ADDIS ABABA UNIVERSITY COLLEGE OF
BUSINESS AND ECONOMICS

Assessment of Integrated Pharmaceutical Logistics System (IPLS) in Public Health Facilities at East Wollega Zone.

Research Thesis submitted to the Department of Logistics and Supply Chain management, School of Commerce, Addis Ababa University in Partial Fulfillment of the Requirements for the Degree of Master of Art (MA)

By: Getachew Nigusie (BPharm.)

Advisor: Matiwos Ensermu

June 2017

ADDISABABA, EHIOPIA
ADDIS ABABA UNIVERSITY

SCHOOL OF GRADUATE STUDIES

Assessment of Integrated Pharmaceutical Logistics System in Public health

facilities at East Wollega Zone.

By: Getachew

Nigusie

Department of Logistics and Supply Chain management, School of Commerce,

Addis Ababa university

Approved by the Examining Board

______________________________  _________________________
Chairman, Dep. Graduate Committee  Signature

______________________________  _________________________
Advisor  Signature

______________________________  _________________________
External Examiner  Signature

______________________________  _________________________
Internal Examiner  Signature
DECLARATION

I the undersigned, declare that this is my original work and has never been presented for the degree in this or any other university and all the source materials used for this thesis have duly acknowledged.

Name of the student: Getachew Nigusie (BPharm.)

Signature: _______________________________________

Date of submission: ________________________________

This thesis has been submitted with my approval as University advisor.

Advisor: Matiwos Ensermu / PHD, Associate Professor of Logistics and Supply Chain Management /

Signature: _______________________________________

Date of submission: ________________________________
Acknowledgements

First, I would to express my deepest gratitude thank to my advisor Dr. Matiwos Ensermu for his unreserved guidance and support in preparing this Thesis.

I extend my deep gratitude to all health facility in-charges and their store keepers’ in-charges for giving me maximum cooperation during data collection.

I wish to express my heart-full thanks to all my friends who had contributed their time and efforts to support and encourage me throughout this study.

I am highly indebted to my wife, Mrs. Martha Seifu, My daughter, Fenet and my son Nathan for their unending love, faith, understanding and prayer throughout this study.

Finally, I would like to thank Addis Ababa University school of Commerce for giving me this chance to attend this LSCM post graduate program.
DEDICATIONS

I would like to dedicate this Thesis to all stakeholders who are engaged to Public pharmaceutical supply chain management of Program drugs in Ethiopia, in the sense that these findings will contribute to the strengthening of pharmaceutical management of Program drugs and sustainable management of such drugs at all health facility levels, for the sake of improving commodity security.
List of acronyms

**IPLS:** Integrated Pharmaceuticals Logistics System

**LMIS:** Logistics Management Information System

**PFSA:** Pharmaceuticals Fund and Supply Agency

**RHB:** Regional Health Bureau **RRF:** Report and Requisition Form

**NGO:** None-governmental organizations

**IFRR:** Internal Facility Report and Requisition Form

**LSAT:** Logistics System Assessment Tool

**LIAT:** Logistic indicators Assessment Tool

**PFSA:** Pharmaceutical Fund and Supply Agency

**WoHo:** Woreda Health Office

**ZHD:** Zonal Health Department

**SOP:** standard Operating Procedure

**OI:** Opportunistic Infections

**TB:** Tuberculosis

**HIV:** Human Immune Deficiency Virus

**ARV:** Anti Retrovirus

**ART:** Antiretroviral Treatment

**HPMRR:** Health Post Monthly Report and requisition form

**MOH:** Ministry of Health

**HCMIS:** Health Commodities Management Information System

**GDP:** Good Distribution Practice

**RDF:** Revolving Fund Drugs

**FP:** Family Planning

**MNCH:** Mothers, Neonatal and Child Health

**USAID:** United States Agency for International development

**HIV/AIDS:** Human Immuno Deficiency virus/Acquired Immuno deficiency diseases syndrom
Table of Contents

Abstract ........................................................................................................................................1

Chapter One ................................................................................................................................1
1. Introduction .................................................................................................................................1
1.1. Background of the study ..........................................................................................................1
1.2. Statement of the Problem .........................................................................................................3
1.3. Research Question ....................................................................................................................6
1.4. Research Objectives ................................................................................................................6
1.5. Significance of the Study .........................................................................................................7
1.6. Scope of the Study ....................................................................................................................8
1.7. Limitation of the Study ..........................................................................................................8
1.8. Definition of Terms ...............................................................................................................9

Chapter Two ................................................................................................................................11
2. Review of Related Literature ....................................................................................................11
2.1. Pharmaceuticals Supply chain management ..........................................................................11
2.2. Availability and utilization LMIS recording and reporting formats .....................................13
2.3. Budget .....................................................................................................................................13
2.4. Professionalization in Supply Chain Management and staff commitment .......................14
2.5. Pharmaceutical Logistics Management Information System (LMIS) .................................15
2.6. Supportive supervision ...........................................................................................................17
2.7. Inventory management and proper storage .............................................................................18
2.8. Transportation and Distribution ............................................................................................19
2.9. Monitoring and Evaluation .....................................................................................................19
2.10. Conceptual Framework .........................................................................................................20

Chapter Three .............................................................................................................................21
3. Research Methodology ..............................................................................................................21
3.1. Description of the Study Area ...............................................................................................21
3.2. Research Design .....................................................................................................................21
3.3. Population and Sample ..........................................................................................................21
3.4. Data Sources and Types ........................................................................................................22
3.5. Data Collection Procedures .................................................................................................22
3.6. Variables of the Study ..........................................................................................................23
3.7. Ethical Consideration ............................................................................................................23
3.8. Data Presentation, Analysis and Interpretation ....................................................................23
Chapter Five

4.1.1. Percentage of Store keepers by Sex.................................................................24
4.1.2. Age of SDPs’ store keepers ...........................................................................24
4.1.3. Experience of Distribution of store keepers ..................................................24
4.1.4. Qualification and Profession of store keeper..................................................24
4.1.5. IPLS training status .......................................................................................25
4.3. Facility type .........................................................................................................25
4.4. Distance of SDPs From Supplier (PFSA) ............................................................25
4.5. Availability of expired program drugs at SDPs...................................................26
4.6. Availability & usage of bin card at store .............................................................27
4.7. Availability & usage of bin card at Dispensaries ...............................................27
4.8. Availability and Usage of IFRR by Dispensaries................................................28
4.2. IFRR (Data) Quality .........................................................................................29
4.9. RRF Reporting rate of SDPs .............................................................................29
4.10. Data (RRF) quality ..........................................................................................30
4.11. LMIS training Modality ..................................................................................31
4.12. Programs’ drugs stock status .........................................................................32
4.13. Frequency of RRF reporting ..........................................................................34
4.14. Type of software used to manage PDs .............................................................35
4.15. Functionality of software at the date of Visit ...................................................35
4.16. Functions of software .....................................................................................36
4.17. Supportive Supervision Access of SDPs .........................................................37
4.18. Frequency of External Supervision Access by SDPs within last 3 months .......38
4.19. Supervisory Body .........................................................................................38
4.20. Activities done by supervisors .......................................................................39
4.21. Supervisors Feedback ....................................................................................40
4.22. Distribution Modality ....................................................................................40
4.23. Internal Factors .............................................................................................41
4.24. Number of emergency orders SDPs placed during the last 3 months ............42
4.25. Facilities that have 100% order fill rate ............................................................42
4.26. Lead time of PD .............................................................................................43
4.27. SDPs Internal factors .....................................................................................44
4.28. SDPs storage space and shelving status .........................................................46
4.29. IPLS Implementation ....................................................................................46
4.30. Associated factors .........................................................................................47

Chapter Four ............................................................................................................24
5. Discussion, concussion and recommendations ............................................. 51
5.1. Discussion ................................................................................................. 51
5.2. Conclusion ................................................................................................. 53
5.3. Recommendation ....................................................................................... 54
6. References ..................................................................................................... 55
7. Data Collection Instrument (Attach it as an appendix) ................................ 57

List of tables

<table>
<thead>
<tr>
<th>Table</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table 1</td>
<td>Demographic Characteristics of store keepers, Facility type, facility service type and distance from PFSA</td>
<td>26</td>
</tr>
<tr>
<td>Table 2</td>
<td>availability of expired PDs at SDPs</td>
<td>27</td>
</tr>
<tr>
<td>Table 3</td>
<td>Crosstabulation of SDP type and Data(RRF) quality</td>
<td>31</td>
</tr>
<tr>
<td>Table 5</td>
<td>Tracer drugs stock status of East Wollega SDPs by service type</td>
<td>33</td>
</tr>
<tr>
<td>Table 6</td>
<td>stock status of PD (Malaria, FP, TB and ART)</td>
<td>33</td>
</tr>
<tr>
<td>Table 7</td>
<td>frequency of reporting period</td>
<td>34</td>
</tr>
<tr>
<td>Table 8</td>
<td>Function of Available stock management software</td>
<td>36</td>
</tr>
<tr>
<td>Table 9</td>
<td>Lead time of Direct and indirect distribution modality SDPs</td>
<td>43</td>
</tr>
<tr>
<td>Table 10</td>
<td>SDPs Internal factors that could affect IPLS implementation</td>
<td>45</td>
</tr>
<tr>
<td>Table 11</td>
<td>IPLS prevalence of SDPs</td>
<td>47</td>
</tr>
<tr>
<td>Table 11</td>
<td>Crude factors of IPLS implementation at East Wollega, Oromia, Ethiopia, 2017</td>
<td>48</td>
</tr>
<tr>
<td>Table 12</td>
<td>Factors associated with implementation of IPLS in East Wollega zone, Oromia, Ethiopia, 2017</td>
<td>49</td>
</tr>
</tbody>
</table>

