ASSESSMENT OF LOGISTIC MANAGEMENT INFORMATION SYSTEM PRACTICE FOR REPRODUCTIVE HEALTH PRODUCTS IN HEALTH COMMODITY MANAGEMENT INFORMATION SYSTEM IMPLEMENTING FACILITIES IN GONDAR, NORTHWEST ETHIOPIA

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A RESEARCH PAPER SUBMITTED TO DEPARTMENT OF PHARMACY, COLLEGE OF PUBLIC HEALTH AND MEDICAL SCIENCE, JIMMA UNIVERSITY; IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR MASTER OF DEGREE IN PHARMACEUTICAL SUPPLY CHAIN MANAGEMEN

June 2015

JIMMA, ETHIOPIA

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June 2015

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Abstract

Back ground: Logistic management information system (LMIS) has been recognized as one of major factor for sustainable flow of Family planning (FP) and maternal health products in the logistic system.

Objective: To assess the status of LMIS for reproductive health products in health commodity management information system (HCMIS) implementing public health facilities in north and south Gondar zones.

Methods: A facility based cross sectional descriptive study was conducted in all HCMIS implementing public health facilities. All HCMIS graduated health facilities were included in the study. The association between selected categorical variables examined using chi-square test at $P < 0.05$ statically significant level. The study was conducted from March 1 to 30, 2015 in north and south Gondar zones.

Result: There exists a well-designed logistics system for FP and maternal health products with LMIS trained pharmacy professionals, distributed standard LMIS formats and established forced ordering maxi- mini inventory control procedures. Majority, 17 (81%) and 12 (57.1%) of health facilities had stock outs in the past six months and at the time of visit respectively for at least one FP and maternal health products. The most frequently stock out products were magnesium sulfate 10(47.6%) and misoprostol 6(28.6%) in the past six months. 98.7% of health facilities were using stock/bin cards for managing FP and maternal products, among these 82.8 % of health facilities had updated stock/bin cards. An average 55.4% of health facilities had accurate stock/bin card balances for FP and maternal products. Fifty six percent of health facilities had complete and accurate RRF report for FP and maternal products. IPLS training and supervision have significant association (p=0.041) with bin/stock card accuracy.

Conclusion: Even though there exists a well-designed LMIS of family planning and maternal health products with trained pharmacy professional, record keeping quality of stock/bin cards and LMIS reports were low. Key lifesaving maternal health products were stock out at health facilities at the day of visit and during the past six months. Based on findings, regular supervision across all health facilities with prepared standard check list and keeping accurate records and report formats are recommended.

Keywords: LMIS, stock out, HCMIS, inventory management, family planning and maternal health products

Acknowledgements

First I'm grateful to Almighty Lord "God" and his mother "Saint Mary" who gives me strength and health in all my activities.

I would like to express my heartfelt gratitude to my thesis advisors: Mr.Seid Mussa and Mr.Yared Yigezu for their unreserved assistance all the time and guidance they provided generously at every single stage of the development of this paper and supplied documents which were relevant for my study.

I am very thankful to Jimma University for giving me the opportunity to study Master of Science in pharmaceutical supply chain management.

I am indebted to Teshome Diress and Admasu Teshome for their important comments during proposal development and supplied documents which were relevant for my study.

My thanks also extended to all the professional and administrative bodies at the study area for their willingness to participate in the study.

Finally, I would like to express great thanks to my parents and friends for their moral support during my study.

List of Abbreviations and Acronyms

CLMIS: Computerized Logistic Management Information System

CPR: contraceptive prevalence rate

DHS: demography health surveys

ECP: emergency contraceptive pill (levonogesterol)

EPO: emergency order points

FMOH: Federal Ministry of Health

FEFO: first-to-expire, first-out

FP: family planning

HCMIS: health commodity management information system

IUCD: intra uterine contraceptive device (cupper T)

IFRR: internal facility report and resupply form

LIAT: Logistics Indicator Assessment Tool

LMIS: logistic management information system

OCP: oral contraceptive pill

PFSA: Pharmaceuticals Fund and Supply Agency

POP: progesterone only pill

UNFPA: united nation population fund agency

RIRF: Requisition, Issue, and Report Form

RRF: report and requisition form

RHC: reproductive health commodity

SDPs: Service Delivery Points

SPSS: Statistical package for social sciences

WHO: world health organization

ART: antiretroviral therapy

Operational definitions

Reproductive health commodities/products/: products used to prevent maternal mortality during delivery related complication and prevent the occurrence of pregnancy; it includes three lifesaving maternal health products and family planning products

Family planning products/ commodities/- products used to prevent the occurrence of pregnancy.

Lifesaving Maternal health product: products used to manage delivery related complication (post-partum hemorrhage and pre-eclampsia); it includes three lifesaving maternal health products

Logistics: the set of activities that control how materials and products move from the initial source to the end user.

Logistics management information system (LMIS): a manual or computerized system that collects, processes, and reports data that enables to make logistics system decisions.

Adjustments: Changes to inventory records to reflect losses or transfers of products or commodities, or to correct record keeping errors.

Accuracy - The matching of stock on hand on stock/bin cards with physical count or with LMIS report quantity

Commodities/products: the items that flow through a logistics system.

Completeness: reporting forms were filled all the column blank space for FP and maternal products (stock on hand, issued and losses/adjustments)

Expired products: Product that was unfit for use at the time of visit due to damage, wastage, beyond expiry date or other reasons

Nearly expired products: products that had less than six months for expiry date

Health commodity management information system (HCMIS) tool: transaction and inventory management software developed by USAID/DELIVER project and deployed in health facilities in the study area.

Maximum/minimum (max/min) inventory control system: a system to ensure that the quantities in stock fall within an established range.

Re-initiated phase of HCMIS: a health facility that the HCMIS failed earlier by any reasons but now restarting the system again

Intensive phase of HCMIS: first phase of HCMIS implementing by giving training for health professional and also registration of products to the system, not fully practicing the system for transaction recordings. They need supporting from higher level.

Inactive HCMIS: a health facility that implemented the HCMIS tool previously but now the system is failed by any reasons and not practicing the system

Graduated stage of HCMIS: health facilities are implementing and practicing the HCMIS tool and store manager is working/run/ the system independently and also any transaction is recorded in the HCMIS tool

On-the-job training: Pairing a trainee with an experienced colleague or supervisor to help the trainee acquire a set of specific skills.

Overstock: A supply imbalance that occurs when stocks exceed the established maximum stock level

Order fill rate: describe that the facilities were received either less or higher quantity than their ordered quantities or received equal to ordered quantities

Reports: forms on which all essential data items for a specific facility and for a specific time are moved from one level in a logistics system to another.

Facilities/ (SDPs): any institution that store of family planning and maternal products and also providing maternal and family planning service which includes hospitals and health centers.

Stock/bin card: a generic name for an inventory control card that holds information about a single product

Stock out: Depleted supply of a given product or products; a zero stock balance or temporary unavailable in the warehouse (store).

Under stock: A supply imbalance that occurs when stocks fall below the established Minimum stock level

Zone: is administrate hierarchy structure of classification based on geographical location, it found above woreda (district) and below region

Inventor control: a system informs the storekeeper when to order or issue, how much to order or issue, and how to maintain an appropriate stock level of all products.

Stock availability: is determine how many months of stock on hand in the store available and to know whether facilities are keeping the appropriate quantities on hand or not(stock out or expired products). The current stock on hand in the store was divided by average monthly consumption to determine months of stock on hand. Months of stock on hand were compared with established minimum and maximum stock levels.

Health center: a health facility and under a primary health care unit level that serving around 25,000 peoples

Primary/district hospital: a health facility and under a primary health care unit level that serving from 60,000 to 100,000 peoples.

General/ Zonal hospital: A health facility that serving a threshold value of 1 million to 1.5million peoples

Specialized/ Referral hospital: a health facility that serving a population of 3.5 million to 5 million.

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1. Introduction

1.1. Background

A supply chain is the series of activities that mange flow of product, information, money from initial suppliers to final users (1). Logistics is part of supply chain management that studies a process of planning, implementing and controlling the efficient, effective flow of health commodities and storage of goods, services and related information between the point of origin and the point of consumption in order to meet customers' requirement (2).

Logistic management information system (LMIS) is a system of recording, reporting of essential logistics data either paper based or computer based automated system, that are important for making logistic decisions throughout the supply chain with accurate, timely, appropriate logistic data. A well-functioning LMIS provides decision-makers throughout a supply chain with accurate, timely, and appropriate three essential data: such as stock on hand, losses/ adjustments and consumption data for health commodities managed in the system (3). Family planning(FP) and Maternal health commodity LMIS is management of FP commodity in systematic way by collecting, organizing, reporting and utilizing logistic data to uniform quantification, procurement, resupply and storage of FP and maternal health commodities (4). LMIS can account for products in the supply chain and reduce loss, waste of supplies, stock outs, and overstocks which ultimately improve the program effectiveness and improve FP commodity security(5).

An LMIS works only if the essential data flow efficiently throughout the system and decisions are based on stock on hand, consumption and loss/adjustment data. Logistics information available through the LMIS drives all decisions in the supply chain, and enables managers to operate supply chain functions including forecasting, quantification, and inventory management (6). A logistics system provides quality customer service by fulfilling six rights: ensuring that the right information on the right FP and maternal commodity in the right quantities at the right time and right place for making the right decisions on what, when and how much to order (4).

Computerized logistics management information system (CLMIS) is one tool of LMIS to facilitate the work of supply chain managers by enabling faster collection, and aggregation of

data and reducing human error in calculations. Reducing the time required for data collection and aggregation results in data being available more quickly for timely decisions and actions to help ensure FP commodities are available where and when needed (7). Automation is the only way to manage the large number of products in the integrated logistic system (ILS). ILS integrates all or most vertical program which enhances accountability, product availability and provides the higher level with data for decision making, resupply, and procurement or forecast (8). Automated health commodity management information system (HCMIS) and paper based LMIS should help make data accessible at all facility levels and available for logistics decision-making (9).

In Ethiopia all public health facilities obtained essential products like FP products primarily through the integrated pharmaceuticals logistics system (IPLS), a single reporting and distribution system based on the overall mandate and scope of the national Pharmaceuticals Fund and Supply Agency (PFSA). FP and maternal commodities flow down from central PFSA to PFSA hubs, hospitals and health centers. If stock on hand for any commodity falls below 2 weeks (0.5 months) of stock before the end of the reporting period, an emergency order should be placed(10).

Ethiopia designed new LMIS to increase the availability of FP and maternal commodities. Logistics information like RRF is collected and reported every other month by Health Centers and Hospitals using LMIS forms to the next higher level (PFSA& regional health bureau). A copy of the Health Center and hospital report should be sent to the Woreda/zone/ Health Office and regional health bureau respectively for management and supervision purposes (10, 11).

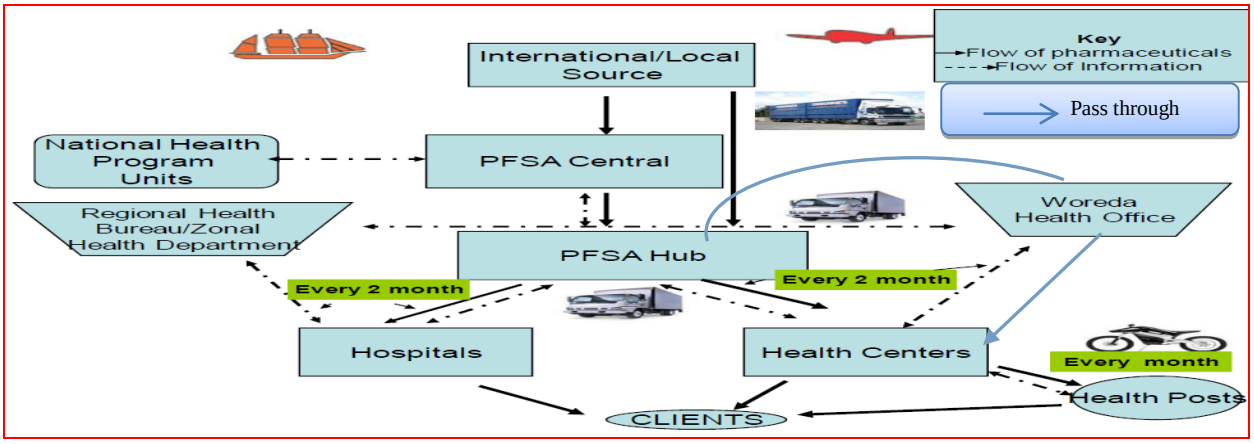


Figure1: Integrated Pharmaceutical Logistics System (from SOP manual for IPLS, 2014, page 3)

1.2 Statement of the problem

Poorly designed of LMIS for reproductive health commodity is hinders the availability of reproductive health commodities and affect the quality of reproductive health services, in addition, it results in incorrect quantification, supply of inadequate quantities of commodities and stock out (12). Without adequate supply of reproductive health commodities, no program can meaningfully improve the reproductive health services at service delivery points. To ensure uninterrupted availability of reproductive health products, strong commodity management and information system at health facility is crucial (13). Increasing availability of maternal health products is one of the most effective ways to achieve the target for Millennium Development Goal 5 (12).

