za zarura za uzazi katika vituo vya afya vya umma katika mkoa ya Dar es salaam.

Dhumuni la utafiti huu nikuangalia upatikanaji wa madawa na vifaa tiba na uelewa wa wataalamu wa afya kuhusu usimamizi wa madawa na vifaa tiba yanayo tumika kwenye huduma za zarura za uzazi.

Kama utakubali kushiriki katik utafiti huu, utahitajika kujibu maswali yote utakayo ulizwa na mtafiti katika fomu hii ya maojiano.

Taarifa zote utakazotoa, zitakua ni siri na hazita tumika katika shughuli nyingine yoyote ila utafiti huu.

Hatu tegemei wewe kupata madhara yoyote kutokana na ushiriki wako katika utafiti huu.

Kushiriki katika utafiti huu ni chagua lako. Ukichagua kutoku shiriki au ukiamua kuacha utaendelea kuhudumiwa kama kawaida. Unaweza kuacha kushiriki katika utafiti huu muda wowote, hata kama umesha toa ridhaa ya kushiriki.

Kwa kushiriki katika utafiti huu utasaidia:

1. Kujua uelewa wako kuhusu usimamizi wa madawa na vifaa tiba, na jinsi ya kuboresha.
2. Kwa mama mja mzito itasaidia aweze kupata huduma nzuri akirudi tena kuji fungua.

Ukiwa na swali au tatizo lolote unaweza kuwasiliana na:

Bora Jasmine Makuta,

Chuo Kikuu cha Sayansi za Afya ,Muhimbili,

S.L.P 65001, Dar es salaam

Simu ya mkononi : 0753 081705, au

Dk G. A. Kagashe (msimamizi wa utafiti)

Chuo Kikuu cha Sayansi za Afya ,Muhimbili,

S.L.P 65013, Dar es salaam

Simu Na: 0713 310511

Kama utakuwa na suala lolote kuhusu haki yako kama mshiriki katika utafiti huu

wasiliana na ,Mwenyekiti wa Kamati ya Utafiti na Uchapishaji, Chuo

kikuu cha Afya na Sayansi ya Tiba, S.L.P 65001, Dar es Salaam.

Je, unakubali? Andika ndio kama umekubali.....

Miminimeisoma fomu hii na kuelewa lengo la utafiti huu na maswali yangu yamejibiwa na sasa nakubali kwa hiari kujiunga na utafitihuu.

Sahihi ya mshiriki.....

Sahihi ya mtafiti.....

Tarehe ya kusaini.....

APPENDIX 9: LIST OF PUBLIC HEALTH FACILITIES IN THE THREE MUNICIPALITIES OF DAR ES SALAAM REGION

Region	Council	Name	Type
Dar es Salaam	Ilala MC	Bonyokwa	Disp
		Buyuni	Disp
		Chanika	Disp
		FFU Ukonga	Disp
		Gerezani	Disp
		Guluka kwa Lala	Disp
		Kajiungeni	Disp
		Kinyerezi	Disp
		Kitunda	Disp
		Kivule	Disp
		Kiwalani	Disp
		Majohe	Disp
		Mongolandege	Disp
		Msongola	Disp
		Mvuti	Disp
		Segerea	Disp
		Tabata A	Disp
		Tabata Kisiwani	Disp
		Tabata NBC	Disp
		Vingunguti	Disp
		Yombo Ufundi	Disp
		Zingiziwa	Disp
		Buguruni	HC
		Mnazi Mmoja	Hosp.
	Kinondoni MC	Boko	Disp
		Bunju	Disp
		Goba	Disp
		Hanasif	Disp
		Kawe	Disp
		Kibamba	Disp
		Kibwegere	Disp
		Kijitonyama	Disp

		Kiluvya	Disp
		Kimara	Disp
		Kisopwa	Disp
		Kogogo	Disp
		Kunduchi	Disp
		Kwembe	Disp
		Kwembe	Disp
		Mabibo	Disp
		Mabwe Pande	Disp
		Madale	Disp
		Magomeni	HC
		Makongo Juu	Disp
		Makuburi	Disp
		Mavurunza	Disp
		Mbezi	Disp
		Mbopo	Disp
		Mburahati	Disp
		Mbweni	Disp
		Mikocheni	Disp
		Mlalakuwa	Disp
		Mpiji Magohe	Disp
		Mpiji Mbweni	Disp
		Msewe	Disp
		Msumi	Disp
		Mwananyamala	Hosp
		Mwenge Disp	Disp
		Mzimuni	Disp
		Ndumbwi	Disp
		Oysterbay Police	Disp
		Sinza	Hosp
		Tandale	Disp
		Tegeta	Disp
		Ununio	Disp
		Wazo	Disp
	Temeke MC	Buyuni	Disp
		Buza	Disp
		Chamazi Disp	Disp

		Chekeni Mwasonga	Disp
		Gezaulole	Disp
		Gomvu	Disp
		Kibada Disp	Disp
		Kibungumo	Disp
		Kichemchem	Disp
		Kilakala	Disp
		Kimbiji Disp	Disp
		Kisarawe II	Disp
		Kizuiani Mbagala	Disp
		Makangarawe Yombo	Disp
		Mbagala Round Table	Disp
		Mbande Disp	Disp
		Mbutu	Disp
		Mjimwema	Disp
		Mwembe Yanga	Disp
		Mwongozo	Disp
		Mzinga	Disp
		Mzinga (Kongowe)	Disp
		Nunge	Disp
		Puna Senta	Disp
		Rangi Tatu Mbagala	Disp
		Temeke	Hosp.
		Tambuka Reli	Disp
		Toangoma	Disp
		Tundwi Songani	Disp
		Yaleyalepuna	Disp
		Yombo Kilakala	Disp
		Yombo Vituka	Disp
		Kigamboni	HC