List of Figures

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figure 1</td>
<td>LMIS cycle (Mezid, 2014)</td>
<td>12</td>
</tr>
<tr>
<td>Figure 2</td>
<td>Conceptual Framework</td>
<td>20</td>
</tr>
<tr>
<td>Figure 3</td>
<td>Availability of Updated bin card at SDPs’ store</td>
<td>27</td>
</tr>
<tr>
<td>Figure 4</td>
<td>availability of Updated Bin Card at SDPs’ dispensaries</td>
<td>28</td>
</tr>
<tr>
<td>Figure 5</td>
<td>Availability &amp; usage of IFRR</td>
<td>28</td>
</tr>
<tr>
<td>Figure 6</td>
<td>quality of IFRR data</td>
<td>29</td>
</tr>
<tr>
<td>Figure 7</td>
<td>percentage of SDPs that sent RRF for two consecutive reporting periods</td>
<td>30</td>
</tr>
<tr>
<td>Figure 8</td>
<td>Quality of RRF data</td>
<td>31</td>
</tr>
<tr>
<td>Figure 10</td>
<td>Type of software used by SDPs</td>
<td>35</td>
</tr>
<tr>
<td>Figure 11</td>
<td>Functional status of Software</td>
<td>35</td>
</tr>
<tr>
<td>Figure 12</td>
<td>SDPs Access to IPLS supportive Supervision within last three months</td>
<td>37</td>
</tr>
<tr>
<td>Figure 13</td>
<td>Frequency of external IPLS supportive supervisors</td>
<td>38</td>
</tr>
<tr>
<td>Figure 14</td>
<td>Number of SDPs received IPLS supervision by different external Supervisory body during last 3 months</td>
<td>39</td>
</tr>
<tr>
<td>Figure 15</td>
<td>Check list of external supervisors</td>
<td>39</td>
</tr>
</tbody>
</table>
Figure 16: Percentage of SDPs received feedback from supervisors ........................................40
Figure 17: SDPs’ Distribution modalities ..................................................................................40
Figure 18: Number of emergency orders place by SDPs .................................................................42
Figure 20: Lead time of SDPs .....................................................................................................43
Figure 21: availability of enough shelving and storage at SDPs’ stores ........................................46
Abstract

Different efforts have been made to implement and build strong pharmaceuticals supply chain management system in the country through creating integrated pharmaceutical logistics system. There was significant improvement in health commodity logistics system management. However, the system was not yet strong enough to the expected level due to different reasons. Therefore, the objective of this investigation was to provide information on the level of Integrated Pharmaceutical Logistic System (IPLS) implementation in East Wollega public health facilities using cross-sectional descriptive study. In this study, all East Wollega Health facilities were selected and quantitative data collection tool called ‘Logistics Indicators Assessment Tool (LIAT)’ was administered to different service delivery Points (SDPs) such as Hospitals, Antiretroviral Treatment (ART) health centers, Prevention Mother to Child Transmission (PMTCT) only health centers and Non-ART and Non-PMTCT health centers. As a result, health professionals who were responsible in handling health commodities at SDPs stores were the main respondents of this assessment. The sample size was 66 (23 ART sites, 23 Non-ART-Non-PMTCT sites and 20 PMTCT sites’) store keepers working at these SDPs. At these SDPs using Logistics Management Information System (LMIS) formats the stock status of selected tracer drugs from ART, Malaria, RPH and TB program was assessed by using 36 tracer drugs selected by United States Agency for International development(USAID)Ethiopia from Malaria, family planning, TB and HIV/AIDS programs (2016). Finally, the gathered data from these SDPs were reconciled and finally analyzed using SPSS version 16 according to their service type differently and found that the prevalence of IPLS Implementation was 32.8%.
Chapter One

1. Introduction

1.1. Background of the study

Pharmaceutical Logistic is the process of planning, implementing, and controlling procedures for the efficient and effective flow and storage of pharmaceuticals including services, and related information from the point of origin to the point of consumption, for commodity security purposes (SPS, 2013).

Logistics activities as the operational component of supply chain management, includes warehousing, customer service, inventory management, transportation, distribution, material handling, packaging and data collection and reporting (Tilahun et al, 2016). Health logistics system is responsible to ensure every customer able to obtain and use quality pharmaceuticals (USAID | DELIVER, 2011). However, developing a supply chain that can manage thousands of different and quality health commodities require very efficient and effective IPLS implementation. The IPLS is a system for managing various categories of health commodities (drugs, reagents, supplies, vaccines and other), using a single set of integrated procedures and In Ethiopia it is a type of indent system where central Pharmaceuticals Fund and Supply Agency(PFSA); PFSA hubs, WoHo, hospitals, health centers, health posts, and hispensaries units to issue and order quantities of each Pharmaceuticals asper their needs and within their budget using pull system (Shewarega et al, 2015).

The purpose of IPLS is to allow each facility to determine its own needs, assists in managing drug finances, reduces the number of forms previously used in vertical systems, enhances record keeping, facilitates supportive supervision, promotes a more rational use of medicines and transportation enables data collection for planning and budgeting, minimizes wastage and pilferage, relies on the lessons already learned from other systems particularly the indent System,
a system for ordering essential medicines that has been tested and demonstrated to be effective in dispensaries and health facilities where it is implemented (USAID | DELIVER, 2011).

To be successful, the IPLS must fulfill the six rights of supply management. The system, and its staff, must ensure that: The right item, in the right quantity, the right quality, is available at the right place, at the right time and with the right cost (EPHI, 2013).

Ethiopian pharmaceutical supply chain system had encountered with many problems such as stock out, wastage (expiry and damage), insufficient distribution and poor warehousing, poor record keeping, unaffordability, poor inventory management and irrational drug use (Shewarega et al, 2015). To overcome these problem PFSA and none-governmental organizations (NGO) partners (Deliver and Supply chain management system (SCMS) projects) introduced IPLS in 2009 G.C (Tilahun et al, 2016).

Therefore, in this study I will Assess the inventory management system (Minimum and maximum stock levels, efficiency of distribution and warehousing, staff commitment and Professionalization, and management support along supply chain members to know the implementation status of IPLS. Similarly, the quality of report collected from SDPs and the availability and update of LMIS documents such as Bin card, Inter-facility reporting and requesting form (IFRR), Reporting and request form (RRF) and stock cards.

Hence IPLS is the primary mechanism through which all public health facilities obtain essential and vital pharmaceuticals by fulfilling the six rights of logistics system through implementing effective, efficient and simple system.

Managing pharmaceuticals and other health commodities through the IPLS is a strategy to enhance the smooth flow of commodities and prevent frequent stock outs of essential drugs and critical items that could hinder quality of services and it also prevent country from unnecessary wastages and insures continuous availability of pharmaceuticals through resource saving mechanism (Amenyah et al, 2015). In general, this study will assess the status of IPLS implementation at public health facilities in East Wollega, Oromia, Ethiopia by using different Variables such as availability of enough and trained staff, LMIS formats, and quality of RRF (complete, timely, and accuracy of facilities), adequate Supportive supervision, Inventory management system, Good Distribution practice (GDP) and others.
1.2. Statement of the Problem

In Ethiopia, there are many people living with chronic diseases such as diabetics, hypertensive, psychosis, etc. and infectious diseases such as HIV/AIDS, Malaria, Tuberculosis (TB), Neglected tropical diseases and other programs such as Family planning, mother and Child health that need comprehensive services along uninterrupted supply management system from the point of testing, treatment, monitoring and palliative care (Anna, 2013). As an example, offering HIV testing and treatment should become standard practice wherever they are likely to enhance the health and well-being of the individual (The United Republic of Tanzania ministry of health, 2012). However; underdiagnoses and undertreatment, misdiagnosis and mistreatment of infectious diseases such as HIV resulting from poor supply chain management of laboratory reagents, supplies and ART drugs can lead to overstock and stock out that will lead to incorrect prescribing of treatment, wastage of resources, and poor patient clinical management (SPS, 2013).

Therefore, managing pharmaceuticals supply chains is a big challenge, especially in developing countries like Ethiopia (Tilahun et al, 2016).

In Ethiopian, pharmaceutical logistics system was weak, consistently being hampered by several systemic problems that cause frequent stock outs of critical items, thus impeding continuity and quality services (SPS, 2013 and Desalegn et al, 2016). There were multiple parallel supply chain systems for different programs, lengthy processes and multiple layers in the supply chain systems, multiple players in the forecasting and procurement, storage and distributions, and inventory management and decision making in the Ethiopian health supply chain systems and there were multiple duplications of efforts at national and regional levels of the health supply chain management system (Desalegn, 2015).

Since its establishment in 2007, PFSA, the lead organization managing the health care supply chain of the country, has been working to ensure the availability, accessibility, and affordability of essential medicines with appropriate quality, safety, and efficacy. To achieve these goals, PFSA supported by its partners has designed and implemented various innovative programs to made improvements in its management capacity, infrastructure and storage and fleet management. The (IPLS is one of the major interventions to create a strong, unified, healthcare supply chain, to
connect all levels of the supply chain, and to provide accurate and timely data for decision making (Shewarega et al, 2015).

Prior to the beginning of IPLS in Ethiopia various health programs including family planning, HIV and AIDS, tuberculosis (TB), and malaria used their own fragmented vertical logistics systems to manage pharmaceuticals and related commodities (Shewarega et al, 2015). While individual programs helped in the short term, gaps remained and the fragmented vertical logistic systems were not sustainable. With the introduction of IPLS (Horizontal Integrated logistic system), PFSA and its partners established an integrated health commodity supply chain that would include all health program commodities in 2009; it would also connect all levels with accurate and timely data for decision making (SPS Project, 2013).

Integrated pharmaceutical logistics system (IPLS) is the system which can ensure access to quality, safe, affordable and uninterrupted supply of vital and essential Medicines, if it is operated perfectly at different level of supply chain members (Service Delivery points (SDPs), Suppliers, Non-governmental organizations (NGOs), Federal ministry of health (FMOH), Regional health bureau (RHBs), Zonal Health departments (ZHDs) and Woreda Health offices (WoHos)) according their roles and responsibilities and IPLS has been designed and implemented in Ethiopia since 2009 (USAID | DELIVER PROJECT, 2011). The system was established to one single supply chain system that can provide pharmaceuticals to hospitals, health center and health posts found in Ethiopia as Pharmaceutical Fund and supply Agency (PFSA) is the main actor.

Currently PFSA manages integrated supply chain management system for human immuno deficiency virus (HIV), tuberculosis and Leprosy (TB) and family planning products and newly Malaria products regularly (bimonthly) resupplied over 2,300 health facilities (Desalegn, 2015).