Inaccessibility of maternal health service is one of the major factors for maternal death. Eleven countries including Ethiopia account for 65% of all global maternal deaths due to inaccessibility of lifesaving maternal health services (14). A potential barrier for lack of access to maternal health services is commodity security. LMIS is the driver of logistic system and significant improve commodity security. Strong supply system and LMIS contribute to reduction of maternal mortality by avoiding stock outs and ensure medicine accessibility (14, 15).

According to 2008 united nation population fund (UNFPA) report (2008), in developing countries like Ethiopia, Burkina Faso, Niger and Laos, one of the challenges to secure reproductive health commodity was weak LMIS in terms of data collection, incomplete and inaccurate reporting and request form (RRF) and feedback (16).

There were many common challenges to reproductive health commodity security in West Africa; some of the challenges in the areas were weak national logistics information systems for managing reproductive health commodities, duplication of efforts leading to unnecessary redundancies and an inefficient use of the limited resources available for Reproductive health. These weak logistics information systems lead to expired products, supply imbalances (overstock), and stock outs at service delivery points (SDPs) (17).

FP and lifesaving maternal health commodities accessibility is low in Tanzania. Some problems related to logistic management information systems are, no standard report form, long time

taken for report to move from facilities to higher level and unregularly reporting, uncompleted reporting, some facilities were not placing orders for certain commodities even if they were out of stock, also health providers had not been trained on integrated logistic system how to fill the form, generally there was weak logistic management information system that caused frequent stock outs of critical commodities (18).

According to the Ethiopia demography and health survey (DHS) 2011, modern contraceptive methods prevalence rate was 20% (19). One of target of the Ministry of Health with respect to improving maternal health is to increase the contraceptive prevalence rate (CPR) to 66 % by 2015. In order to achieve this target, increasing awareness of family planning users and also increasing need for improvement of the contraceptive logistics system in the country (20).

Efficient logistic management information system is one of the strategies to increase the access of FP commodities (21). A well-designed program of training and supervision, combined with an LMIS design that emphasizes the use of data at the point of data collection, will help minimize problems of data accuracy and validity.

FP and lifesaving maternal health commodities supply chain can't function effectively without timely, accurate logistic data; LMIS is an essential tool for logistic manager and policymaker (22). Without quality logistics data, supply systems face to stock outs or stock imbalances which make the system unresponsive to health facility and patient needs (23).

In Ethiopia, the commonly cited reasons for stock out of reproductive health commodities were attributed to Logistics Management Information system. One of the factors that contribute to low use of Family planning services was Poor Logistics Management Information System of family planning commodities. Strengthening the LMIS is one of the important parameter for product accessibility and to ensure sustainable family planning and maternal health services (24).

In Ethiopia some hospitals and health centers started using an automated Health Commodity Management Information System (HCMIS) for transaction and inventory management purpose and easy access to information on existing stock level. In HCMIS implementing health facilities

also proper use of the Internal Facility Report and Resupply Form (IFRR) and the Report and Requisition Form (RRF) are critical indicators of a strong supply chain and logistic information (25). However, there are challenges on LMIS on the format, RRF reporting data quality problems. As a result, reproductive health commodities like Depo-Provera, combine oral pills and female condoms is limited (26).

Health facilities in west Amhara there was weak logistic information system and inventory management system that contributes inadequate availability of reproductive health products and also IPLS was not well integrated (27) and in the region there was high demand (56%) of FP products (19). North and south Gondar zones have high number (52.5%) of graduated HCMIS health facilities compared with others west Amhara zones.

Several studies have been conducted to see the status of logistics management information system of FP commodities in other parts of the world (29, 34, 35, 36, and 41); however, In Ethiopia there is limited information for logistics management information system of FP and lifesaving maternal health commodity. Therefore, this study is designed to assess the status of logistics management information system of FP and lifesaving maternal health commodity at HCMIS implementing public health facilities in north and south Gondar zones.

2. Literature review

Reproductive health commodities were still not available in developing countries, because of inadequate information on logistic related to lack of standardization of collection and reporting formats, frequent running out of stock, poor management of logistics, lack of training, and supervision on logistics (28).

A study conducted in Philippines on FP and maternal health products logistic management assessment revealed that thirty five percent and 30% of health facilities were stock out of Depo-Provera and combine oral pills on the time of visit. Eighteen percent and 53% of health center experienced stock out for IUCD and injectable respectively in the previous six months. Utilization of stock cards was very poor in all hospitals and health centers, none of the hospitals managing FP products maintained any stock cards, but for maternal products were used, particularly for magnesium sulfate. Twenty seven (13%), 26 (13%), 6(5%) and 35(12%) of health centers (rural) had available stock/bin cards for microgynon, male condoms, oxytocin and Depo-Provera respectively. Twenty three percent of health centers had updated stock/bin cards for family planning and maternal health products, but no hospital found that had updated stock/bin cards. The majority personnel staffs trained to complete logistic forms and reports through on-the-job training, in both hospitals (73%) and health centers (63%). Fourteen percent of health centers were visited by supervisors within the last six months and higher than compared to hospitals. (29).

In Bangladesh public health facilities study showed that 7(47%), 7(47%), 6(40%) and 8(53%) of health facilities had in stock for oxytocin, misoprostol, magnesium sulfate and implants respectively on the day of visit. But all health facilities were stock out of emergency contraceptive (30).

A study conducted in Tanzania on FP and reproductive health commodities supply chain showed that there was week record keeping; inaccurate demand information and the stock balances on the stock card did not match physical count on the time of visit. The LMIS was faced with RRFs not being filled accurately by 29% of the health facilities. Fifty- seven percent and 57% of hospitals were stock out of Depo-Provera and implanon respectively in the past six months. Nineteen percent of facilities had expired products of microgynon and condoms and 30% of

them stored separately. Twelve (100%) hospitals and 69(98.6%) of health centers had received supervision visits from higher levels, among these 7(58.3%) of hospitals and 39(55.7%) of health centers were supervised quarterly. All hospitals (12) and 51(72.9%) of health centers were supervised using checklist during supervision. Higher level supervisors were shared the supervision finding on job training in all hospitals and health centers (18).

Furthermore study in Tanzania showed that 56% and 52 % of health facilities were stock out of Depo-Provera and male condoms respectively. Some facilities were not fully completed their report and request forms (RRF) according to integrated logistic system guidelines. Only 20 percent of all facilities submitted RRF with dates that indicated the RRF had been delivered to the district on time and in the correct delivery form and also there was a long delay between when the facility completed the form and when it arrived at the district levels (31).

A study done in Uganda on reproductive health showed that stock cards were present in all urban facilities. Female condom was poorly stocked across all public facilities. The duration of the stock out of Depo-Provera was between 1-3 months in 60% of public facilities. The top three commodities that frequently experience stock outs were Condoms, Depo-Provera and emergency pills in the past six months. During stock outs, majority 60% of health facilities were referred the patients to other health facilities and 59% of public facilities were borrowed from other public facilities. The duration of the stock out of Depo-Provera was between 30 to 90 days in 60% of public health facilities (32).

A health facilities survey conducted in Kenya showed that utilization of stock cards was 39% and 55% at health centers and hospitals respectively for managing FP products. Seventy one percent, 63.3%, 50.0%, 62.5% and 56.3% of health centers had updated stock/bin cards for microgynon, IUCD, jadelle, emergency pills, and male condom respectively. Thirty percent of hospitals and 48.6% of health centers had accuracy stock/bin cards with physical count for family planning products. Minimum/maximum stock levels were set for FP commodities are 3 and 6 months of stock respectively. At health centers, male condoms were overstocked at 20 months of stock, while all others were below minimum stock level (microgynon, minipills, injectable, jadelle, IUCD and emergency pills). At hospitals, microgynon, jadelle and

emergency pills were within minimum and maximum stock levels. IUCD was overstocked at 19 months of stock, while all other commodities were below minimum stock levels (mini pills, injectable, male condom). More than 60% of health facilities were stock out more than 120 days for minipills in the past six months. The most frequent stock out FP commodity was injectable in health centers and hospitals. Nurses were the responsible person for managing FP commodities and more than 70% of commodity managers at all health facilities levels were trained in logistics either through workshops or on-the-job training (33).

A study done in Nigeria revealed that 80.1% of health facilities had available stock/bin cards for managing FP products. Fifty seven percent of health facilities had accuracy of stock cards with physical count of those products. Seventy one percent of health facilities were found to have sent complete and accurate RRF reports. Thirty percent of health facilities were stock out of FP products at the day of visit. Fifty percent, 83(40%), and 20(10%) of health facilities were stock out of implanon, Microgynon and IUCDs respectively in the past six months. The average duration of the stock out was generally more than 60 to 75 days for all contraceptives within the past six months. Minimum stock level for health facilities was two months. Eighty-four percent of health facilities personnel had received LMIS training, majorities (92%) personal were trained formal LMIS workshop training. About seventy five percent of SDPs did not place emergency order in the past six months. Forty seven percent of SDPs had received a supervision visit in the past 4 months (34).

Another similar study was done in Nigeria showed that 57% of SDPs had available stock cards, although the percentage of those with updated cards was on average almost 90 percent before one month prior the survey and 44 % of health facilities had accuracy of stock cards with physical count of those products. Ninety one (50.6%), 114(54.3%), 58(49.6%), 100(53.8%, 15(55.6%) and 12(54.5%) of health facilities had updated bin/stock cards for Male condom, Depo-Provera, IUCD, Microgynon, Implanon and Jadelle respectively a month prior the survey. Over 75 percent of SDPs did not place emergency orders in the past six months, About 30% of SDPs were stock out of FP products on the of day visit. Average number of stock out was around two times for jadelle. Sixty percent of SDPs had sent an order within the last two months to higher level in the last order and report period. Forty two percent of health facilities had

complete and accurate RRF (LMIS) reports. Almost 30% of store managers reported not conducting any supervisory visit in the past six months. Seventy five percent of health facilities order fill rate was accurate in which FP products receive equal amount of quantities ordered, 12% of SDPs received more product than they requested and 13% of SDPs received less product than they requested (35).

A health facilities survey conducted in Zambia study revealed that around 70% of health facilities were using stock cards for managing family planning products and Over 70 percent of available stock cards were updated for health facilities, with the exception of IUDs. Utilization of stock cards for magnesium sulfate was the lowest for health facilities at around 25 percent. More than 60% of health facilities were stock out for female condom, IUCD, Jadelle and minipills, but Male condoms were found in all facilities on the day of visit. Depo-Provera was at the SDP level for an average of 30 days. Hospitals minimum/maximum stock levels were set 2 months and 3 months respectively for family planning and maternal commodities. Six (66.6%) of urban health centers had stock in for oxytocin available on day of visit. Thirty percent and around 10% of health facilities were stock out for oxytocin and magnesium sulfate respectively on day of visit (36).

Assessment of pharmaceutical logistic system in south Sudan revealed that majority of assessed health facilities lack of stock cards for inventory control. Eighteen percent of health facilities consistently send report to their higher level, but not collected all the essential logistics data, this data influence decision making on supply chain Management. Health facilities had not set maximum-minimum stock levels (37).

A study conducted in Ghana showed that, majority of hospitals and health centers had in stock for three lifesaving maternal commodities but 4% and 9% of health facilities were stock out of oxytocin and magnesium sulfate respectively in the past six months. Nationally 89% of all health facilities had at least one type of contraceptive in stock. Fewer than 40% of facilities had IUCDs, implants, or emergency pills in stock (38).

A health facility survey conducted in Addis Ababa city administration in Ethiopia showed that, Forty nine (73.1%) of the facilities reported that they usually run out of at least one contraceptive method they manage before re supplying the past six months. Thirty eight facilities (56.72%) were stock outs at the time of visit for at least one product they manage in their facilities. Eight (13.79%) of facilities were currently using stock/bin cards for all types of contraceptives, only 14(58.33%) of facilities had updated bin/stock cards with accurate information matching with the physical count done at the time of visit. 56 (96.55%) of the facilities reported to have sent their logistics reports to the next higher facility within the last month (39).

A cross-sectional study in Ghana revealed that the availability of stock cards for family planning products was found low. Forty eight percent of health centers and 75% of hospitals had stock cards for contraceptive. Fifty eight percent of hospitals and 35% of health centers had updated stock cards within 30 days of the visit. Forty two percent of facilities had accurate stock cards for contraceptive. Nineteen percent or more facilities experienced at least one stock out in the past 6 months. Nine (1%) of health facilities were found to have expired condom. Seventy percent of facilities had received a supervision visit within the last quarter. Seventeen percent of hospitals were stock outs for Depo Provera and male condoms at the time of visit. Hospitals and health centers had a minimum- maximum inventory stock level was 1 and 3 months respectively (40).