However, there are still complains and questions from different levels of the Ethiopian health system about the efficiency, responsiveness, capacity and management of PFSA.

IPLS recommends all pharmaceuticals to be managed by facility pharmacy professional (druggist and pharmacist) store managers. However with regard to it implementation, store managers/pharmacy professionals are not well trained and familiarized with the system, Varity of packaging, unique characteristics , special storage and management of short shelf life products; moreover, due to demand variability, rapid change of Technology and also the same commodity
may be used for a variety of different uses, and even different diagnostic methods to diagnosis one disease; it is becoming time consuming and difficult to store managers to calculate actual consumption, ordering and resupplying pharmaceutical (Amenyah et al, 2015).

Even after introduction of IPLS it is common to observe supply and service interruptions at SDPs. And this study was showed the supply chain members with the status of the IPLS implementation at this study area (East Wollega Zone).

Using a phase-based approach, IPLS is now implemented in most of the public health facilities in the country. Phase I ART SDPs started implementing the IPLS in 2011; phase II facilities PMTCT SDPs in 2012; and phase III facilities smaller health centers started IPLS in 2013.

Since the inception of IPLS in 2009, the two projects (SCMS & DELIVER) have collaborated closely and leveraged each other’s strengths to improve commodity reporting and distribution. So far, more than 2,300 health facilities have fully implemented IPLS (Desalegn, 2015). PFSA, in partnership with both SCMS and the USAID|DELIVER PROJECT, has designed a range of strategies and interventions, including developing SOPs; expanding the logistics capacity of FMOH and PFSA staff; improving infrastructure in facilities and warehouses; providing monitoring and evaluation, training, and supportive supervision in facilities; and implementing electronic logistics management information systems (USAID/DELIVER PROJECT, 2014).

Routine monitoring reports show that IPLS is improving information recording and reporting, storage and distribution systems, as well as the availability of essential commodities at SDPs. However, the IPLS has not had an official, representative study to assess the progress made to this point and identify its weaknesses. Therefore, I was preferred to assess the status of IPLS implementation in East Wollega public facilities.
1.3. Research Question

The following were the main research questions of the study:

a. To what extent IPLS is improving the East Wollega public health supply chain system?

And sub problems were: -

b. What was the key strength and weakness of the East Wollega public health supply chain regarding IPLS Implementation?

c. How Well East Wollega Health Facilities integrated with PFSA and Other Stakeholders to improve Commodity security?

1.4. Research Objectives

1.4.1. General objective

To provide information on the extent of IPLS implementation at East wollega public health facilities.

1.4.2. Specific objectives

To assess quantitatively selected inventory management and logistics system management practices within the system, including the use of recording and reporting formats, transport and distribution, supervision, and training.

To determine the prevalence of IPLS implementation at facilities.

To Assess the logistic system performance, such as order fill rate, stock out rate, reporting rate and wastage rate.

To Identify associated factors that affect IPLS implementation to help determine the next steps needed for logistics system improvements.
1.5. Significance of the Study

The findings of this study had the follow practical benefits

1. FMOH, Oromia Regional Health Bureaus, PFSA and stakeholders will see the Zone’s public health SCM progresses and strengths in terms of IPLS implementation.

2. PFSA and its stakeholders will use it to see the spectrum of the public health SCM including the strength, weaknesses and challenges. It will also provide the major SCM concerns to decision makers and stakeholder.

3. PFSA and its stakeholders will use the findings to improve the management of the Pharmaceutical Supply chain.

Generally, this study report will be a good resource for the public and scholars by

  Providing information about the status of Ethiopian public health SCM from the study point of view
  Serving scholars as a resource for future assessments and studies in the area.
  Shows PFSA and partners the resources required to create an integrated system.

As per my knowledge, there was no previous study in this study area. Therefore, this study was timely and important. It will provide information on public health supply chain management in the area and will benefit the Oromia RHB and ZHD, PFSA, partners and health facilities in understanding, strengthening and Scaling up the public health SCM.
1.6. **Scope of the Study**

The scope of the study was tried to address; the assessment of the status for IPLS implementation, including availability and applicability of LMIS formats, trained and Adequate manpower, timely and quality report, trends and completeness, stock out rate, report rate, order fill rate, Staff and management commitment at:

East Wollega public health facilities, with a focus on tracer drugs Especially program health commodities.

public-sector health facilities: Nekemte PFSA hub, hospitals, and health centers.

1.7. **Limitation of the Study**

The focus of this study was the implementation of IPLS mainly and the availability of selected Program tracer drugs selected by USAID public at health facilities and Nekemte PFSA hub; it wasn’t look at system implementation or availability at the ZHD, WoHo level and health posts found in the Zone that were part of this supply chain members and it wasn’t assessed documentation and implementation at health facilities dispensaries in detail except availability of tracer drugs, Bin card and IFRR.

The emphasis was on selected essential program medicines (ART, Malaria, FP, TB and MNCH) for East Wollega public health it did not looked at the availability of Revolving Fund Drugs (RDF) items.

The study was done only in East Wollega zone since these facilities are nearby to Nekemte PFSA hub and relatively more accessible for distribution of commodities and collection of logistic information based on convenience data collection method. Because a representative survey of supply chain status prior to IPLS implementation was not found easily, it is difficult to compare current and previous implementation performance. The study was attempted to compile data from various sources to provide as much comparative analysis as possible.

Although health posts were members of IPLS implementation the data collected from health facilities (hospitals and health centers) may not be actual since health posts are considered as main customers of health facilities.
1.8. Definition of Terms

**Pharmaceutical Logistics:** Logistics is the flow of Pharmaceuticals material, related information, and money between consumers and suppliers.

**Supply Chain:** - A supply chain is a network that includes vendors of raw materials, plants that transform those materials into useful products, and distribution centers to get those products to customers.

**Supply chain management:** - Managing supply and demand, sourcing raw materials and parts, manufacturing and assembly, warehousing and inventory tracking, order entry and order management, distribution across all channels, and delivery to the customer.

**Integrated Pharmaceutical Logistics system:** - The Integrated Logistics System is a system for managing various categories of health supplies, using a single set of procedures. The ILS is a type of indent system where Dispensaries, Healthcenters, and Hospitals order quantities of each supply from resupplying agent, according to their needs and within their budget.

**Public Health Facilities:** - these are health facilities owned by the government of Ethiopia and managed under FMOH or regional health bureaus.

**Pipeline:** - The entire chain of physical storage facilities and transportation links through which supplies move from the manufacturer to the user, including port facilities, central warehouse, regional warehouses, district warehouses, all SDPs, and transport vehicles, including community-based distribution networks.

**Pharmaceuticals, supplies, commodities, goods, materials, products, and stock.** These items flow through a logistics system and are used interchangeably throughout this study and to mean any substance or mixture of substances used in the diagnosis, treatment, mitigation or prevention of a disease, and include medical instruments and medical supplies.

**Implementation of IPLS:** - According to this study operational definition; IPLS was said to be Implemented if Order fill rate was greater than 80%, Lead time was not more than 4 weeks, Number of emergency order during the last three months not more than one, stock out product must not be more than one per each programs, over stock and under stock couldn’t be greater than two items.
per programs, among assessed malaria, FP, TB and ART items and total Zonal SDPs reporting rate must be greater than 81%. On aggregate IPLS was implemented if 75% the above indicators were implemented.
Chapter Two

2. Review of Related Literature

2.1. Pharmaceuticals Supply chain management

“Pharmaceutical Supply chain management encompasses the planning and management of all activities involved in sourcing and procurement, manufacturing and all pharmaceutical logistics activities such as warehousing, Inventory management, Distribution and transportation, customer services. Importantly, it also includes coordination and collaboration with Pharmaceuticals channel partners, which can be suppliers, intermediaries, third party service providers, and customers. Supply chain management integrates supply and demand management within and across channel partners.”

The CSCMP defines logistics management as: -

“The part of supply chain management that plans, implements, and controls the efficient, effective forward and reverses flow and storage of Pharmaceuticals, services and related information between the point of origin and the point of consumption in order to meet customers’ requirement.

Logistics management is an integrating function, which coordinates and optimizes all logistics activities, as well as integrates logistics activities with other functions including marketing, sales manufacturing, finance, and information technology’” (USAID | DELIVER, 2011).

In other words, logistics can be considered activities as the operational component of supply chain management, including quantification, procurement, inventory management, warehousing, distribution, transportation and fleet management, and data collection and reporting. Supply chain management includes the logistics activities plus the coordination and collaboration of staff, levels, and functions.

This study focuses on specific pharmaceuticals logistics activities that are undertaken within the context of an integrated pharmaceutical logistics system model.
This model (IPLS) promotes collaboration and seamless linkages between the activities, levels and people responsible for managing the pharmaceuticals supply chain. Note that throughout the study, I can use the terms pharmaceuticals and health commodities interchangeably.

The ILPS system has been designed to accommodate the needs of all government facilities. It also, includes all non-governmental organizations (NGO), such as faith-based organizations (FBO), or other voluntary agencies (VA) that have been authorized by the Ministry of Health and related medical supplies from repurposing agents like PFSA. The IPLS includes all types of facilities, from dispensaries to referral hospitals. All organizations and facilities should complete the forms in the same way. As an Example, just like health posts send their monthly report (HPMRR) to health centers or Woreda health office, health centers or woreda also send the report (RRF) on bimonthly basis to PFSA hubs and the PFSA hubs similarly send their report to central PFSA using RRF to be resupplied on bimonthly basis. In all cases the procedure is the same, only their need is varying (Mark K and Mike A, 2015).
2.2. Availability and utilization LMIS recording and reporting formats

Various records (such as bin card) and reports (RRF and IFRR) are used in IPLS for recording and reporting of various logistics data sets. Assessment done by Tilahun et al, 2016 in Addis Ababa Public Health facilities on the availability and level of utilization of such formats by product and facility types was suggested that bin cards, IFRRs and RRFs were available among 96.2% of the health facilities. Among these facilities, 61.5% health facilities update bin cards regularly, and 84.6% of them complete and send IFRR to their respective facility stores, while 92.6% of the facilities were completing and sending RRF to supplying PFSA every two months. Evaluation of the level of completeness and accuracy of such records and reports was also must be taken into consideration. For example, to resupply the SDPs the supplier must get Timely, accurate and complete report from SDPs. Otherwise there might be over stock or stock out both at SDPs and Suppliers (Mezid, 2014).

2.3. Budget

Allocation and management of finances directly affect all parts of the pharmaceutical logistics cycle, including the quantities of products that can be procured, the amount of storage space that may be available, the number of vehicles that can be maintained, and the number of staff working in logistics. Mobilizing resources and securing a budget line item for health commodities and logistics activities is extremely important to ensure that products are available and that the logistics system operates effectively. To determine the resources needed to scale up, supply chain managers first need to assess what the expected costs are at different levels of the logistics system. When determining supply chains costs, managers should consider the cost of storage, transportation, and management; and determine what share of these costs each group will cover (i.e., Ministry of Health, donors, nongovernmental organizations (USAID | DELIVER, 2011).
2.4. Professionalization in Supply Chain Management and staff commitment

A logistics system can only work if well-trained, efficient staff monitor stock levels, place orders, and provide products to clients. Health programs assign the appropriate resources to staff (for example, supervision authority and technical knowledge) to complete logistics activities. In fact, some countries have established national logistics management units that analyze logistics data and provide feedback throughout the system. Organization and staffing, therefore, are important parts of the cycle. For a logistics system to work correctly, logistics staff must make the six rights a top priority (USAID | DELIVER, 2011).

At dispensaries health facilities, the dispensers or the staff in-charge of the pharmacy store are key persons in the ILPS. These staff may be pharmaceutical technicians, pharmacists, nurses or any other person assigned by the facility in charge to perform that task. The dispenser/store in-charge will do the following:

- Maintain stores records
- Conduct physical inventory at specified time
- Complete bimonthly RRF report and other quarterly reports and orders
- Issues supplies to dispensaries within facility
- Receive supplies from resupplying agents
- Monitor the storage of supplies properly

Ideally, a paradigm shift in work allocation should be considered to have more administrators and workers qualified in Pharmaceuticals supply chain issues, running health facilities. The medical qualifications doctors, Pharmacists and nurses possess do not necessary imply supply chain competence. However, since human resources allocation is the way to bring competency, all health workers involve in supply chain should be given corresponding medical supply chain related training. Continuous specific training of medical supply chain staff is imperative particularly those involved in selection, quantification, Procurement, Inventory and warehouse management at the Ministry and those who act as the interface between the national distributor (PFSA) and the health facilities. A model incorporating facility or office based training would be preferable and should incorporate a supportive follow-up (Supervision) Program (Mark and Mike, 2015).
2.5. Pharmaceutical Logistics Management Information System (LMIS)

SOP manual for IPLS (2015) stated that the purposes of LMIS is to collect, organize, and report information to other levels in the system in order to make decisions that govern the logistics system and ensure that all six rights are fulfilled for each client.

Ethiopia has LMIS developed by DELIVER/USAID (2009) and whose goal is to use historical data to accurately anticipate current and future supply requirement and provide a reliable supply of Program Pharmaceuticals to customers to avoid problems rather than just respond to them.

This system helping to forecasting or estimate the quantity of each product that will be dispensed to customers during future period.

Information technology has been applied to logistics and distribution: for example, tracking systems in transportation, and distribution planning systems. This creates better visibility of the distribution channel as well as allows better control of the logistics systems. Additionally, it tools such as RFID, barcodes, and EDI platforms have enabled firms to be more proactive in the management of inventory in the supply chain (USAID | DELIVER, 2011).

Ultimately, IT can lower coordination costs, and in supply chain context, can substantially improve transactional efficiencies through increased information sharing and communications capabilities, resulting in improved supply chain performance (Mark and Mike, 2015).

One of the reforms is the Pharmaceutical Logistics Master Plan (PLMP) which was introduced in 2009 with the aim of ensuring the uninterrupted supply of essential, quality and cost-effective pharmaceuticals at all health facilities (FMOH, 2009). To achieve this, the Pharmaceutical Fund and Supply Agency (PFSA) was created with mandates: to supply the entire country with both Program and Essential pharmaceuticals, as well as serve as the distribution entity for vaccines, other health facility supplies, and laboratory equipment (The World Bank, 2009). To execute its mandate in the area of pharmaceuticals supply in an efficient and effective manner, PFSA developed the integrated pharmaceuticals logistics system that integrates the drug requisition, distribution, and reporting of essential pharmaceuticals that used to be managed vertically into a single mechanism (FMOH, 2009). PFSA’s objectives include:

Improve availability of program and non-program pharmaceuticals nationwide from 55% to 100%
Reduce wastage rate from 8% to less than 2%
Reduce cycle time (forecasting, procurement, storage and delivery to public health facilities) from 491 days to 165 days on average
Establish a quality complaint system and ensure rational use of pharmaceuticals
Improve customer satisfaction in terms of availability and quality of service at public health facilities from 51% to 100% (FMOH, 2009)

In most cases the data generated from the Health Facilities (HF) are of poor quality because of little ability to organize, extract, and present information in a user-friendly way, lack of tools; absence of job descriptions showing that health providers are supposed to deal with data management; absence of information system resources support such as HCMIS and lack of relevant training to health professionals. Utilization of evidence also resulted significant improvement in solving problems of overstocking and stock out of medical supplies (Gibson, Honest and Leonard, 2013).

In 2009, the USAID aided DELIVER project introduced an automated health commodity management information system (HCMIS) that can significantly improve health facilities’ ability to manage supplies in their stores. The HCMIS is a locally-developed, user-friendly software package that helps health facilities manages all EDs, as well as medical and laboratory supplies. The HCMIS automatically receives and issues reports and orders, manages inventory, and produces a variety of commodity reports for store managers, pharmacists, and facility heads. Since the program began, the project has implemented the system in 205 selected health facilities throughout Ethiopia as of 2011 (John Snow Inc./DELIVER, 2012 and Mezid, 2014)
2.6. Supportive supervision

Supervision is an excellent opportunity to provide follow-up training, improve performance, and solve other systemic problems that contribute to poor IPLS implementation. Supervising the staff who work within the logistics system keeps it running smoothly and helps to anticipate needed changes. Routine, effective supervision, coupled with on-the-job training in logistics, helps to both prevent and resolve supply problems and human resource constraints (USAID/Deliver, 2011).

Supportive supervision is a process that promotes quality at all levels of the health system by strengthening relationships within the system, focusing on the identification and resolution of problems, and helping to optimize the allocation of resources (USAID/Deliver, 2014). Promoting high standards, teamwork, and better two-way communication. A cornerstone of supportive supervision is working with health staff to establish goals, monitor performance, identify and correct problems, and proactively improve the quality of service. Together, the supervisor and health workers identify and address weaknesses on the spot, thus preventing poor practices from becoming routine. Supervisory visits are also an opportunity to recognize good practices and help health workers to maintain their high-level of performance. (Children’s Vaccine Program at PATH, 2013).

Supervisors often lack the technical, managerial, or supervisory skills needed to effectively evaluate health facilities across the many sectors for which they are responsible. In addition to assessing performance, supervisors are also expected to monitor services, evaluate management, and ensure that the health facility supply chains are working properly, all in a short period of time. Consequently, they are unable to provide adequate technical guidance and feedback to improve service delivery (USAID/Deliver, 2014).

Supportive supervision requires staff time, costs for per diem, and travel to remote sites. Health budgets frequently do not allocate sufficient funds or personnel to conduct supportive supervision, making regular visits difficult to finance and coordinate. Furthermore, supervisors need support and authority from the central or district level to implement supervision or make changes to improve services at a health facility (Children’s Vaccine Program at PATH, 2013).
The primary goal is to improve morale and job satisfaction. Workers are facing a variety of job-related stresses which, unless they have help to deal with them, could seriously affect their work and lead to a less than satisfactory service to clients (Ivan and Aigul, 2009).

To insure the commodity security continuous IPLS supportive supervision and follow up of health facility staffs is required (Mulukn, 2015 et al)

In most cases the data generated from the Health Facilities (HF) are of poor quality because of lack of information use culture and feedback and supervision; and lack of relevant training (Gibson, Honest and Leonard, 2013)

2.7. Inventory management and proper storage

Inventory management is as important as like as that of managing the money at the bank (Mark and Mike, 2015). After an item is ordered and received, it must be properly stored until the customer needs it. A country’s inventory control strategy specifies how much stock to store and where to store it. Enough stock should be available to meet customer needs until a new order is received; but not so much that stocks expire or are wasted or that you exceed storage capacity. Storage has two purposes for products: (1) to ensure the quality or condition, and (2) to make them available for distribution (Desalegn, 2015).

A site-level survey of 42 facilities, conducted in 2013 in Addis Ababa city, showed that 95 percent of antiretroviral (ARV) drugs were available. An assessment done by the Dire Dawa city administration (2013) showed a reduction in the expiry rate for the region from 4.4 percent in 2009/2010 to 1 percent in 2011/2012. Patients at the health center are pleased that medicines are available to safeguard their health. According to Ahmedsam Abdella (2013), curative and rehabilitative core process owner at Dire Dawa RHB, this could not have been achieved without IPLS (USAID/DELIVER, 2014).

Similarly, assessment done by (Mulukn et al, 2015) in Amhara and Oromia regions on TB drugs shows that the stock out rate for facilities that are implementing IPLS was 17% and for facilities not Implementing IPLS was 23%. This shows that facilities not implementing IPLS has 1.5 times high stock out rate than the implementing facilities.
2.8. Transportation and Distribution

Pharmaceuticals distribution is the process of transferring products from the source of supply to the place of consumption. It is the art of getting the right type and amounts of commodities to the right places at the right time to the right facility. It involves transportation, delivery, and receiving of commodities, proper storage, and inventory control for receipt and disbursement and information systems. Information and reliable data is necessary to measure performance and determine Key Performance Indicators. Therefore, some countries use site visits or meetings. However, only a few countries have defined indicators and performance measurements. Distribution indicators should monitor frequency, reliability and condition of transport vehicles (USAID, 2011c) IPLS improves the drug supply chain by integrating drug requisition, distribution, and reporting into a single mechanism in Ethiopia Using PFSA of FMOH as leading agent (Muluken, 2015 et al).