A study conducted in Ethiopia showed that more than 80% of health facilities were stock out for magnesium sulfate at the time of visit. Average duration of stock out was about 150 day for female condom, IUCD and implants. Male condoms, microgynon and Depo-Provera were out of stock for less than 60 days in the past six months. Large proportion of the facilities had in stock with oral pills (97.2%) followed by Depo-Provera (96.0%), male condoms (94.1%), implants (79.5%) and UCD (55.3%) at the time of visit (24).

A cross-sectional study in Ethiopia showed that 47.5% and 26.7% of health facilities had in stock for misoprostol and magnesium sulfate at the time of visit. 98.8% of SDPs had in stock at least one family planning products at the time of survey. There was improvement in stock availability of FP and lifesaving maternal health products with compared with 2010 study (41).

Furthermore study done in Ethiopia also showed that Depo-Provera, microgynon, and male condoms, Oxytocin, Magnesium sulfate and Misoprostol were available in 97.6%, 95.2%,95.2%, 94.1%, 55.6%, and 71.1% of the SDPs respectively at the time of visit. 96.7% and 96% of health facilities had one or more FP products in stock in the country and Amhara region respectively at the time of the survey, this 96% was the least percent next to Afar region in the country. Over the three years period showed improved availability of Injectable, Implants and IUCDs (42).

Assessment of reproductive health commodities in Ethiopia showed that 99.5% public facilities had in stock at least one type of modern contraceptive method at the time visit. 61.1%, 42.2%, 1.8%, 4.7%, 14.2%, 35.1% and 13.2% of SPDs were stock out for Magnesium sulfate, misoprostol, Depo-Provera, male condoms, microgynon, IUCDs and oxytocin respectively at time of visit and also Some SDPs were reported stock out of male condoms (5.8%), Depo-Provera (6.3%), oral pills (21.4%) and IUCDs (37.5%) in the last six months. The availability of Oxytocin and Magnesium Sulfate were dropped from 94.1% to 86.8% and from 55.6% to 38.9% respectively with compared to 2012 study (43).

A cross-sectional quantitative assessment of integrated pharmaceutical logistic system in Ethiopia showed that 73% of hospitals and 64% of health centers were using bin cards for family planning and other health products. Sixty four percent and 53% of hospitals had updated bin cards for Depo-Provera and oxytocin respectively and also 65% and 63% of health centers had updated bin cards for Depo-Provera and oxytocin respectively within the previous 30 days. Sixty percent and 40% of hospitals had accurate bin cards for oxytocin and Depo-Provera respectively and also 54% and 43% of health centers had accurate bin card for oxytocin and Depo-Provera respectively at the time visit. More than 90 percent of facilities submitted their reports every two months and 85% of health facilities sent complete RRF report to higher levels for FP and other health products. An average, 46% of facilities summited accuracy RRF report to higher level for FP and other health products. Fifty percent and 30% of health facilities sent accurate RRF reports to higher level for implanon and Depo-Provera respectively. Sixty eight percent of the hospitals and 43% of the health centers were placed emergency orders in the past three months. Seventy eight percent of health facilities had received supervision from higher levels. Oxytocin high frequency stock out in health centers (44).

2.1. Conceptual framework

The conceptual framework was developed by reviewing different literature. It showed that the possible interrelationship between variables of LMIS status of FP and lifesaving maternal health products in HCMIS implementing health facilities. These are logistic report and record data related and organizational support and staffing.

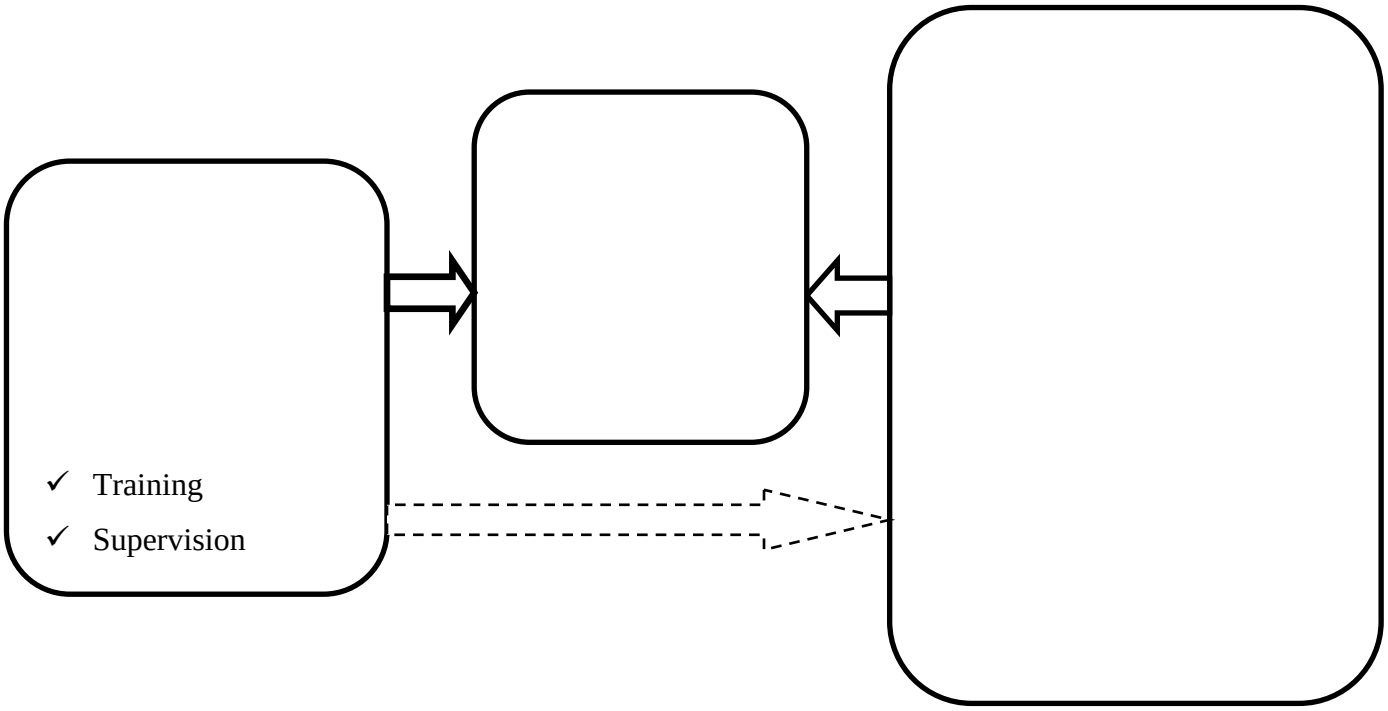


Figure 2: conceptual framework for logistic management information system status of FP and lifesaving maternal health products (developed from different literatures).

2.2. Significance of the study

Reproductive health products should help people to take control of their lives, as well as their fertility and reduce maternal mortality. Logistic management information system is one of the important parameter for FP and maternal product availability with sustainable flow of FP and lifesaving maternal health products from suppliers (PFSA) to health facilities.

There is limited study done on assessment of LMIS status of family planning and lifesaving maternal health products in HCMIS implementing public health facilities in Ethiopia. Therefore, this assessment will help to improve the design and operation of the logistics data collection and utilization of data for decision of key logistics activities.

This study will also help to assess stock availability of FP and maternal health products and also identify what gaps are there regarding to Logistic management information system. Based on the finding to design of suitable interventions may be planned in the future in order to improve and strength the LMIS reporting system.

The finding of this study will also provide base line data for Amhara regional health bureau (ARHB) and other interested partners who are working on logistic management information system of family planning and maternal health products.

3. Objectives

3.1. General Objective

- To assess the status of logistic management information system for reproductive health products in HCMIS implementing public health facilities in North and South Gondar zones, northwest Ethiopia

3.2. Specific objectives

- To describe the actual practice of the design and operation of LMIS for family planning and maternal health products
- To assess the stock availability of family planning and maternal health products at health facility level.
- To assess the utilization of logistics data for decision making

4. Materials and methods

4.1. Study area and period

The study was conducted in north and south Gondar zones public health facilities. North and south Gondar zones are found in northwest part of Ethiopia and west part of Amhara region. In the two zones, there are 38 woredas and the total population was around 6,627,784. There are 219 public health facilities: one teaching Hospital, one general Hospital, two primary Hospitals and 215 Health centers (45). Among these facilities, all hospitals and 18 health centers are using automated health commodity management information system (HCMIS). In two zones have high number of HCMIS graduated health facilities compared with other west Amhara zones (46). The study was conducted from March 1 to 30, 2015.

4.2. Study design

A facility based cross-sectional descriptive study design using quantitative methods was used.

4.3. Population

4.3.1. Source population

The source population was all public health facilities in north and south Gondar zones of west Amhara region that manage family planning and maternal products using HCMIS and also providing family planning and maternal services.

4.3.2 Study population

Public health facilities that manage family planning and maternal health commodities using HCMIS and providing family planning and maternal health services were included as the study population.

4.4. Inclusion and exclusion criteria

4.4.1. Inclusion criteria

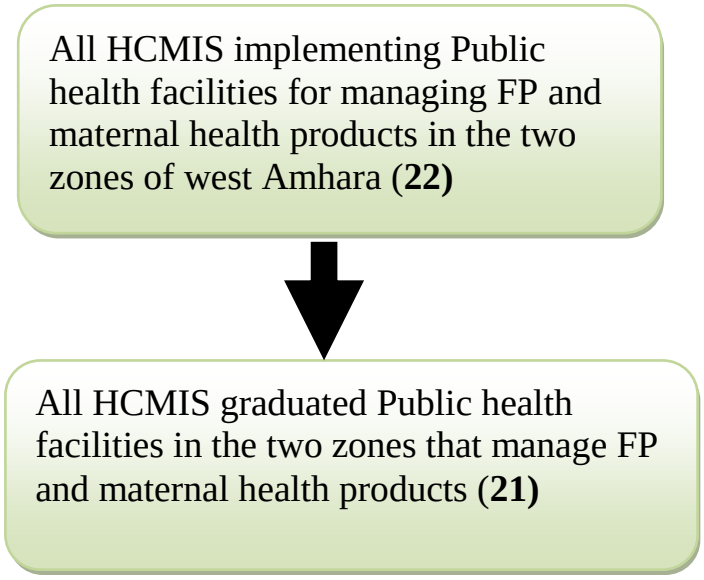
All health facilities that manage family planning and lifesaving maternal health products using HCMIS and graduated health facility that provide family planning and maternal health services.

4.4.2. Exclusion criteria

Health facilities having intensive phase, re-initiate or inactive phase HCMIS were excluded.

4.5. Sampling procedures

Since all graduated health facilities that manage FP and maternal using HCMIS were included in the study, there was no need of sample size determination. In the study area there are 18 health centers and 4 hospitals that manage family planning and maternal health commodities using HCMIS. Among these health facilities 4 hospitals and 17 health centers fulfilled the inclusion criteria.



4.6. Study Variables

4.6.1. Dependent variable

Status of logistic management information system

- Stock availability
- Min- max inventory control system

4.6.2. Independent variables

Organizational support and staffing related

- ✓ Training
- ✓ Supervision
- ✓ Facility type
- ✓ Logistic personnel

Logistics Reports and records related

- ✓ Stock/ bin card availability
- ✓ Stock/ bin card up to date
- ✓ Stock /bin card data accuracy
- ✓ RRF reports completeness and accuracy
- ✓ Ordering and receiving products

4.7. Data collection instruments and procedures

4.7.1. Data collection procedures

Data were collected by interviewer administered using structured questionnaire and physical inventory. The questionnaire was locally adapted from logistic indicator assessment tool (LIAT) (47). Supervision activities, logistic reports and recordkeeping formats adapted according to local context. LIAT used to collect quantitative information of logistics system from all HCMIS graduated health facilities in order to assess the availability of products, quality of records and reports. Four data collectors and two supervisors with B.pharm degree who have experience in pharmaceutical logistic management were provided intensive training about data collection tools and procedures for three days. The data collectors and supervisors were pharmacists and senior pharmacist respectively with experienced on FP and maternal health commodity logistic system. Since logistics records were documented in English, the data were collected in the same language as recorded. Interviewees were responsible for managing FP and maternal health commodities at all levels of health facilities. Interviews were held with pharmacy head and store manager at health facilities. The sources of data for the assessment were physical count of FP and lifesaving maternal health products, transaction record, bin/stock cards, and LMIS reports.

4.7.2. Data collection instruments

The questionnaire has two parts in English version. On the first part information was collected through interviewer administered. In the second part, a physical count of FP and lifesaving maternal health products was done in order to assess data quality of records and reports by comparing the actual counts with the available records.