2.9. Monitoring and Evaluation

Routine monitoring and periodic evaluation of the pipeline and logistics system activities help demonstrate how well the system is performing, the areas that can be improved, as well as the system’s impact on service provision. monitoring refers not only to the quality of the product, but also to the quality of the work and appears between each activity of the logistics cycle (Desalegn, 2015).

WHO outlines that there are weak mechanisms for monitoring and evaluation (M&E) of medicine availability at Health facilities. Therefore, WHO are committed in offering financial and technical assistance to develop M&E tools, to share and document good practice and to implement M&E-systems. Performance indicators and tools shall be developed, which monitor performance of the whole supply chain and thus availability of medicines at HCs (USAID/DELIVER, 2014).
2.10. Conceptual Framework

The following Figure Shows the relation between the Dependent IPLS implementation with listed Independent variables and finally the status was measured using IPLS indicators such as stock out rate, lead time, expiry rate etc.

**IPLS IMPLEMENTATION INDICATORS**
- Stock out Rate
- Expiry rate
- Lead time
- Order fill rate
- Reporting rate
- Data Quality (Accuracy & Validity)

**INDEPENDENT VARIABLES**
- Demographic characteristics
- IPLS training
- Management supports
- Supportive Supervision
- Distance from supplier
- Distribution modality (Direct or WoHo pass through (Indirect))
- Availability of LMIS formats
- Staff commitment
- Number of staff at pharmacy unit
- Store keeper Profession

**DEPENDENT VARIABLE**
- Implementation of IPLS

Figure 2: Conceptual framework
Chapter Three

3. Research Methodology

3.1. Description of the Study Area

The study was conducted in East Wollega Zone, Oromia Region in Ethiopia. East Wollega Zone has 17 woredas and 135 Kebeles with a total land area of 54,000 hectares or 540 km2. Per the 2010 census, the population is estimated at about 1,210,000 people. The potential health service coverage of East wollega was only 65%. The zone has 3 public hospitals, 63 public health centers and 121 health posts. Among these facilities 20 health centers and all 3 hospitals were ART sites and 20 health centers were PMTCT only site. From 4 ART sites 5 facilities are laboratory monitoring sites, the rest 23 health center are Non-ART & Non-PMTCT sites.

The study area was chosen because of the most accessible area and facilities are nearby to Nekemte PFSA hub, this helped for better implementation of IPLS compared to other parts of the zone and poor functioning of the system in such area could see how severe the problem was in the furthest areas of the remaining zones even in the country. In Addition to this there was no research in this area as per my knowledge and the implementation was not known the area.

3.2. Research Design

A Descriptive cross-sectional quantitative study was conducted in all public health facilities (Hospitals and health center) found in all woredas of East Wollega Zone. The study was conducted at the Service Delivery points (SDP) level hospitals, health centers, and at high pharmaceutical supply chain member PFSA.

3.3. Population and Sample

The study was census and the population was all public health facilities found in East Wollega zone and the sample size was 66 SDPs. East wollega zone public health facilities were selected based on probable cluster sampling. These were all public hospitals, all health centers and Nekemte Hub or which are known to implement IPLS. The sampling Technique was based on convinency method and used all East wollega health facilities as a source of population and East wollega Public
health facilities were study sample. To assess the availability tracer drugs and usage of LMIS formats such as bin card, 36 tracer drugs selected by USAID (2016) were used and their stock status was assessed using lottery method of sampling.

3.4. Data Sources and Types
The sources of data were both Primary data by using Interview questions to SDPs’ store keepers and group discussion with Nekemte PFSA hub technical staffs. In addition to these primary data, secondary was also obtained through inspecting the availability of selected items’ stock and LMIS formats by using SDPs’ RRF, IFRR, Bin cards and store and storage space and it infrastructures.

Secondary data was used to assess document review and observation of the availability of selected pharmaceuticals commodities and availability and applicability of IEMS documents such as IFRR, RRF and Bin card. Therefore, the source of data was Bin cards, IFRR, Models, receiving (GRV or GRM) and issuing (STV) invoices and RRF. The data generated from these data sources was availability of these IEMS documents, their applicability, their quality (accuracy, completeness, and timeliness).

3.5. Data Collection Procedures
The Logistics Indicators Assessment Tool (LIAT), a standardized quantitative data collection tool developed by the USAID | DELIVER PROJECT, and applied in many countries around the world, was selected to develop the instrument. The tool was adapted to this study context, including the IEMS-specific implementation indicators. The health facilities that were selected for the assessment are first located. Medical director of the facilities was approached to obtain consent for undertaking the data collection at the establishments. Following this, the logistics system performance data was collected with close collaboration from health facility’s pharmaceutical store managers.

In addition, Nekemte PFSA distribution coordinators and branch manager were focal persons during the data collection process.

Combination of different methods were used to collect data using the questionnaires and checklists for observation. Pharmacy professionals were Interviewed with key informants at selected East wollega public health facilities and Nekemte hub PFSA.
The Nekemte Hub PFSA was selected to employee the observation data collection methods, to Assess the IPLS Report (RRF) quality received from Health facilities.

The interview and Observation at Nekemte PFSA and 40 SDPs was conducted by principal researcher and the remaining SDPs data was collected by PFSA forecasting and capacity building team when they visit SDPs to give supportive supervision after detailed orientation of the data collection tool was given to this team.

The stock status, accuracy of records and reports associated with pharmaceutical commodities logistics was assessed by reviewing records and by conducting physical inventory of selected commodities. Results from the physical inventory and record review was reconciled to evaluate the level of discrepancy between Bin card and physical inventory. Facility’s store managers were further interviewed to enrich the findings from questioners and record review process.

### 3.6. Variables of the Study

#### 3.6.1. Dependent Variable

Implementation of ILS

#### 3.6.2. Independent Variables

- Shelfing and Storage space
- Demographic characteristics (Age, Sex, Profession, Experience and number of store keepers, and Facility Type, SDPs service type and distance from PFSA)
- IPLS training
- Management supports
- Supportive Supervision
- Distance from supplier
- Distribution modality (Direct or WoHo pass through (Indirect))
- Availability of LMIS formats
- Staff commitment
- Number of staff at pharmacy unit
- Store keeper Profession
3.7. Ethical Consideration

Ethical approval was obtained from Research and Ethical Review Committee of School of commerce. The school facilitated the issuance of support letter to East wollega Zonal Health Department, Subsequently, the Ethical Review Committee at East Wollega Health Department, after reviewing the proposal and research protocol, issued support letter to all concerned target facilities including health centers and hospitals.

Based on support letter from the zonal health department, the pharmaceutical logistics and pharmacy service unit at the Zonal Health Department issued support letter to the health facilities. Finally, informed consent from individual facilities and personnel involved in this assessment was obtained. Names of the health facilities assessed and key informants interviewed will be kept confidential throughout the process of data collection, analysis, presentation and interpretation of results.

3.8. Data Presentation, Analysis and Interpretation

The quantitative data was keyed into excel spread sheet and exported to SPSS 16 version analysis software for analysis. Descriptive central tendency statistical analysis (mean, standard deviation and percentage) was computed and summary results presented using tables, Pi-charts and graphs. Significant value (P-value), odds ratios with lower and upper bound was computed to see the association between selected dependent variable (IPLS implementation) and with selected independent variable using 95% confidence value.
Chapter Four

4. Result

Totally 66 SDPs’ stores were planned to be included in this study as a sample population and 64 SDPs’ store keepers were conceded. Therefore, response rate was 97%.

4.1. Demographic characteristic data

Demographic characteristic such as age, sex, experience, IPLS training status and profession of store keepers, facility type, SDPs’ service type, SDPs and distance from PFSA were assessed and the result was summarized on the following table 1.

4.1.1. Percentage of Store keepers by Sex.

As it was shown on Table 1 the number of male and female store keepers was 46 and 18 with percentage 71.9 % male and 28.1% female from totally 64 interviewed store keepers respectively.

4.1.2. Age of SDPs’ store keepers

From the studied SDPs’ store keepers 17 which was 26.6% were 20-30 years old, 40 store keepers’ that was 62.5% of the total respondents were within 30-40 years old and the rest 7 store keepers that accounts 10.7% included 40-50 years old age group. The mean was 1.84 or around 38 years old and standard deviation of 0.597. This study tried to grade the age intervals based on the civil servant (Pension)and ministry of education age grading system.

4.1.3. Experience of Distribution of store keepers

As it is shown table 1, 25 SDPs’ store keepers (39.1%) had less than 2 years, 28 SDPs’ Store keepers (43.8%) had between 2 and 5 years, 10 store keepers (15.6%) had 5 to 10 years and only 1 SDP store (1.6%) had above 10 years’ experience with 1.8 mean or around 4 years’ experience and 0.76 standard deviation. The grading of experience was done based on pharmacy professional hierarchy (Junior druggist less than 2 years’ experience, Junior Pharmacist less than 5 years’, senior druggist and pharmacist 2-5 years’ and 5-8 years’ respectively and expert Pharmacist above10 years) according to Food, Medicines and Healthcare Administration and Control Authority (FMHACA) professional proclamation (2014).
4.1.4. Qualification and Profession of store keeper

The IPLS manual prepared by PFSA (2015) clearly stated that store must be managed by pharmacy professionals (druggists and pharmacists). Using this the study tried to assess the profession and qualification of store keepers and found that 15 store keepers that accounted 23.4% were pharmacists, 25 store keepers were druggist which was 39.1% and the remaining store keepers 24 that was 37.5% were nurses or health officer in profession. Therefore 24 out of 64 (37.5%) SDPs store was managed by non-pharmacy professional.

4.1.5. IMLS training status

For the question demanded IMLS training status of SDPs’ storekeepers 47 (73.4) respondents replied that they got IMLS training and 17 (26.6%) responded that they didn’t take IMLS training.

4.2. Service type delivered by SDPs

Among 64 SDPs included in this investigation 23 of them were ART site that accounted 35.9% including the three hospitals found in the Zone, 19 SDPs which accounted 29.7% were PMTCT sites and all were health center in facility type, and 22 SDPs that took the remaining 34.4% were None ART-None PMTCT sites. This research assumed that the implementation status of IMLS would vary among different service site SDPs differently by doing correlation with Dependent variable based of operational definition of the investigator later on.

4.3. Facility type

The first question of data collection tool of this study demanded the facility type to assess the IMLS implementation status between hospitals and Health center. The ZHD (2017) told that there are one PFSA hub (1.5%), three hospitals (4.5%) and 63 (92.3%) health centers the East Wollega Zone and the study result was also shown on table 1.

4.4. Distance of SDPs From Supplier (PFSA)

The data collected from the route map of Nekemte hub PFSA was keyed into SPSS showed that 4 facilities (7.6%) found within 10km radius, 22 SDPs which were 33.8% found between 10km and 50km radius, 18 SDPs which accounted 27.7% found between 50km and 100km away from PFSA and 20 SDPs that accounted 30.8% were found between 100km and 200km away from PFSA with
mean 2.84 or around 84 km and standard deviation of 0.946. This study showed that all East Wollega SDPs found less than 200km radius. The research tried to see the effect of SDPs distance on the implementation of IPLS by affecting the good distribution system of east Wollega public sector pharmaceutical supply chain system by using P-value and odds ratio.

Table 1: Demographic Characteristics of store keepers, Facility type, facility service type and distance from PFSA

<table>
<thead>
<tr>
<th>Variables</th>
<th>Cases</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SDP Type</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hospital</td>
<td>3</td>
<td>4.7</td>
<td>4.7</td>
<td></td>
</tr>
<tr>
<td>Health Center</td>
<td>60</td>
<td>93.8</td>
<td>98.4</td>
<td></td>
</tr>
<tr>
<td>NGO/Private</td>
<td>1</td>
<td>1.6</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td><strong>SDPs’ service Type</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PMTCT Only</td>
<td>19</td>
<td>29.7</td>
<td>65.6</td>
<td></td>
</tr>
<tr>
<td>Non-ART &amp; Non-PMTCT</td>
<td>22</td>
<td>34.4</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td><strong>Distance from PFSA</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 10km</td>
<td>4</td>
<td>6.2</td>
<td>6.2</td>
<td></td>
</tr>
<tr>
<td>10km to 50km</td>
<td>22</td>
<td>34.4</td>
<td>40.6</td>
<td></td>
</tr>
<tr>
<td>50km to 100km</td>
<td>18</td>
<td>28.1</td>
<td>68.8</td>
<td></td>
</tr>
<tr>
<td>100km to 200km</td>
<td>20</td>
<td>31.2</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td><strong>Sex of store Keeper</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>40</td>
<td>71.9</td>
<td>71.9</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>18</td>
<td>28.1</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td><strong>Age of the store keeper</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20–30 year</td>
<td>17</td>
<td>26.6</td>
<td>26.6</td>
<td></td>
</tr>
<tr>
<td>30–40 year</td>
<td>40</td>
<td>62.5</td>
<td>89.1</td>
<td></td>
</tr>
<tr>
<td>40–60 years</td>
<td>7</td>
<td>10.9</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td><strong>Experience of store keeper</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 2 years</td>
<td>26</td>
<td>30.1</td>
<td>30.1</td>
<td></td>
</tr>
<tr>
<td>2–5 years</td>
<td>28</td>
<td>34.8</td>
<td>64.9</td>
<td></td>
</tr>
<tr>
<td>5–10 years</td>
<td>10</td>
<td>15.6</td>
<td>80.5</td>
<td></td>
</tr>
<tr>
<td>Above 10</td>
<td>1</td>
<td>1.6</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td><strong>Profession of store keeper</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pharmacist</td>
<td>15</td>
<td>23.4</td>
<td>23.4</td>
<td></td>
</tr>
<tr>
<td>druggist</td>
<td>25</td>
<td>39.1</td>
<td>62.5</td>
<td></td>
</tr>
<tr>
<td>Nurse/HO</td>
<td>24</td>
<td>37.5</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td><strong>IPLS training status of store keeper</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trained</td>
<td>47</td>
<td>73.4</td>
<td>73.4</td>
<td></td>
</tr>
<tr>
<td>Not trained</td>
<td>17</td>
<td>26.6</td>
<td>100</td>
<td></td>
</tr>
<tr>
<td><strong>Number of Pharmacy unit staffs</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>7</td>
<td>10.9</td>
<td>10.9</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>34.4</td>
<td>95.3</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>1</td>
<td>1.6</td>
<td>96.9</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>1</td>
<td>1.6</td>
<td>98.4</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>1</td>
<td>1.6</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

4.5. Availability of expired program drugs at SDPs

Among assessed SDPs there was no expired PD only at 4 (6.2%) SDPs and there was expired PD at 60 (93.8%) SDPs.
Table 2: availability of expired PDs at SDPs

<table>
<thead>
<tr>
<th>Availability of expired PDs</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Expired PDs available</td>
<td>60</td>
<td>93.8</td>
<td>93.8</td>
</tr>
<tr>
<td>Expired PDs not available</td>
<td>4</td>
<td>6.2</td>
<td>100.0</td>
</tr>
<tr>
<td>Total</td>
<td>64</td>
<td>100.0</td>
<td></td>
</tr>
</tbody>
</table>

4.6. Availability & usage of bin card at store

According to the SDPs’ store Assessment result of this thesis at 28 (43.8%) SDPs, program drugs bin card was available and updated in the store, while at 36 (56.2%) SDPs program drugs Bin card was not available or Updated.

Figure 3: Availability of Updated bin card at SDPs’ store. (Source: Bin card available in SDPs’ store (May 2017))

4.7. Availability & usage of bin card at Dispensaries

Among assessed 64 (100%) SDPs, Updated Bin Card was available at 22 (34.4%) SDPs’ dispensary and 42 (65.6%) SDPs were devoid of updated dispensary Bin card. This assessment was considered that bin card must available at least at one of SDPs’ dispensaries such as OPD pharmacy, Laboratory unit, Wards etc.
**Figure 4: availability of Updated Bin Card at SDPs’ dispensaries.**

Data Source: Bin card available in the one of SDPs’ dispensaries (May 2017)

### 4.8. Availability and Usage of IFRR by Dispensaries

There were 22 (34.4%) SDPs’ dispensaries that sent IFRR to the SDPs’ Pharmaceuticals store. All 22 SDPs dispensaries that were using bin card were sending IFRR to the store and the rest 42 (65.6%) SDPs’ dispensaries were not using IFRR

**Figure 5: Availability & usage of IFRR**

Data Source: IFRR filed in SDPs’ store (May 2017)
4.2. IFRR (Data) Quality

Among 22 IFRR user’s dispensaries only 19 (29.7%) were 29.7% sending quality IFRR data to respective store. While the remaining 3 (13.6%) of IFRR users sent poor quality IFRR as shown on figure 6.

![IFRR filled correctly](image)

**Figure 6: quality of IFRR data**

Source: SDPs’ IFRR documented by store keepers

4.9. RRF Reporting rate of SDPs

This variable was used to assess the implementation status of IMLS as indicator of IMLS performance, that mean it was not independent variable that affect implementation unlike other independent variables. As a result, from selected SDPs 53 (82.8%) were reported and the remaining 11 SDPs were not Reported during data collection period (May 2017). By using crosstabs analysis, it was found that 1 ART, 3 PMTCT and 7 Non PMTCT sites were not reported.
Figure 7: percentage of SDPs that sent RRF for two consecutive reporting periods

Source: List of SDPs that were sent RRF from PFSA SDPs RRF folder (May 2017)

4.10. Data (RRF) quality

When we say quality of LMIS report, it included validity, accuracy of calculation and timeliness of the report. Under this study, I classified quality f RRF based on Availability of selected tracers and accuracy of the calculation (each cell of RRF filled correctly). Result of the investigation shown that, 30 (46.9%) SDPs were reported Qualified bimonthly RRF report and the report of 21 (32.8%) SDPs was classified as poor data or report quality. The remaining 12 SDPs were not reported for selected tracers to assess the quality of this unreported SDPs report. To know the service type or facility types that were included among 12 SDPs unreported SDPs again crosstabs analysis was used and the result was shown on table. 18 ART, 8 PMTCT only and 4 Non- ART & Non-PMTCT SDPs had quality RRF Report and 3 ART, 8 PMTCT only and 11 4 Non- ART & Non-PMTCT SDPs had poor RRF quality. 1 ART, 3 PMTCT and 7 4 Non- ART & Non-PMTCT SDPs data was not available either they didn’t report the tracer drugs or RRF was not sent.

Therefore, to compare the prevalence of RRF quality which was the implementation status indicator, among the three SDPs service 18 ART SDPs, 8 PMTCT and 4 Non PMTCT SDPs had quality RRF. On the other hand, quality of 3 ART, 8 PMTCT and 11 Non PMTCT SDPs wasn’t good in quality and the rest 2 ART, 3 PMTC and 7 Non PMTCT sites’ data was not available since the RRF report was not found at PFSA.
Table 3: Crosstabulation of SDP type and Data(RRF) quality

<table>
<thead>
<tr>
<th>SDP type</th>
<th>Poor Quality RRF</th>
<th>Data Quality RRF</th>
<th>Unavailable</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART</td>
<td>18</td>
<td>3</td>
<td>1</td>
<td>23</td>
</tr>
<tr>
<td>PMTCT Only</td>
<td>8</td>
<td>8</td>
<td>3</td>
<td>19</td>
</tr>
<tr>
<td>Non-ART &amp; Non-PMTCT</td>
<td>4</td>
<td>11</td>
<td>7</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>22</td>
<td>12</td>
<td>64</td>
</tr>
</tbody>
</table>

Source: from SPSS fed data by crosstabs analysis (May 2017)

Figure 8: Quality of RRF data (Source: Observation of RRF sent to PFSA. May 2017)

4.11. LMIS training Modality

For question demanding LMIS training modality, 10 store keepers (15.6%) didn’t get LMIS training, 47 (73.4%) store keepers got training through workshop and 7 (10.9%) store keepers were self-trained.
4.12. Programs’ drugs stock status

As it was shown in the following table 4, the stock status of TB, Malaria, Family planning (FP) and ART drugs presented by using Stocked according to plan, over stock, under stock and Stock out rate indicators. 23 SDPs (35.9%), 19 SDPs (29.7%), 23 SDP (35.9%) and 13 SDPs (20.3%) had Normal (Stocked according to plan) Malaria, Family Planning, TB and ART tracer drugs selected by USAID respectively. Whereas, 16 SDPs (25%), 13 SDPs (20.3%), 12 SDPs (18.8%) and 3 SDPs (4.7%) SDPs had over stocked with Malaria, Family planning, TB and ART tracer drugs respectively. Similarly, 12 (18.8%), 23 (35.9%), 22 (34.5) and 8 (12.5%) SDPs were under stocked for Malaria, FP, TB and ART tracer drugs and 12 (18.8%), 9 (14.1%), 7 (10.9%) and 7 (10.9%) SDPs were stocked out for malaria, FP, TB and ART tracer products respectively. The malaria stock status of one (1.6%) SDP was not known and 33 (51.6%) SDPs had no ART tracer drug stock status information, due to some SDPs were Non-ART non PMTCT sites that were not expected to report ART drugs since ART drugs were not managed by such SDPs and some PMTCT and few ART SDPs stock status couldn’t determine since SDPs were not reported for selected ART tracer drugs.