The instrument was used to provide information on the indicators like availability of lifesaving FP and maternal health products by physical inventory on the day of visit, percentage of facilities with adequate stock ,inadequate and over stock levels by calculating months of stock on hand and comparing to minimum and maximum stock levels, percentage of facilities with personnel trained in LMIS, percentage of facilities supervision conducted, percentage of facilities that had expired commodities, facilities stock out of one or more facilities FP and maternal health commodities on day of visit, stock out frequency and average duration of stock outs, percentage of facilities that send logistics data to the next higher level of the system, stock keeping data quality by comparing stock/bin cards to physical inventory, facilities stock/bin cards availability and accuracy and facilities that had complete and accuracy of LMIS report.

This assessment covered all family planning products available in the study area; it includes male and female condoms, IUCDs, jadelle, Depo-Provera, Combine oral pills (Microgynon), implanon, and minipills and Emergency pills. Lifesaving maternal commodities include in the study were oxytocin, misoprostol and magnesium sulfate (48).

4.8. Data quality management

The questionnaire was pre-tested in two HCMIS graduated health facilities (Felege hiwot referral hospital and Bahirdar health center) prior to actual data collection to ensure the validity of the survey tool and to standardize the questionnaire. Persons who held B.Pharm degree with having experience on pharmaceutical logistic system were recruited as data collectors and supervisors. Data collectors were trained and provided written interpretation for logistic variables. Questionnaire was checked by principal investigator for omissions and incomplete answers. Supervisor & the principal investigator made frequent checks on the data collection process to ensure the completeness & consistency of the gathered information.

4.9. Data analysis and interpretation

The collected data were critically checked for its completeness, and then coded, edited, entered, and cleaned using Statistical Package for the Social Sciences (SPSS) version 20 for windows. Descriptive statistics were computed and result was presented using tables and graphs using mean and frequency. The association between selected categorical variables examined using chi-square test at $P < 0.05$ statically significant level.

4.10. Ethical consideration

Ethical clearance and approval of the study was obtained from Institutional ethical Review Board of Jimma University, College of Public Health and Medical Science before starting the actual data collection. Subsequent permission was granted from the Amhara regional health bureau, each two zonal health department, woreda health office and the assessed health facilities. Participants (store manager and pharmacy coordinator) were informed about their participation is voluntary bases & a verbal consent was secured.

4.11. Dissemination plan

The results of the study will be submitted to the Department of Pharmacy, College of Public Health and Medical Sciences (Jimma University), Amhara Regional Health Bureau, partners (NGO), two zonal health departments, and woreda health offices and to all assessed health facilities. The result will be presented during thesis defense, as a partial fulfillment of Master degree in pharmaceutical supply chain management. Finally, attempts will be made to present the results on scientific conferences and to publish the research work on local as well as international journals.

5. Results

5.1. Background characteristics of participants and facilities

Twenty-one health facilities are involved in family planning and maternal health products logistic system. Likewise, logistic management information system of FP and maternal products were investigated in this study. To this end, 4(19%) hospitals and 17(81%) health centers were taken as study sizes. Moreover, a total of 21(50%) pharmacy coordinators and 21(50%) store managers were interviewed.

Table 1: Characteristics of study participants involved in the assessment of LMIS of family planning and maternal health products in North and South Gondar Zones, March 2015

Variable	Frequency (n)	Percentage (%)
Facility types		
Hospitals	4	19
Health centers	17	81
Total	**21**	**100**
Position of person Interviewed		
Pharmacy coordinators	21	50
Store managers	21	50
Total	**42**	**100**
Service years		
Less than 2 years	16	38
3-5 years	15	35.8
More than 5 years	11	26.2
Total	**42**	**100**

5.2. Organizational Structure Description and responsible person for managing of FP and maternal products in the study area

Pharmaceutical fund and supply agency (PFSA) is the source of family planning and lifesaving maternal health products to all public hospitals and health centers. Family planning products logistic system is an integrated system with other health program commodities like ART drugs, malaria and TB drugs. PFSA distribute all family planning products to hospitals and health centers according to their LMIS report by its vehicle every two months.

Occasionally non-governmental originations (NGOs) supply family planning and maternal health products directly to health centers and hospitals by push system (allocation methods).

Family planning and maternal health product flows from central PFSA to PFSA hubs and then to hospitals and health centers nationally. All public health facilities send RRF report to PFSA every two months. Moreover, every hospital and health center send a copy of RRF reports every two months to regional health bureau and woreda health offices respectively. All RRF reports contained three essentials logistic data; stock on hand, quantity issued/consumption/, and losses and adjustment. Standard stock keeping and reporting formats were distributed in all assessed health facilities. National, PFSA is responsible for the procurement, storage, and distribution of family planning and maternal health products.

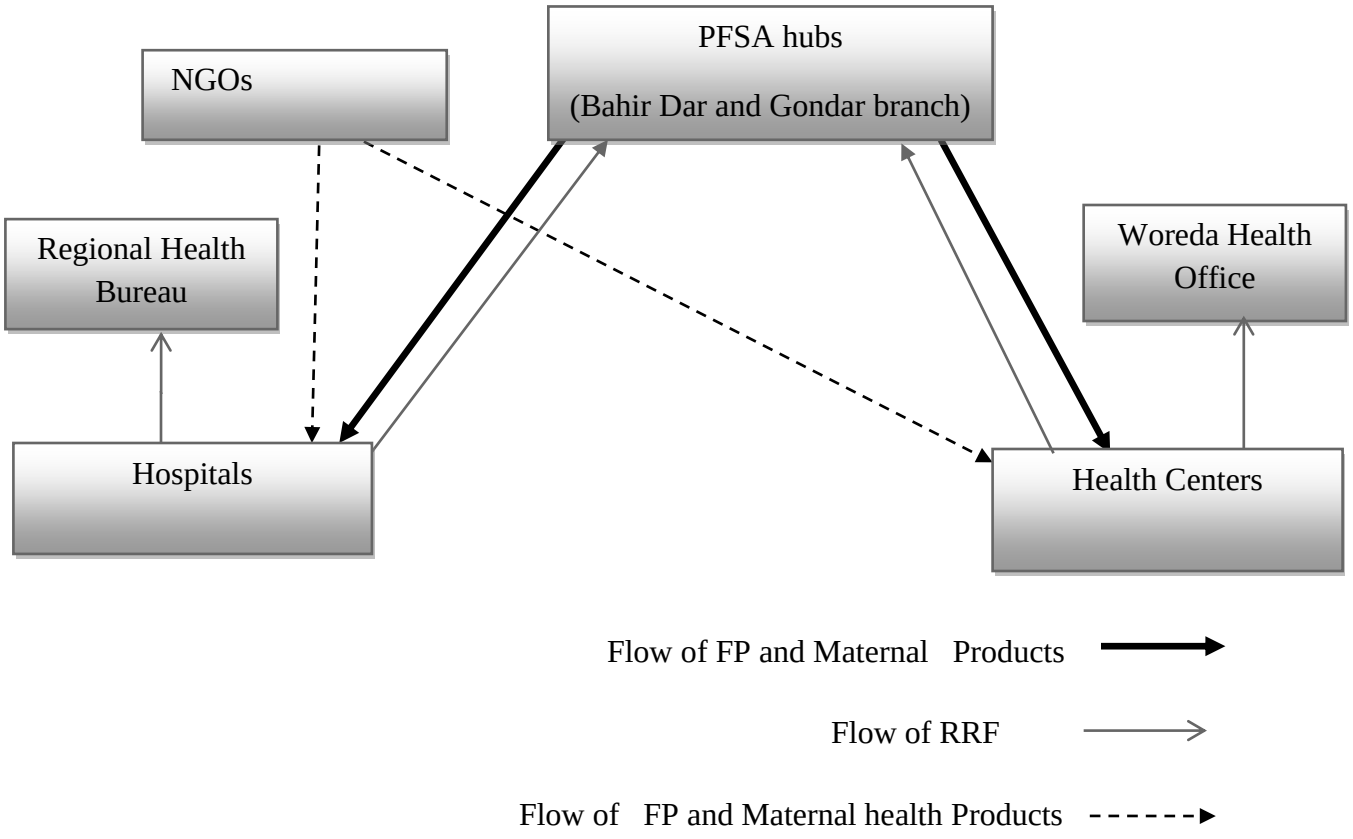


Figure 3: Illustrates the flow of reproductive health products and information system in North and South Gondar Zones, March 2015

The principal persons responsible for managing family planning and maternal health products were pharmacy professionals in all visited health facilities. From the total of 21 facilities visited in the pharmacy store, 4(19%) were pharmacists and 17(81%) were pharmacy technicians (diploma).

5.3 Training in logistic management

From a total of 42 pharmacy professionals involved in family planning and maternal health products logistic management, 36(85.7%) pharmacy professionals were trained in logistic management information system. Pharmacy professionals were trained to complete logistic forms and reports through on-the-job training in hospitals 4(50%) and health centers 16 (47) by supervisors. IPLS training has significant association with bin/stock card accuracy for all assessed products.

Table 2: Training of pharmacy professionals on LMIS by facility type in north and south Gondar zones, March 2015

health facility type	No pharmacy professionals	Training on IPLS	type of learning to complete the form/record by facility		
			during logistic work shop	On job training/ by supervisors/	on the job /self-learning/
Hospitals	8	6(75.0%)	4(50 %)	4(50.0%)	0
health centers	34	30(88.2%)	12(35.3%)	16(47.1%)	6(17.6%)
Total	42	36(85.7%)	16(38.1%)	20(47.6%)	6(14.3%)

5.4 Stock availability by product type on the day of visit

5.4.1 Availability of FP and maternal health products

5.4.1.1 Facilities that had stock level within the minimum-maximum stock levels

Six (35.3%) of the health centers had stock levels within the established maximum-minimum stock level for Depo-Provera. Five (29.4%) of the health centers had stock levels within the min-max stock levels for microgynon, implanon and emergency pills. Two (50.0%) of the hospitals had stock levels within the established minimum-maximum (min-max) stock levels for microgynon, oxytocin and male condom on the day of visit.

5.4.1.2 Facilities that had stock level greater than the maximum stock levels

Twelve (80%) of health centers had higher stock levels for jadelle. Eleven (64.7%) of the health centers had higher stock levels for oxytocin, microgynon and implanon. Ten (58.8%) of the health centers had higher stock levels for male condom and emergency pills. Four (100%) of the hospitals had higher stock levels for emergency pills, minipills, Jadelle and misoprostol on the day of visit.

5.4.1.3 Facilities that had stock level less than the minimum stock levels

Minimum stock levels includes all family planning and maternal products that either stock out (zero stock) or below two months of stocks. Eight (42.9%), 6(37.5%) and 5 (29.4%) of the health centers had stock levels less than the minimum stock levels for magnesium sulfate, mini pills and Depo-Provera respectively on the day of visit. One hospital had stock levels less than the minimum stock levels for Magnesium sulfate, IUCD and implanon.

Table 3: facilities stock availability on the day of visit by product types in North and South Gondar zones, March 2015

FP and maternal Products	Health Facilities Type	Facilities with less than the minimum stock level n (%)	Facilities within the maximum and minimum stock level n (%)	Facilities with more than the maximum stock level n (%)	Total Health Facilities
Oxytocin	Hospital	0	2(50.0%)	2(50.0%)	4(100%)
	Health center	2(11.8%)	4(23.5%)	11(64.7%)	17(100%)
Magnesium	Hospital	1(25.0%)	1(25.0%)	2(50.0%)	4(100%)
sulfate	Health center	8(42.9%)	2(12.5%)	7(43.8%)	17(100%)
Misoprostol	Hospital	0	0	4(100.0%)	4(100%)
	Health center	4(25%)	5(33.3%)	7(46.7%)	16(94.1%)
Microgynon	Hospital	0	2(50.0%)	2(50.0%)	4(100%)
	Health center	1(5.9%)	5(29.4%)	11(64.7%)	17(100%)
Depo-	Hospital	0	1(25.0%)	3(75.0%)	4(100%)
Provera	Health center	5(29.4%)	6(35.3%)	6(35.3%)	17(100%)
IUCD	Hospital	1(25%)	0	3(75.0%)	4(100%)
	Health center	2(12.5%)	5(31.2%)	9(56.2%)	16(94.1%)
Jadelle	Hospital	0	0	4(100.0%)	4(100%)
	Health center	2(14.3%)	0	12(80.0%)	14(82.4%)
Implanon	Hospital	1(25.0%)	1(25.0%)	2(50.0%)	4(100%)
	Health center	1(5.9%)	5(29.4%)	11(64.7%)	17(100%)
Male	Hospital	0	2(50.0%)	2(50.0%)	4(100%)
condom	Health center	4(23.5%)	3(17.6%)	10(58.8%)	17(100%)
Minipills	Hospital	0	0	4(100%)	4(100%)
	Health center	6(37.5%)	2(12.5%)	8(50%)	16(94.1%)
Emergency	Hospital	0	0	4(100%)	4(100%)
pills	Health center	2(11.8%)	5(29.4%)	10(58.8%)	17(100%)

N.B. Female condom was not found in any of the study facilities at the time visit and in the past six months

5.4.2 Stock outs

5.4.2.1 Stock outs during the last 6 months

Seventeen (81%) of facilities reported that they usually run out of stock at least for one family planning and maternal health products before resupply. The highest stock out of family planning and maternal health products were magnesium sulfate, misoprostol, IUCD and mini pills with stock out rate 10(47.6%), 6(28.6%), 4(19%) and 4(19%) respectively. An average 13 percent of health facilities were stock out for FP and maternal health products in the last six months.

5.4.2.2 Duration and average number of stock outs in the past six months

From the facilities that had stock /bin cards the average duration of stock outs in days was found to be highest for jadelle (100 days), IUCD (90 days), magnesium sulfate (70 days) and misoprostol (64 days). Magnesium sulfate was the highest average number of stock outs 1.2 times (1-3 times) in the past six months (table 4).

5.4.2.3 Stock outs at the time of visit

Twelve (57.1%) of health facilities stocked outs at least for one family planning and maternal health products at the time of visit. The highest stock out rate was for magnesium sulfate 7(33.3%) followed by misoprostol 4(19%) and IUCD 3(14.3%). Eight percent of health facilities stocked out for FP and maternal health products at the time of visit. Whereas 14(66.3%), 17(81%), 19(90.5%) and 18 (85.7%) of health facilities had in stock for Magnesium sulfate, misoprostol, jadelle and IUCD respectively at the time of visit.

Table 4: stock out products on the day of visit, stock out during the last 6 months, average duration of stock outs and mean number of stock outs in the last 6 months(September,2014-Feburary, 2015)in South and North Gondar Zone health facilities, march 2015

FP and maternal Products	Facilities stock out any time in the last six months % (n)	Facilities stock out the day of visit	Mean number of days (range) of stock outs in the last 6 months	Mean number of times of stock outs in the last 6 Months
Oxytocin	1(4.8%)	0(0%)	13	1.0
Magnesium sulfate	10(47.6%)	7(33.3%)	69.9(30-160)	1.2(1-3)
Misoprostol	6(28.6%)	4(19%)	64(15-90)	1.0
Depo-Provera	1(4.8%)	0(0%)	10	1.0
IUCD	4(19%)	3(14.3%)	90(30-180)	1.0
Jadelle	3(14.3%)	2(9.5%)	100(30-180)	1.0
Male condom	1(4.8%)	0(0%)	60	1.0
Mini pills	4(19%)	3(14.3%)	62.5(10-180)	1.0
Emergency pills	1(4.8%)	0(0%)	60	1.0
Total	**13.4%**	**8.2%**		

5.4.3 Reasons for stock outs

More than half of the health facilities (52.4%) claimed that higher level facility did not send enough products was the main reasons for stock out.

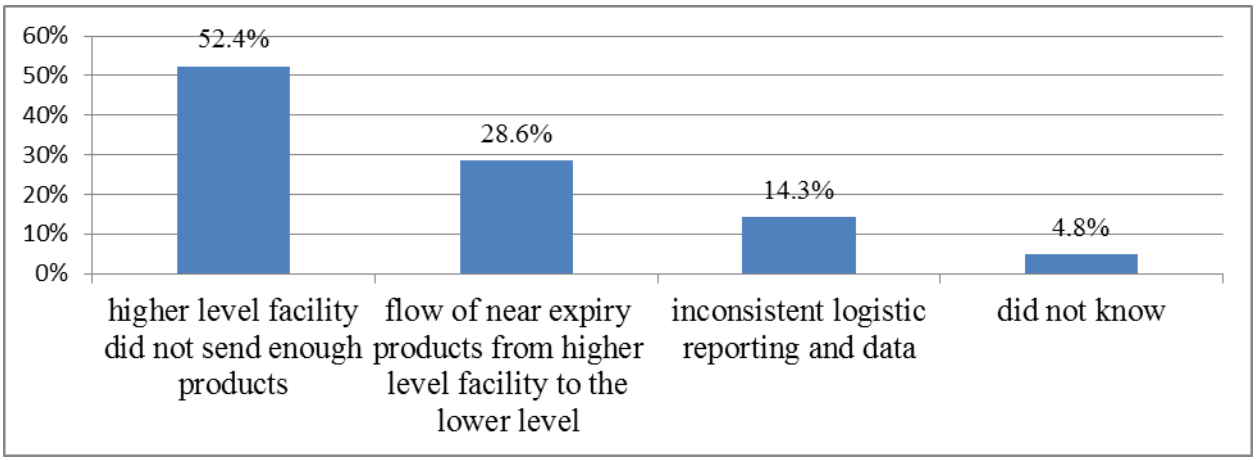


Figure 4: Facilities reasons for stock outs, March 2015

5.4.4 Actions Taken during stock outs

In this study, 12(57.1%) of the health facilities managed Stock outs by going to higher level facilities for re-supply and 9(42.9%) health facilities managed by borrowing family planning products from other peer health facilities.

5.4.5 Overstock products

Eleven (52.4%) of the health facilities reported to have overstock of some family planning products before resupply. The common products with overstocking are; emergency pills, implanon, jadelle and IUCD. Ten(47.6%) and 11(52.4%) of health facilities managed overstock products by transferring to other health facilities and stored for future use respectively. one health facility returned overstock products to their respective suppliers.

5.4.6 Expired family planning and maternal health products

Expired family planning and maternal health products were found in 8(38%) of the facilities. Four (25%), 3(14.3%), 2(9.5%) of the facilities had expired stock for misoprostol, microgynon, and emergency pills respectively on the day of the assessment and their expiry quantities were 650 tablet, 370 cycle and 334 tablet respectively.

Nine (42.9%), 10(47.6%) and 2(9.5%) of health facilities responded the reasons for expiry of products, overstock of the items, received nearly expiry(less than one year) products from PFSA and donation of nearly expiry products from donors respectively for FP and maternal health products.

5.5 Report and request of FP and maternal health products

All health centers and hospitals submitted their stock information report to their next higher levels using report and requisition forms (RRF) during the last month. Eight (38.1%) of health facilities had sent their RRF report to higher levels using their staff by their resources and other peoples traveling in the area. Four (19%) and 1(4.8%) of facilities had sent by supervisors and fax machine respectively.

Thirteen (69%) of the health facilities reported take two to four weeks between ordering and receiving family planning and maternal products from PFSA. Six (28.6%) of the facilities

reported take one month to two months, and 2(9.5%) of the facilities reported take less than one week.

5.5.1 Order fill rate

As it is illustrated in table 5 below, the result showed that health facilities ordered family planning and maternal products during the last reporting period by using report and request form (RRF). Health facilities received the quantity ordered either less or higher than their order or equal to their order quantity. Six (75%) and 4(80%) of the health facilities received less quantity of products ordered for magnesium sulfate and misoprostol respectively in the last report. An average of 50.4% of health facilities received equal to the quantity ordered products in the last report.

Table5: facilities ordered and received quantities of products (in their last ordered that they received) in North and South Gondar Zones, March 2015

FP and maternal Products	No facilities that ordered the products	% of facilities that received lesser quantity of products Ordered n (%)	% of facilities that received quantity of products Ordered n (%)	% of facilities that received more quantity of products ordered n (%)
Oxytocin	8	3 (37.5)	5(62.5)	0
Magnesium sulfate	8	6(75)	2(25)	0
Misoprostol	5	4(80)	1(20)	0
Microgynon	10	5(50)	5 (50)	0
IUCD	6	1(16.7)	5(83.3)	0
Depo-Provera	14	4 (28.6)	4(28.6)	6(42.9)
Implanon	7	2(28.6)	5(71.4)	0
Male condom	7	2(28.6)	4(57.1)	1(14.3)
Mini pills	8	3(37.5)	4(50	1(12.5)
Emergency pills	9	1(11.1)	7(77.8)	1(11.1)
Jadelle	7	5 (71.4)	2 (28.6)	0
Total		**42.2**	**50.4**	**7.3**

5.6 Logistics Management Information System (LMIS)

5.6.1 Utilization of LMIS forms to manage FP and maternal products

All hospitals were using all LMIS forms (records and reports) except stock cards and electronic generated RRF for managing family planning and maternal health products. Four (23.5%) of health centers were using stock cards and daily register for managing family planning and maternal health products. All health centers were using bin cards, report and requisition forms (RRF), internal facility report and resupply form (IFRR) and Governmental receiving and issuing voucher (model 19 and 22). All logistic forms contained three essential logistic data; stock on hand, quantity used/issued and loss and adjustment except daily register, model 19 and 22(table 6).

Table 6: Utilization of logistic forms by facility Type in north and south Gondar zones, March 2015

Type of facility	using stock card n(%)	using daily register n(%)	using bin card n(%)	Using IFRR n (%)	using RRF n(%)	receiving Model (19) n (%)	Using generated RRF n(%)	Issuing model (22) n(%)
Hospital	2(50)	4(100)	4(100)	4(100)	4(100)	4(100%)	3(75)	4(100)
Health center	4(23.5)	4(23.5)	17(100)	17(100)	17(100)	17(100)	12(70.6)	17(100)
Total	**6(28.6)**	**8(38)**	**21(100)**	**21(100)**	**21(100)**	**21(100)**	**15(71.4)**	**21(100)**

5.6.2 Stock/bin card availability and updated for FP and maternal products

Around 99 percent of the health facilities had available stock/bin cards for managing FP and maternal products. All hospitals (100%) and 98.4% of the health centers were using bin/ stock cards for all family planning and maternal health products. All hospitals and 78.7% of the health centers had updated bin/stock cards for all family planning and maternal health products before a month prior to the survey. Eighty three percent of the health facilities stock/bin cards were updated for family planning and maternal products. Twenty (95.2%) of health facilities had updated bin/stock cards for Oxytocin, Microgynon and depo Provera a month prior to the survey (table 7).

Table 7: Bin card availability and updated by product and facility types in south and north Gondar zones, March 2015

	Bin cards available			Bin cards updated		
FP and maternal Products	Hospital n(%)	Health center n(%)	Total	Hospital n(%)	Health center n(%)	Total
Oxytocin	4(100%)	17(100%)	21(100%)	4(100%)	16(94.1%)	20(95.2%)
magnesium sulfate	4(100%)	17(100%)	21(100%)	4(100%)	13(76.5%)	17(81%)
Misoprostol	4(100%)	16(94.1%)	20(95.2%)	4(100%)	12(75%)	16(80%)
Microgynon	4(100%)	17(100%)	21(100%)	4(100%)	16(94.1%)	20(95.2%)
depo provera	4(100%)	17(100%)	21(100%)	4(100%)	16(94.1%)	20(95.2%)
IUCD	4(100%)	17(100%)	21(100%)	4(100%)	12(70.6%)	16(76.2%)
Jadlle	4(100%)	15(88.2)	19(90.5)	4(100%)	11(73.3%)	15(78.9%)
Implanonn	4(100%)	17(100%)	21(100%)	4(100%)	11(64.7%)	15(71.4%)
Male condom	4(100%)	17(100%)	21(100%)	4(100%)	12(70.6%)	16(76.2%)
Minipills	4(100%)	17(100%)	21(100%)	4(100%)	14(82.4%)	18(85.7%)
Emergency pills	4(100%)	17(100%)	21(100%)	4(100%)	12(70.6%)	16(76.2%)
Total	**100%**	**98.4%**	**98.7%**	**100%**	**78.7%**	**82.8%**

5.6.3 Stock/bin card Information accuracy with physical count at the time of visit

Fifty five percent of health facilities had accurate bin/stock card balances for family planning and maternal products. In all hospital stores, there were no discrepancies between stock/bin card balances and the physical inventory count for oxytocin, microgynon, implanon and mini pills at the time of visit. An average 79.5% of hospitals and 49.8% of the health centers had accurate stock/bin card balances for family planning and maternal products (table 8).

Table 8: accuracy of bin /stock card balances by product and facility types in South and North Gondar Zones, March 2015

PF and maternal products	Hospitals n (%)	Health centers n (%)	Total
Oxytocin	4(100%)	7(41.2%)	11(52.4%)
magnesium sulfate	2(50%)	11(64.7%)	13(61.9%)
Misoprostol	2(50%)	10(62.5%)	12(60%)
Microgynon	4(100%)	6(35.3%)	10(47.6%)
depo provera	3(75%)	8(47.1%)	11(52.4%)
IUCD	3(75%)	7(41.2%)	10(47.6%)
Jadlle	3(75%)	11(73.3%)	14(73.7%)
Implanonn	4(100%)	9(52.9%)	13(61.9%)
Male condom	3(75%)	5(29.4%)	8(38.1%)
Minipills	4(100%)	8(47.1%)	12(57.1%)
Emergency pills	3(75%)	9(52.9%)	12(57.1%)
Total	**79.5%**	**49.%**	**55.4%**

N.B If no discrepancy stock on hand between the bin card and the physical count, then it is considered as accurate

5.6.4 RRF report accuracy with balance on stock/bin card in the last reported RRF

All hospitals and 15(88.2%) of the health centers sent completed RRF reports to higher levels in the last reporting period for all family planning and maternal products. Fifty nine percent of the health facilities sent complete and accurate RRF reports to higher levels in the last reporting period. Fourteen (73.7%), 13 (61.9%), 12 (57.1%) and 10 (55.6%) of the health facilities sent complete and accurate RRF reports to higher levels for jadelle, IUCDs, implanon and misoprostol respectively in the last reporting period(table 9).