As shown on table 5 exported from SPSS by using Crosstabs analysis, all 23 ART sites assessed for ART drugs stock status and among 33 unreported SDPs, 12 were PMTCT and all Non-ART & Non-PMTCT SDPs had not illegible for ART stock status assessment of ART drugs since either site were not managing ART products or didn’t report during this assessment period. To know the facility type of 33 non-reported, all hospitals were assessed and data was available, 12 PMTCT
and 21 Non-PMTCT service site SDPs’ were assessed for ART tracer drugs stock status since ART drugs were not managed by Non-PMTCT drugs and 12 PMTCT site SDPs’ were not reported the ART stock status due to Unknown reason.

Table 5: Tracer drugs stock status of East Wollega SDPs by service type

<table>
<thead>
<tr>
<th>SDPs service type</th>
<th>Normal</th>
<th>Over stock</th>
<th>Under Stock</th>
<th>Stock out</th>
<th>N/A</th>
<th>No. of assessed SDPs</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART</td>
<td>11</td>
<td>3</td>
<td>6</td>
<td>3</td>
<td>0</td>
<td>23</td>
</tr>
<tr>
<td>PMTCT Only</td>
<td>2</td>
<td>0</td>
<td>2</td>
<td>3</td>
<td>12</td>
<td>19</td>
</tr>
<tr>
<td>Non-ART &amp; Non-PMTCT</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>21</td>
<td>22</td>
</tr>
<tr>
<td>Total</td>
<td>13</td>
<td>3</td>
<td>8</td>
<td>7</td>
<td>33</td>
<td>64</td>
</tr>
</tbody>
</table>

Similarly, one SDP wasn’t reported the Malaria dugs stock status, as stipulated by WHO (2013) the stock out rate shouldn’t exceed

Table 6: stock status of PD (Malaria, FP, TB and ART)

<table>
<thead>
<tr>
<th>Programs</th>
<th>Status</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malaria Drugs stock status</td>
<td>Normal</td>
<td>23</td>
<td>35.9</td>
<td>35.9</td>
</tr>
<tr>
<td></td>
<td>Over stock</td>
<td>16</td>
<td>25</td>
<td>60.9</td>
</tr>
<tr>
<td></td>
<td>Under</td>
<td>12</td>
<td>18.8</td>
<td>79.7</td>
</tr>
<tr>
<td></td>
<td>Stock</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Stock out</td>
<td>12</td>
<td>18.8</td>
<td>98.4</td>
</tr>
<tr>
<td></td>
<td>N/A</td>
<td>1</td>
<td>1.6</td>
<td>100</td>
</tr>
<tr>
<td>Family planning drugs stock status</td>
<td>Normal</td>
<td>19</td>
<td>29.7</td>
<td>29.7</td>
</tr>
<tr>
<td></td>
<td>Over stock</td>
<td>13</td>
<td>20.3</td>
<td>50</td>
</tr>
<tr>
<td>TB drugs stock status</td>
<td>Normal</td>
<td>Under</td>
<td>Stock out</td>
<td></td>
</tr>
<tr>
<td>-----------------------</td>
<td>--------</td>
<td>-------</td>
<td>-----------</td>
<td></td>
</tr>
<tr>
<td></td>
<td>23</td>
<td>35.9</td>
<td>85.9</td>
<td></td>
</tr>
<tr>
<td>Over stock</td>
<td>12</td>
<td>18.8</td>
<td>54.7</td>
<td></td>
</tr>
<tr>
<td>Under Stock</td>
<td>22</td>
<td>34.4</td>
<td>89.1</td>
<td></td>
</tr>
<tr>
<td>Stock</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stock out</td>
<td>7</td>
<td>10.9</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ART drugs stock status</th>
<th>Normal</th>
<th>Over stock</th>
<th>Under Stock</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>13</td>
<td>3</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>20.3</td>
<td>4.7</td>
<td>12.5</td>
</tr>
<tr>
<td></td>
<td>20.3</td>
<td>25</td>
<td>37.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>64</td>
</tr>
<tr>
<td></td>
<td></td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>

Source: from RRF sent to PFSA May 2017

### 4.13. Frequency of RRF reporting

As it was shown on table all SDPs 64 (100%) sent their RRF report bimonthly directly to PFSA or to WoHo then to ZHD.

**Table 7: frequency of reporting period**

<table>
<thead>
<tr>
<th>Frequency of RRF report</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bimonthly</td>
<td>64</td>
<td>100.0</td>
<td>100.0</td>
</tr>
</tbody>
</table>
4.14. Type of software used to manage PDs

Similar question was administered to all SDPs to know the type of software used to manage PDs among the available software’s such as HCMIS, Rx, etc. and 9 SDPs (14.1%) were using HCMIS software and 55 (85.9%) SDPs were not using any software to manage their program stocks. Among SDPs that were using HCMIS 2 SDPs’ were not functional at it was shown on figure 11

Figure 10: Type of software used by SDPs (source Interview of Store keepers and Software observation (May 2017))

4.15. Functionality of software at the date of Visit

Figure 11: Functional status of Software (source: Store keepers interview and software observation)
4.16. Functions of software

During the assessment among Nine users of HCMIS, 6 SDPs used it to trace min-max of PDs, 7 SDPs were using the software to determine consumption, track expiry date and generate report. None of SDPs used HCMIS to do ABC analysis purpose.

Table 8: Function of Available stock management software

<table>
<thead>
<tr>
<th>Function of Software</th>
<th>% of SDPs</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>To trace Min-Max</td>
<td>SDPs used</td>
<td>6</td>
<td>9.4</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>SDs not using</td>
<td>58</td>
<td>90.6</td>
<td></td>
</tr>
<tr>
<td>To determine SDP consumption</td>
<td>SDPs used</td>
<td>7</td>
<td>10.9</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>SDs not using</td>
<td>57</td>
<td>89.1</td>
<td></td>
</tr>
<tr>
<td>To track Expiry of Program drugs</td>
<td>SDPs used</td>
<td>7</td>
<td>10.9</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>SDs not using</td>
<td>57</td>
<td>89.1</td>
<td></td>
</tr>
<tr>
<td>To generate SDP report</td>
<td>SDPs used</td>
<td>7</td>
<td>10.9</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>SDs not using</td>
<td>57</td>
<td>89.1</td>
<td></td>
</tr>
<tr>
<td>To conduct ABC analysis</td>
<td>SDPs used</td>
<td>0</td>
<td>0</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>SDs not using</td>
<td>64</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

Source: Interview of store keepers and observation of applicability of software (May 2017)
4.17. Supportive Supervision Access of SDPs

Regarding IPLS supportive supervision access, 50 SDPs (78.1%) were received external supportive supervision and 14 SDPs were never got supervision during the last three months.

![Supportive supervision access of SDPs](image)

**Figure 12:** SDPs Access to IPLS supportive Supervision within last three months (Source: interviewing of store keepers and observation of available feedback (May 2017))
4.18. Frequency of External Supervision Access by SDPs within last 3 months

Among 50 supervised SDPS 10 get supportive supervision every monthly, 13 SDPs bimonthly, 25 quarterly and 2 SDPs semiannually. The frequency of supervision varied based on the distance SDPs placed from PFSA. According to this study finding the nearest SDP from PFSA had more frequent Supportive supervision access than the farthest. And frequency of supervision was also varied based on SDPs service type. ART site got more frequent supervision than PMTCT and non-PMTCT, and PMTCT got better supportive supervision than non-PMTCT.

![Frequency of external Supportive supervision access](image)

Figure 13: Frequency of external IPLS supportive supervisors (source: Store keepers interview (May 2017))

4.19. Supervisory Body

Among the listed supervising bodies, 11SDPs were supervised by PFSA, 6 SDPs were supervised by RHB 28 SDP by ZHD and 5 SDPs were supervised by NGO. The rest 14 never got IPLS supervision within the last 3 months.
Figure 14: Number of SDPs received IPLS supervision by different external Supervisory body during last 3 months.

4.20. Activities done by supervisors (e.g., bin cards checked, logistics reports checked, storage conditions checked, etc.)

Among 50 SDPs who received IPLS supportive supervision all supervisors checked bin cards, saw logistics reports such as RRF, inspected storage condition and gave feedback as it was shown on figure 15 to supervised SDPs.

Figure 15: check list of external supervisors (source: store keepers interview and observation of copy of signed feedback)
### 4.21. Supervisors Feedback

![Status of feedback chart]

Figure 16: Percentage of SDPs received feedback from supervisors (Source: Store keepers interview and observation given feedback (May 2017))

### 4.22. Distribution Modality

It was found that 35 SDPS were receiving PD by direct distribution modality from PFSA and other 29 were supplied indirectly by WoHo pass through. Again, to the study tried to see the lead time for WoHo pass through and direct delivery SDPs. As a results, supplied directly from PFSA had shorter lead time than those supplied indirectly through WoHo.