Table 9: Accuracy of LMIS reports with bin /stock card balances at reporting time by product and facility types in North and South Gondar Zones, March 2015

FP and Maternal products	Number of facilities sent RRF report in last reporting time		% of facilities that had accurate LMIS report in the last reporting time		Total facilities that had accurate RRF
	Hospital	H center	Hospital n(%)	H center n(%)	
Microgynon	4	17	2(50%)	7 (41.2%)	9 (42.9%)*
depo provera	4	17	3(75 %%)	6 (35.3%)	9(42.9%)*
IUCD	4	17	3(75%)	10(58.8%)	13 (61.9%)
Jadlle	4	17	4(100%)	10 (66.7%)	14 (73.7%)
Implanonn	4	17	3(75%)	9 (52.9%)	12 (57.1%)
Male condom	4	17	4(100%)	5 (29.4%)	9 (42.9%)*
Minipills	4	17	3(75%)	9 (52.9%)	12 (57.1%)
Emergency pills	4	17	2(50%)	9 (52.9%)	11 (52.4%)*
Oxytocin	0	8	0(0%)	5(62.5%)	5 (62.5%)
magnesium sulfate	4	10	3(75%)	6 (60%)	9 (64.3%)
Misoprostol	4	15	2(50%)	8 (53.3)*	10 (52.6%)
Total	**4**	**17**	**65.9%**	**51.5%**	**55.5%**

N.B Accuracy was defined as the matching balance of stock on hand in the reported RRF with the balance on the bin/stock card in the last reporting period.

5.7 Inventory control for family planning and maternal health products

Health facilities were using forced ordering maximum- minimum inventory control system, at the end of every other month each facility send stock status report to higher level (PFSA) for family planning and maternal health products. Inventory control procedure was established for all family planning and maternal health products.

Thus, this study showed that all hospitals 4 (100%) and 16(88.2%) of the health centers store managers knew maximum/minimum stock level and emergency order point, which were well elaborated and established as 4, 2 and 0.5 months for maximum, minimum and emergency order

points respectively. All the health facilities conducted at least one annual physical inventory for all family planning and maternal health products.

5.8.1 Number of emergency orders

Twelve (57.2%) of the health facilities didn't place emergency order while the rest 9(42.9%) of the health facilities placed emergency order for family planning and maternal health products ranging from one to two times in the past six months.

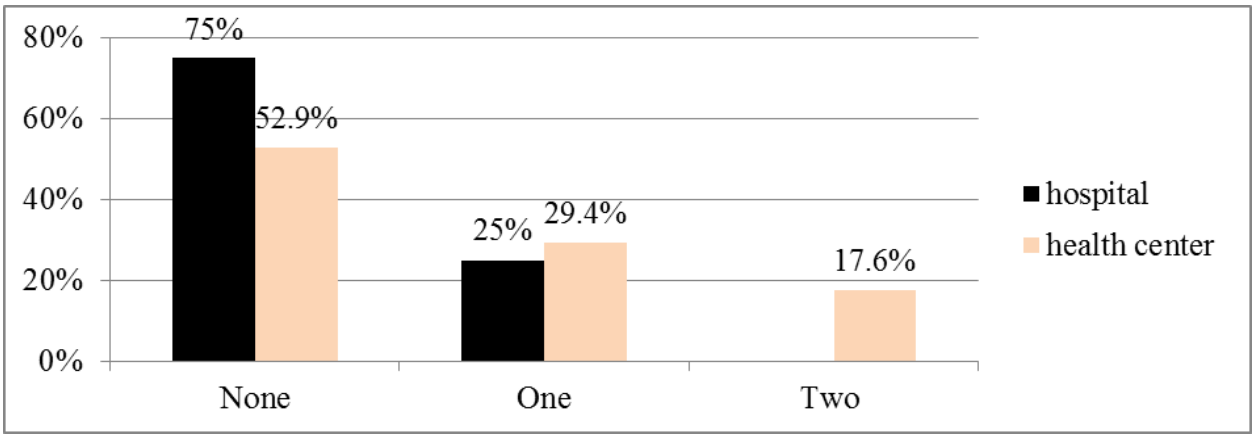


Figure 5: Numbers of emergency order in the last six months by facility type in North and South Gondar Zones, March 2015

5.8 Supervision

From 21 heath facilities, 18(85.7%) of them had received a supervision on family planning and maternal product logistic management in the past three months. Among these, 6(28.6%) of the health facilities had received a supervision in the last month and 12(57.1%) of facilities received supervision in the last three months. However, three (14.3%) of the health facilities hadn't received a supervision on FP and maternal products logistic system in the last six months.

Among 18 facilities, 11(61.1%) of health facilities supervised by partners (NGOs) and 6(35.3%) of health facilities supervised by PFSA. The remaining one health facility was supervised by woreda health office in the past three months. None of the health facilities received supportive supervision from ZHD and RHB in the past six months. Supervision has significant association with bin/stock cards accuracy for assessed products, but service year has not significant association with bin/stock cards accuracy.

Eighty three percent of the health facilities were supervised using checklist, but thirteen (72.2%) of the health facilities reported that the supervision visits were not scheduled. Only five (35.7%) health centers supervision visits were scheduled. Fifty five percent of the health facilities received feedback on supervision findings. The rest 8(44.4%) of the health facilities did not receive feedback.

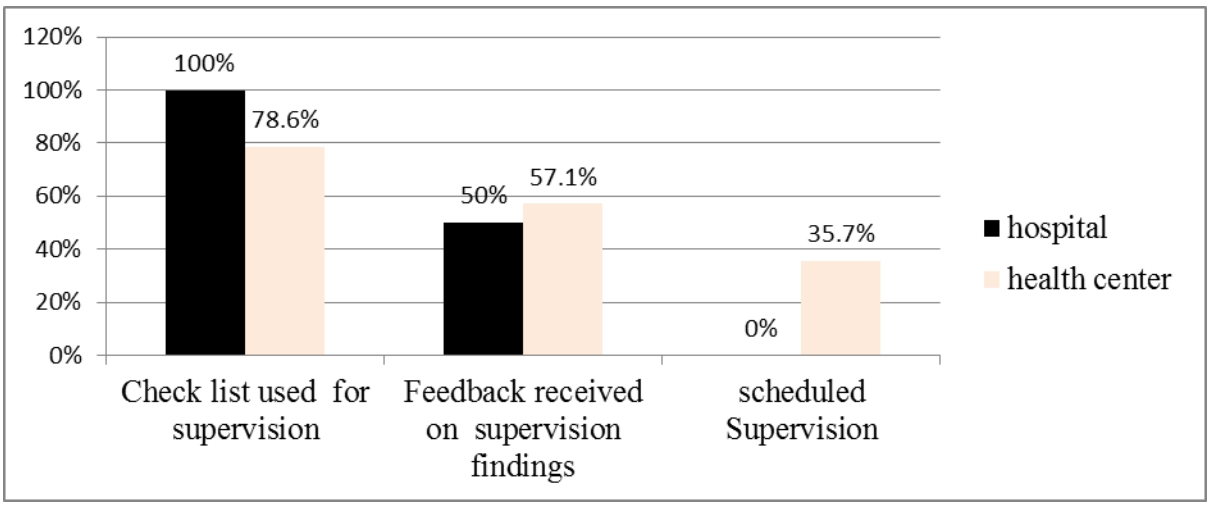


Figure 6: supportive supervision activities in the last supervision in North and South Gondar Zones by facility type, March 2015

Table10: Association between category variables using chi square tests

Variable	Accurate bin cards for all products		
		Total N	P value
Supervision	Yes	18	0.041
	No	3	
Health facility type	Overstock before resupply		0.035
	Hospital	4	
	H center	17	
Training on IPLS	Accurate bin cards for all products		0.041
	Yes	18	
	No	3	

6. Discussion

In Ethiopia, studies and information on reproductive health products logistic management information system is very rare, and this study will help policy makers and program coordinators to improve the design and operation of LMIS and also product availability in the study area.

Regarding LMIS training, the finding this study showed that 36 (85.7%) pharmacy professions were trained in logistic management information system which was in agreement with study done in Nigeria(34) showed that Eighty-four percent of health professional had received LMIS training.

Ensuring the availability of reproductive health products in health service delivery points is crucial in the provision of quality of health care and reducing maternal mortality and also achieving MDG 5. The finding from this study showed that 66.3%, 81%, 100%, 100% and 100% of the health facilities had stock for Magnesium sulfate, misoprostol, oxytocin, male condom and Depo-Provera respectively which was greater than a study done in Ethiopia (42). The reason could be due to the fact that the assessed facilities include health posts and health centers which are far from the supplier (long pipeline) and facilities did not request right quantity at the right time.

According to the integrated pharmaceutical logistic system guideline (SOP), program pharmaceuticals are single reporting and distribution system based on the overall mandate of the PFSA, that means family planning and maternal products are ordered every two months by hospitals and health centers and delivered by PFSA, but in the present study, it was found that family planning and maternal products distribute by NGOs (partners) directly to hospitals and health centers.

Concerning the products availability at the time of visit, 2(50.0%), 4(100.0%) and 4(100%) of hospitals had more than the maximum stock level for microgynon, jadelle and emergency pills respectively. In contrast a study done in Kenya (33) showed that all hospitals had within minimum and maximum stock levels for microgynon, jadelle and emergency pills. The reason might be, in this study, majority of facilities did not request based on their consumption

quantities (poor max-min inventory control management practice) and sometimes developing countries partners (NGO) supplied family planning and maternal health products directly to health facilities by pushing (allocation) system.

Seven (33.3%) of the health facilities stocked out for magnesium sulfate on the day of visit, which was lower than studies in other parts of Ethiopia (80%) (61.1%) and Bangladesh (60%) (24,43,29). The reason might be due to the fact that facilities send their LMIS reports to higher levels on time and similarly higher levels distribute FP and maternal health products directly to health facilities by its own vehicles (short pipeline).

Concerning stock out at the time of visits, in the present study, it was found that 3(14.3%), 2(9.5%) and 3(14.3%) of health facilities were stock out for IUCD, jadelle and minipills respectively on the day of visit, which was lower than a study done in Zambia (38) revealed that more than 60% of health facilities were stock out for IUCD, Jadelle and minipills. The difference might be due to facilities send relatively accurate RRF reports to higher levels and facilities well supervised by higher levels.

Twelve (57.1%) of the health facilities were stock out at least one family planning and maternal health products at the time of visit. A study done in Nigeria (35) showed 30 % of health facilities stocked out at least one product, which was much lower than in the present study. The reason might be due to in the present study, number of facilities not received according to amount of quantity ordered products (less accurate order fill rate).

Emergency order can be an indicator of poor inventory control practices. In this study, it was found that 43% of the health facilities placed emergency order in the last six months, which was higher than a study done in Nigeria (25%) (35). This could be due to the fact that logistic personnel did not request right quantity according to the min-max inventory control system and PFSA not supplied adequate quantity of products(low accuracy of order fill rate).

Concerning expired products, the present study showed that 1(4.8%) of health facilities had expired stock for male condom on the day of the assessment, which was higher than in Ghana

study 9(1%) (40). This might be due to the fact that facilities received near expiry products from higher levels.

Regarding order fill rate, in this study, it was found that fifty percent of health facilities order fill rate was accurate (received equal quantity of ordered products), which was lower than a study done in Nigeria (75%) (35). The reason might be due to the fact that suppliers (PFSA) had not sufficient quantity of products supply to health facilities and Sometimes higher levels rounding off order quantities due to pack size.

Availability and updated Stock/ bin card is essential indicator of logistics information system and inventory management because all aspects of the logistics information system depend on well-kept records. In this study, it was found that 98.7% of health facilities had available stock/bin cards for all assessed products, which was higher than others studies done in Addis Ababa (13.79%) and Nigeria (80.1%) (39,34). The reason could be due to the fact that bin/ stock cards were distributed adequately in all health facilities and majority of them supervised by higher levels.

The findings of this study revealed that seventy eight percent of the health centers had updated bin/stock cards for family planning and maternal health products a month prior to the survey which was greater than others studies done in Ghana (35%) and Philippines (23%) (40,29). The difference might be due to the fact that facilities had received supervision from higher levels and majority of the professionals were trained in logistic management information system how to fill and complete logistic forms.

The present study revealed that all hospitals and 94.1% of the health centers had updated bin/stock cards for Depo-Provera and oxytocin within the previous 30 days which was much higher than a study done in Ethiopia (44). This could be due to the fact that facilities were well supervised, HCMIS tool helps to timely update bin/stock cards and reduced the time required for calculations and majority pharmacy professions were trained on IPLS.

LMIS data accuracy is crucial to quality logistics system and product availability, and this begins with the stock/bin card accuracy. In this study, it was found that fifty five percent of health facilities had accurate stock/bin card balances for family planning and maternal health products. In contrast a study done in Nigeria (34) showed that 57% of health facilities had accurate stock cards. The difference might be due to the fact that majority of supportive supervision visits were not schedule (PFSA & partners) and facilities were not supervised by RHB and ZHD.

Regarding the accuracy of bin/stock cards also, in this study, it was found that 79.5% of hospitals and 49.8% of the health centers had accurate bin /stock card balances for family planning and maternal health products. Similar study conducted in Kenya (33) revealed, 30% of the hospitals and 48.6% of the health centers had accurate stock/bin card balances for managing products; the present study findings were in agreement with the Kenya study in case of health centers and higher than in case of hospitals. The discrepancy could be in this study facilities were well supervised and majority of pharmacy professionals were trained in logistic management information system.

Logistic data must be aggregated and reported to higher levels; the information sent on those reports should be complete and accurate for effective logistics decision-making and to ensure the consistency of reproductive health products availability at facility levels. This study revealed that all health facilities sent RRF report within the last month to higher level for family planning and maternal products. A study in Addis Ababa (39) showed that 56(96.55%) of the SDPs sent their LMIS reports within the last month to the next higher levels. The difference might be due to in the present study facilities were implementing integrated pharmaceutical logistic system (one report one distribution system) and standard reporting formats were distributed in all assessed health facilities that improve the reporting rate.

Fifty nine percent of the health facilities sent complete and accurate RRF report to higher level in the last reporting period which was higher than others studies done in Nigeria (42%) and Ethiopia (46%) (35,44). The probable reason might be facilities were well supervised by higher levels (partners & PFSA) and also HCMIS tool help to generate accurate RRF reports.

The maximum-minimum inventory control system enables staff at health facility stores to know when to order, how much to order, and how to maintain an appropriate stock level (between established minimum and maximum stock levels) to avoid shortages and oversupply. A study in Ghana, Zambia, Kenya and Nigeria (40, 36, 33 &35) showed that health facilities settled and used minimum /maximum stock levels for reproductive health products, but minimum-maximum month of stock vary from country to country. The present study showed, facilities were established and using maximum-minimum stock levels and existed in the national standard operating procedures manual for the integrated pharmaceuticals logistics system (IPLS), but store managers were not properly practicing the min-max system. Majority of the health facilities had more than the maximum stock level for majority FP and maternal products.

Supervision helps to improve individual and system performance and can alert managers to potential problems such as stock outs, under stocks and overstocks, and products near their expiry dates. The present study showed that all hospitals and 14(76.5%) of the health centers had received supervision visits including FP and maternal products logistic system in the past three months. A study in Tanzania (18) showed that twelve (100%) hospitals and 69(98.6%) of health centers had received supervision visits from higher levels, which were in line with this finding in case of hospitals and higher than this finding in case of health centers. The difference might be due to in the present study facilities supervised by partners and PFSA only; however, RHB and ZHD were not properly support health facilities logistic system.

7. Strengths and limitations of the study

Strengths

- ✓ The study has provided baseline information for interventions aiming to identify the gaps and improve the logistic management information system of family planning and maternal health products

Limitations

- ✓ Limited number of similar studies in the area of LMIS practice made this study to face shortage of local results for comparison.
- ✓ The study was done only in HCMIS implementing health facilities where recordkeeping and report data are relatively available and good documentation

8. Conclusion

Despite well-designed logistics system for family planning and maternal health products, partners (NGOs) supply family planning and maternal products that impact on the reporting and inventory management system in the study site. Responsible persons for managing products in all health facilities were pharmacy profession, and majority of the pharmacy professionals were trained in LMIS (IPLS), but significant number of facilities was stock out of magnesium sulfate at the time of visit and in the past six months due to inadequate supply of the products and report data quality problem. Many of the health facilities had not accurate stock/bin card balance.

Health facilities had stock on had (usable stock) higher than the maximum stock levels. Overstocks, under stocks, emergency order and stock outs were found in health facilities due to poor implementation of LMIS and store managers do not follow the established min-max inventory control procedure. Many of the health facilities stored overstock products for future use because there is no design system to redistribute overstock products from health facilities to health facilities and PFSA.

Majority of the health facilities were supervised using checklist by PFSA and partners (NGO), but the supervision visits were not scheduled in majority of the health facilities, and they do not used standard check list and weak feedback.

9. Recommendation

- ✓ Developing countries partners (NOGs) should not supply family planning and maternal health products directly to health facilities that affect the reporting and inventory management system in health facilities.
- ✓ Supervision should be scheduled and collaborated with different responsible organization including RHB, ZHD, Woreda health office and PFSA hubs for logistic management.
- ✓ There were some facilities observed to have mini pills, jadelle and IUCDs more than one year consumption while others health facilities are out of stock for some months. To avoid this problem, PFSA hubs, RHB, ZHD and woreda health office should design effective mechanisms to redistribute overstock products from facilities that have large quantities to those under stocked or out of stock.
- ✓ PFSA hubs, RHB and ZHD should design in a system to collect RRF reports from health facilities (assign logistics data collectors)
- ✓ Further detailed and large scale studies should be done to see the status of logistics management information system for family planning and lifesaving maternal health product.

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Annex 1: Lists of study facilities and HCMIS implementing health facilities in north and south Gondar zones

Zones	Hospitals	Health centers
North Gondar	Debark Hospital Gondar university specialized hospital Metema Hospital	Dabat Health Center Koladiba Health Center Amba Giorgis Health Center Maksegnit Health Center Aykel Health Center Tekil Dengay Health Center Sanja Health Center Arbaya Health Center Gondar Health Center Delgi Health Center *
South Gondar	Debretabor General Hospital	Wereta Health Center Addis Zemen Health Center Debre Tabor Health Center Arbi Gebya Health Center Ambasame Health Center Estie Health Center Nifas Mewucha Health Center Hamusit Health Center

Source :(ARHB and JSI deliver regional office, December 2014)

N.B * indicates inactive HCMIS facility

Annex 2: Information sheet

Title of research project: assessment of logistic management information system status for reproductive health products in HCMIS tool implementing public health facilities in north and south Gondar zones of northwest Ethiopia

Name of the principal Investigator: Ashagrie Abere

Name of Advisors: Seid Mussa (Bpharm, MSc, assistance professor),

Yared Yigezu (B.pharm, MPH)

Introduction

My name is Ashagrie Abere. I am a post graduate student of Jimma University, department of Pharmacy; going to conduct study and collect data on Logistics Management Information System of family planning and maternal health products and the overall family planning and maternal health products management status in HCMIS implementing health facilities in north and south Gondar zones.

Purpose of the research project : The aim of this study is to collect current information on logistic system and stock status of family planning and lifesaving maternal health products and provide information based on the findings of the study to the responsible bodies so as to give due attention about the problem.

Confidentiality: The information that you tell to the interviewer will not be given to others. After the study is done, the surveys will be locked.

Persons to contact: If you have any question you can contact the principal investigator at any time you want.

Ashagrie Abere: Jimma university Tel: +251910174296

E-mail: ashagrieabere@yahoo.com

Annex 3: Questionnaire

Assessment of Logistic management information system of reproductive health products

Questionnaire for health facilities survey

Interviewer's Guide

Introduction Use the text here to guide your introduction of the survey to facility staff.

Questions 01 to 7: Receive permission to conduct the interview and record information regarding the interviewee.

Questions101 to 133: Record responses clearly by circling either the number or letter that corresponds to the interviewee's response. Questions with letters may have multiple responses; questions with numbers have only a single response.

Data abstraction formats

Format 1: order fill rate (comparison quantity ordered to quantity received).

Record the quantity ordered and received from the Logistics Recording Form

Format 2: Stock Status

Record the maximum, minimum months of stocks and order interval. If the interviewee does not know these, mark DK as the response. To fill in the cells, follow the instructions above the table.

Format 3: Stock data quality tables.

Record each family planning and maternal health commodity available and compare the records with the actual counts

End Interview by Asking the interviewee/s if they want to ask you any questions records. Thank them for their time and cooperation.

Acronyms

DK--- don't known
IFRRF ----internal facility report and request form
RRF---report and request form
PFSA---pharmaceutical fund supply
WHO---woreda health office
LMIS ---Logistics Management Information System
NGO ---Non-Governmental Organization
FEFO--- First Expire First Out
RHB--- Regional Health Bureau
FMOH --- federal Ministry of Health
SDP--- Service Delivery Point
NA--- Not Applicable/Not Available
ZHD—zonal health department
EOP--- emergency order point

Name of the facility_____

Facility location
City/town: _____
Region_____
District _____

Facility type 1 = Hospital; 2=Health Center; 3=other (specify_____

Interviewer/s: _____ signature_____
Date of Interview_____
Checked by: supervisors name _____ signature _____

"Good day. My name is _____. I am collecting data on behalf of Ashagrie Abere who is conducting a survey regarding logistics management information system of family planning and maternal health products. I am conducting a survey of service delivery points to determine the availability of family planning and lifesaving maternal health products and general characteristics of the logistics management information system of family planning and maternal health products. Your facility was selected in the study. The assessment will provide information enabling the MOH and RHB to implement appropriate interventions to improve family planning and maternal commodities logistics system performance.

All of the information collected is strictly confidential. We will not refer to individual facilities in the report, but rather will describe the overall picture of all facilities. I would like to ask you a few questions about the family planning and lifesaving maternal health products logistic management information system. Whom are you going to proceed?

No	Introduction	Code classification	Go to
01	Can we continue?	Yes …… 1 No ……0	If no stop
02	Position of person interviewed for this section	Title ---------- ----------	
03	Number of years and months you have worked at this facility?	Years:_____ Months: _____	
04	Who is the principal person responsible for managing family planning products and maternal health medicine at this facility?	Pharmacist …….. 1 Pharmacy Technician……..2 Midwifery……3 nurse degree …….4 Druggist……5 Nurse diploma ……..6 Others (Specify) ----------	
05	Is supplies/stock management the primary role of this person at this facility?	Yes …… 1 No ……0	

Ask the following questions of someone in charge of managing/overseeing family planning and maternal medicines. After asking the questions in this section, visit the storeroom, or storage area where the family planning and lifesaving maternal health medicines listed are managed.

No	Questions	Code classification	Go to
I	**Questions On LMIS**		
101	What are the source of family planning and maternal products to your facility? *Circle all if they are applied in your facility*	PFSA----------A RHB----------B ZHD---------C district /Woreda/ health office----D Partners(NGO)----------E Others (specify) ----------	
102	Do you use and fill out the following logistics forms to manage family planning and maternal products?		
A	Electronic stock cards (generated RRF)	Yes----------1 No----------0	

B	stock cards	Yes----------1 No----------0	
C	daily registers	Yes----------1 No----------0	
D	bin cards	Yes----------1 No----------0	
E	reporting and requisition forms(RRF) or carbon copy	Yes----------1 No----------0	
103	What forms do you use for reporting/ordering family planning and maternal heath commodities?		
A	Government receiving note (Model 19)	Yes----------1 No----------0	
C	Government approval note (Model 21)	Yes----------1 No----------0	
D	Government distributed note (Model 22	Yes----------1 No----------0	
E	Internal Facility Report and Resupply form (IFRR)	Yes----------1 No----------0	
F	Combined facility report and resupply form(RRF)	Yes----------1 No----------0	
104	Do reports complete of family planning and lifesaving maternal health commodities include the following?		
	A. Stock on hand	Yes----------1 No----------0	
	B. Quantities used	Yes----------1 No----------0	
	C. Losses and adjustments	Yes----------1 No----------0	
105	How often are these reports or orders for family planning and maternal health commodities sent to the higher level? *Circle all if they are applied in your facility*	Monthly.....A Every two month.....B Quarterly.....C Semi-annually.....D Annually .....E	
106	Where do you send the prepared reports or filled forms?	RHB ----------A ZHD----------B Woreda/district /health office----C PFSA----------D	
107	Which method established for sending LMIS report to higher level?	Supervisor----------1 staff by their resources----------2 others people traveling in the area----------3 using fax machine----------4 Using telephone----------5	
108	When was the last time you sent report/ order for family planning and maternal commodity at this facility?	Never .....1 within the last month--------2 Two months ago.....3 Three months ago.....4 Four months ago.....5 more than 3 months ago….6	

109	How often are you supposed to send these reports for family planning and maternal health commodities to the higher level? Circle all if they are applied in your facility	Monthly.....A Every two month .....B Quarterly.....C Semiannually.....D Annually.....E Other(specify)----------	
II	**Questions On Training**		
110	How did you learn to complete the forms/records for family planning and maternal health commodities used at this facility?	Never learned.....A During the logistics work shop--B On the- job- training.....C on the job (self-learning)….D Other (specify) ----------	
111	Have you ever received training in the proper storage of family planning and maternal health commodities?	Yes----------1 No----------0	
112	Have you ever receiving training in Ethiopian integrated pharmaceutical logistics system (IPLS) including family planning and maternal health commodities?	Yes----------1 No----------0	
113	Have u trained to complete IFRR and RRF and calculating the family planning and maternal health commodities needs for your facility?	Yes----------1 No----------0	
III	**On Inventory management**		
114	Does this facility use a minimum- maximum stock level (months) for family planning and maternal health products?	Yes----------1 No----------0	If no skip 116
115	What (in months) is the minimum- maximum stock level for family planning and maternal health commodities respectively?	One and two month.....0 two and three months.....1 three months.....2 two and four months.....3 More than 4 months.....4 Others(specify)---------- NA/DK.....9	
116	Does this facility use an emergency order point for family planning and maternal health products?	Yes----------1 No----------0	If No, skip 119
117	What (in months) is the emergency order point for family planning and maternal health products?	Two weeks .....1 One month.....2 Two months.....3 Three months.....5 Four months.....6 More than 4 months.....7	

		NA/DK.....9	
118	How many emergency orders have you placed in the last six months?	None…….0 One...……1 Two...……2 Three……3 More than three----------4	
119	Does the facility conduct at least one annual physical inventory check of all family planning and maternal health products?	Yes----------1 No----------0	
120	Who determines how much of family planning and maternal health products this facility should order?	The staff here at the facility itself----------A Higher level facility----------.B Others (specify) ----------	
121	Who determines how much of family planning and maternal health commodities this facility should receive?	The staff here at the facility itself.....A Higher level facility.....B Other (specify) ----------	
122	How does your facility determine how much of family planning and maternal health products to order?	Formula(consumption).....1 don't know..... .....2 Allocation by higher level---------3 Available funding----------4 Forecasting----------5 other means (specify) ----------	
IV	**On Transportation**		
123	Who is responsible for transporting family planning and maternal health products to your facility?	Higher level drivers.....A This facility collectors.....B Local supplier drivers.....C others (specify) ----------	
125	Does your facility have functioning vehicles for the transport of family planning and maternal health products?	Yes----------1 No----------0	
126	On average, approximately how long does it take between ordering and receiving family planning and maternal health products?	One day.....1 Less than one week.....2 2 weeks to 1 month .....3 between 1 and 2 months------4 More than 2 months 5	
V	**On supervision**		

127	When did you receive your most recent supervision visit?	Never received.....1 within the last month.....2 Within the last 3 months.....3 within the last 6 months.....4 More than 6 months ago.....5 other (specify) ----------	
128	When did you receive your last supervision visit that included family planning and maternal commodity logistic management (e.g. Stock cards checked, reports checked, expired stock removed, supplies checked)?	Never received.....1 within the last month.....2 Within the last 3 months.....3 within the last 6 months.....4 More than 6 months ago.....5 other (specify) ----------	If NO skip next page
129	Was the Supervision Check List used for the supervision?	Yes----------1 No----------0	
130	Who conducted the last supervision visit on logistic management? *Circle all if they are applied in your facility*	FMOH……A RHB……B ZHD ……C WHO……D PFSA----------E Partner/Donor……..F	
131	Are such supervision scheduled?	Yes----------1 No----------0	
132	Does the facility receive feedback on LMIS (supervision finding) reports?	Yes----------1 No----------0	
133	What feedback mechanisms are in place to channel logistics information back to lower levels?	Reports----------1 to telephone ----------3 Meetings----------2 during supervision visit ----------4 Electronic by email/ fax----------5 others (specify) ----------	

Thank you for your time and information. You have been very helpful. Our remaining Question will require looking at products in the storeroom and speaking with the person who Oversee the store. When in the Store Room (if with a different person): Introduce all team members and ask facility representatives to introduce themselves. Explain the objectives of this survey (annex one):

No	Question	Code classification	Go to
01	Position of person interviewed for this section	----------	
02	Number of years and months you have worked at this facility?	Years:_____ Months: _____	
03	Who is the principal person responsible for managing family planning and maternal commodities at this facility?	Pharmacist ……..….1 midwifery ----------2 Pharmacy technical ……3 other (specify) ----------	
04	Is supplies/stock management the primary role of this person at this facility?	Yes …… 1 No …….0	
05	Are stock cards/electronic stock cards recorded using the smallest unit of count (for example, cycles for pills, vials for Depo-Provera, ampule for oxytocin and pieces for condoms, Norplant and IUCD)?	Yes----------1 No----------0	
06	Are there any family planning and maternal products you usually run out of before resupply?	Yes----------1 No----------0	If NO go to Q8
07	If yes, list the three most frequent family planning and maternal commodities	----------	
08	If you run out of family planning and maternal health products, what do you do?	Go to the next higher level for resupply .....A Buy from the open market /NGO.....B Refer clients to other facilities .....C Borrowed from other health facilities .....D Other (specify).....	
09	Are there any family planning and maternal health products you usually have a surplus of before resupply?	Yes----------1 No----------0	
10	If yes, list the three most frequent?	----------	

11	What you normally did with the items in case of over stocking/surplus?	Communicate with peer facilities----------1 Return the goods to their perspective suppliers--- 2 Store future use ----------3	

Format 1: Quantity Ordered and Quantity Received (order fill rate)

EOP (Months) _____ Maximum stock (Months) _____ Order interval (Months) --------

	FP and maternal products	Unit	Quantity Ordered for the Last Order that has been delivered	Date Order Placed	Quantity Received in Last Order	Date Order Received
1	Oxytocin 1mg/ml	Ampule				
2	Magnesium sulfate 50mg/2ml	Vial				
3	Misoprostol 200mg	Tab				
4	Combined oral pills (Microgynon)	Cycle				
5	Depo-Provera 150mg/1ml	Vial				
6	IUCD (Copper T 380A)	Piece				
7	Jadelle(levonorgestrol 75 mg)	Set				
8	Implanon (etonorgestril 68mg)	Set				
9	Condom (M)	Piece				
10	Minipills(levonorgestrel 0.03mg)	Cycle				
11	Emergency pills (levonogestrol 0.75mg)	Pills				
12	Condom(F)	Piece				
13	lo-femenal	Cycle				

Ask the person you interviewed if they want to ask you any questions. Comments or general observations on products management: Thank the person/people who talked with you. Reiterate how they have helped the program achieve its objectives, and assure them that the results will be used to develop improvements in logistics system performance.

Notes/Comments: ----------

Format2. Stock Status (Specify a full six month period prior to the survey; and the day of visit)

Column:

1. Name of all authorized family planning and maternal health products that will be counted
2. Unit of count for the family planning and maternal health products
3. Whether or not the family planning and maternal health products is managed at this facility, answer Y for yes or N if no. Note that for some family planning and maternal health products, at certain levels all facilities should manage them. In such cases, this column should be marked Y.
4. Check if the stock card is available, answer Y for yes or N for no. If column 4 is No, then column 5 and column 6 will be N/A.
5. Check if the stock card had been updated within the last 30 days, answer Y for yes or N for no. Note: If the stock card was last updated with the balance of 0 and the facility has not received any re-supply, consider the stock card up-to-date.
6. Record the balance on the stock card.
7. Record if the facility has had any stock-out of the family planning and maternal health products during the most recent 6 full months before the survey, answer Y for yes or N for no.
8. Record how many times the family planning and maternal health products stocked out during the most recent full 6 months before the survey according to stock cards, if available, or to a key informant if not. Note source information.
9. Record the total number of days the family planning and maternal health products was stocked out during the most recent full 6 months before the survey.
10. Record the quantity of family planning and maternal health products dispensed to user or issued from the storeroom (from stock card or bin card) during the most recent 6 months before the survey. Note: If the answer to column 4 is N, record NA in this column.
11. Record the number of months the issued data represents (may be less than 6); record the months for which there is any data recorded, including 0. Note: If column 4 is N, record NA in this column.
12. Record the quantity of family planning and maternal health products in the storeroom.
13. Record if the facility is experiencing a stock-out of the family planning and maternal health products on the day of the visit, according to the physical inventory, answer Y for yes or N for no.
14. Record the quantity of expired products. Count all expired family planning and maternal health products on the day of the visit. If there are family planning and maternal health products that are near expiry (within one week), note in the comments section.

Maximum months of stock_____ Minimum months of stock _____
Order interval_____

Product	Units of count	Managed at this facility?(Y/N)	Stock card/bin card available?(Y/N	Stock card/ bin card updated?(Y/N)	Balance on stock card/ bin card	Stock-out most recent 6	Number of stock-outs (most recent 6months) (#)	Total number of days of stock-out(s) (#)	Total units used/issued (most recent 6months) (#)	Number of months of data available #	Physical inventory (in store room) (#)	Stock-out today? (Y/N)	Quantity of expired products(#)
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Oxytocin	Amp												
Magnesium sulfate	Vial												
Misoprostol	Tab												
Combined oral pills (Microgynon)	Cycle												
Depo-Provera	Vial												
IUCD (Copper T 380A)	Set												
Jadelle(levonorgestrol 75 mg)	Set												
Implanon (etonorgestril 68mg)	Set												
Condom (M)	Piece												
Minipills, (levonorgestrel 0.03mg)	Cycle												
Emergency pills, (levonogestrol 0.75mg)	Pills												
Condom(F)	Piece												
lo-femenal	Piece												

Note: For any product that experienced a stock out and expired products in the last six months (including the day of the visit), please note reasons (by product).

Reasons for stock outs: 1= did not request the right amount at the right time 2= could not go to pick up the products due to vehicle problem 3=Higher level facility did not send enough products 4= Increase in consumption 5= flow of near expiry commodities from higher facilities to the lower facilities 6= Do not know 7=in consistent logistics reporting and data 8= no trained provider 9= no supply

Reasons of expired: 1= received nearly expiry date 2=similar items was used 3=over stocking of the items 4=poor estimation of required amounts 5=donation near expiry date 6=other specify----

Format 3: Stock data quality tables

A. Usable stock on hand on the day of the visit

1. List all types of contraceptives available in the facility by brand
2. Copy from stock status table (table 2-row.7)
3. Record stock on hand from physical inventory on the day of the visit.
4. Calculate the percentage of the discrepancy.
5. Note the reasons for the discrepancy

Stock on hand (day of visit)

FP and maternal products (1)	**unit**	**From physical Inventory (2)**	**From electronic SC / stock cards (3)**	**% Discrepancy (col.3-col.2/col.2) *100 (4)**	**Reasons for Discrepancy(5)**
Oxytocin	Ampule				
Magnesium sulfate	Vial				
Misoprostol	Tab				
Combined oral pills (Microgynon)	Cycle				
Depo-Provera	Vial				
IUCD (Copper T 380A)	Piece				
Jadelle(levonorgestrol 75 mg)	Set				
Implanon (etonorgestril 68mg)	Set				
Condom (M)	Piece				
Minipills,(levonorgestrel 0.03mg)	Cycle				
Emergency pills, (levonogestrol 0.75mg)	Cycle				
Condom(F)	Pieces				

B, Usable stock on hand at time of most recent LMIS report

1. List the same products as in format 3A in column 1.
2. Get the most recent LMIS report showing the selected products and write in the stock on hand from the LMIS report incol.2

In column 3, write the quantity of usable stock on hand from the stock records from the time of the selected LMIS report.

4. Calculate the percentage of discrepancy.
5. Note the reasons for the discrepancy.

Usable stock on hand (at time of most recent LMIS report)

FP and maternal products (1)	**Unit**	**According to most recent LMIS report(2)**	**From electronic SC / stock cards from time of LMIS report(3)**	**% Discrepancy (col.3-col.2/col.2)*100 (4)**	**Reasons for Discrepancy(5)**
Oxytocin	Ampule				
Magnesium sulfate	Vial				
Misoprostol	Tab				
Combined oral pills (Microgynon)	Cycle				
Depo-Provera	Vial				
IUCD (Copper T 380A)	Pieces				
Jadelle(levonorgestrol 75 mg)	Set				
Implanon (etonorgestril 68mg)	Set				
Condom (M)	pieces				
Minipills, (levonorgestrel 0.03mg)	Cycle				
Emergency pills, POP (levonogestrol 0.75mg)	Cycle				
Condom(F)	Pieces				
lo-femenal	Cycle				

ASSURANCE OF PRINCIPAL INVESTIGATOR

The undersigned agrees to accept responsibility for the scientific ethical and technical conduct of the research project and for provision of required progress reports as per terms and conditions of the Faculty of Public Health in effect at the time of grant is forwarded as the result of this application.

Name of the student: **ASHAGRIE ABERE**

Date._____ Signature _____

APPROVAL OF THE ADVISORS

Name of the first advisor: **SEID MUSSA**

Date._____ Signature _____

APPROVAL OF THE EXAMINERS

Name of the examiner: _____

Date._____ Signature _____