![SDPs Distribution Modality chart]

Figure 17: SDPs’ Distribution modalities (Source: Observation of Nekemte distribution modality list and interview of SDPs’ store keepers. May 2017)
### 4.23. Internal Factors

**Table 9: Internal factors**

<table>
<thead>
<tr>
<th>Availability of Committed staff</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Committed staff</td>
<td>29</td>
<td>45.3</td>
<td>45.3</td>
</tr>
<tr>
<td>No Committed staff</td>
<td>35</td>
<td>54.7</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Availability of Management support</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good management support</td>
<td>23</td>
<td>35.9</td>
<td>35.9</td>
</tr>
<tr>
<td>Poor management support</td>
<td>41</td>
<td>64.1</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Budget allocation for SDPs PD management</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allocated</td>
<td>6</td>
<td>9.4</td>
<td>9.4</td>
</tr>
<tr>
<td>Not allocated</td>
<td>58</td>
<td>90.6</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Store keepers and PFSA forecasting & capacity building coordinator interview and personal observation (May 2017)
4.24. **Number of emergency orders SDPs placed during the last 3 months**

Among the presented options on the assessment data collection tool regarding emergency orders SDPs placed during the last three months, 33 SDPs were not placed emergency order, 25 SDPs placed one emergency order and 6 SDPs placed 2 emergency orders for Program drugs. The numbers of emergency orders were selected to measure the IPLS implementation in this study, because one of the purpose of IPLS was to reduce number of emergency orders.

![Number of Emergency order during last 3 months](image)

**Figure 18: Number of emergency orders place by SDPs**

4.25. **Facilities that have 100% order fill rate**

All the response received from store keepers and by comparing the ordered amount from RRF and quantity delivered from STV all the requested PDs delivered 100%.
**Figure 19: number SDPs that received the requested PD amount (Source: SDPs STV and RRF (May 2017))**

### 4.26. Lead time of PD

For the question that assessed the time elapse between RRF requisition date and ordered PD receiving date, 29 SDPs received PD within 2 weeks and 4 weeks, 35 SDPs received between 4 weeks and 5 weeks after RRF requisition. Most of SDPs were WoHo pass through distribution modality. All 29 SDPs with indirect and only 6 direct delivery systems had between 4 and 5 weeks leads time as shown below.

**Table 9: Lead time of Direct and indirect distribution modality SDPs**

<table>
<thead>
<tr>
<th>Distribution Modality</th>
<th>Lead time of PD</th>
<th></th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct</td>
<td>2 week to 1 month</td>
<td></td>
<td>35</td>
</tr>
<tr>
<td>Indirect</td>
<td>29</td>
<td>Between 1 month to 5 weeks</td>
<td>29</td>
</tr>
</tbody>
</table>

43
Source: Crosstabs analysis from SPSS fed data. May 2017

Figure 20: Lead time of SDPs (Source: SDPs Reported and Received date from RRF and Model 19 and store keeper interview. May 2017)

4.27. SDPs Internal factors

In this study three factors: pharmacy unit staff commitment, management support and budget allocation for PDs stock management. As a result, 23 SDPs (35.9%) of 64 assessed SDPs had good management support for proper management of PDs, 29 (45.3%) SDPs had committed pharmacy staff and only 6 SDPs had budget for PDs management.
<table>
<thead>
<tr>
<th>Availability of Committed staff</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Committed staff</td>
<td>29</td>
<td>45.3</td>
<td>45.3</td>
</tr>
<tr>
<td>No Committed staff</td>
<td>35</td>
<td>54.7</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Availability of Management support</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good management support</td>
<td>23</td>
<td>35.9</td>
<td>35.9</td>
</tr>
<tr>
<td>Poor management support</td>
<td>41</td>
<td>64.1</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Budget allocation for SDPs PD management</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allocated</td>
<td>6</td>
<td>9.4</td>
<td>9.4</td>
</tr>
<tr>
<td>Not allocated</td>
<td>58</td>
<td>90.6</td>
<td>100</td>
</tr>
</tbody>
</table>

Source: Store keepers and PFSA forecasting & capacity building coordinator interview and personal observation (May 2017)
4.28. SDPs storage space and shelving status

According to health Logistic newspaper published by USAID/DELIVER (2012) “Suitable storage conditions are essential when implementing a successful IMLS. Facilities that lack adequate space or proper shelving cannot organize their pharmaceuticals and medical supplies, or store them correctly”. This newspaper also spoke that“most public health facilities, the storerooms are too small to hold all the medicines and medical supplies they need. In addition, many health facilities lack storage spaces for other equipment, which means these are often stored in the space dedicated for medicines”.

As assessment result of this study regarding storage space and shelving facility shown on the following graph 34 (53.1%) of the totally assessed SDPs had enough storage space and shelving materials, while the rest 30 (46.9%) SDPs had small storage space and poor shelving materials.

![Storage space and shelving status](image)

**Figure 21: availability of enough shelving and storage at SDPs’ stores (source: observation of storage space and shelving of SDPs store)**

4.29. IMLS Implementation

As it was stated before the Implementation of IMLS was defined based of the values of indicators such as lead time, number of Emergency orders, stock according to plan etc. Accordingly, only 21
SDPs (32.8%) implemented IPLS and 43 SDPs (67.2%) didn’t fulfill the settled criteria. Therefore, the prevalence of IPLS implementation was 32.8%.

Table 11: IPLS prevalence of SDPs

<table>
<thead>
<tr>
<th>Times n</th>
<th>Frequency</th>
<th>Percent</th>
<th>Cumulative Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPLS Implemented</td>
<td>21</td>
<td>32.8</td>
<td>32.8</td>
</tr>
<tr>
<td>IPLS not Implemented</td>
<td>43</td>
<td>67.2</td>
<td>100</td>
</tr>
</tbody>
</table>

4.30. Associated factors

Bivariate logistic regression was done for every independent variable included in this study with the dependent variable IPPLS implementation which was the aggregated result of indicators. Based on the bivariate logistic regression; SDPs’ service type, experience of store keepers, profession of store keepers, age of store keepers, availability and usage of BIN cards both at store and dispensary, availability and usage of IFRR at least at one dispensary unit in the SDP, the facility type, type of software used for managing program drugs, access of external supportive supervision and frequency of supportive supervision found to be crude factors for proper implementation of IPLS in the area and analyzed using bivariate logistic regression.

As per the result from bivariate logistic regression, being PMTCT service typewas about sixty-five folds retards the implement of IPLS [\textit{COR} = 64.8 & lower and upper bound (6.87 – 611.27), \textit{P-value} = 0.000] or IPLS implementation was better in ART sit SDPs than PMTCT sites. Having experience of 2 – 5 years for store managers is by 88.4% more better to implement when it is compared with having experience of 0 – 2 [\textit{COR} = 0.116 (0.023 – 0.59), \textit{P-Value} = 0.009] more experienced professional implemented IPLS more than less experienced professionals. Similarly, SDPs’ stores managed by pharmacist found to be better for implementation of IPLS than druggist by 11 folds and nurses/HO by 44 folds. The same fashion was applied for other variables listed as independent variables as it was shown on table 11.

As shown on table 11 the P-value of at least one case of the variable was less than 0.005 and the lower and upper bounds never crossed the line at number one. In this study, the implementation of IPLS was positive word and if both the upper and lower bounds found below 1 for one case it affects negatively and if it both lower and upper bounds were above 1 for at least one case we called
the variable affects IPLS implementation positively. Whereas, lower bound found below and upper bound above 1, there was no association between dependent and independent variables

**Table 11: Crude factors of IPLS implementation at East Wollega, Oromia, Ethiopia, 2017.**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Values</th>
<th>P-value</th>
<th>COR</th>
<th>Lower</th>
<th>Upper</th>
</tr>
</thead>
<tbody>
<tr>
<td>ART</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PMTCT</td>
<td>0.000</td>
<td>64.8</td>
<td>6.87</td>
<td>611.27</td>
<td></td>
</tr>
<tr>
<td>SDP Service type</td>
<td>Non-PMTCT</td>
<td>0.000</td>
<td>36</td>
<td>6.199</td>
<td>209.064</td>
</tr>
<tr>
<td></td>
<td>0 – 2</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Experience of store keeper</td>
<td>2–5</td>
<td>0.009</td>
<td>0.116</td>
<td>0.023</td>
<td>0.59</td>
</tr>
<tr>
<td></td>
<td>5–10</td>
<td>0.001</td>
<td>0.037</td>
<td>0.005</td>
<td>0.27</td>
</tr>
<tr>
<td></td>
<td>&gt;10</td>
<td>1</td>
<td>1.41E+08</td>
<td>0</td>
<td>.</td>
</tr>
<tr>
<td>Profession of store keeper</td>
<td>Pharmacist</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Druggist</td>
<td>0.003</td>
<td>10.286</td>
<td>2.211</td>
<td>47.842</td>
</tr>
<tr>
<td></td>
<td>Nurse/HO</td>
<td>0.000</td>
<td>44</td>
<td>6.435</td>
<td>300.869</td>
</tr>
<tr>
<td>Availability and usage of</td>
<td>Available</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIN cards at store</td>
<td>Not available</td>
<td>0.000</td>
<td>87.5</td>
<td>10.19</td>
<td>751.345</td>
</tr>
<tr>
<td>Age of store keeper</td>
<td>20 – 30</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>31–40</td>
<td>0.067</td>
<td>0.222</td>
<td>0.044</td>
<td>1.11</td>
</tr>
<tr>
<td></td>
<td>41–50</td>
<td>0.032</td>
<td>0.1</td>
<td>0.012</td>
<td>0.818</td>
</tr>
<tr>
<td>Availability and usage of</td>
<td>Available</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIN cards dispensary</td>
<td>Not available</td>
<td>0.000</td>
<td>126.667</td>
<td>19.509</td>
<td>822.408</td>
</tr>
<tr>
<td>Availability and usage of</td>
<td>Available</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IFRRs in the facility</td>
<td>Not available</td>
<td>0.000</td>
<td>126.667</td>
<td>19.509</td>
<td>822.408</td>
</tr>
<tr>
<td>Type of software used for</td>
<td>HCMIS</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>program drugs</td>
<td>No software is used</td>
<td>0.007</td>
<td>10.25</td>
<td>1.902</td>
<td>55.246</td>
</tr>
<tr>
<td>Access for external supportive supervision</td>
<td>Accessed</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td>---</td>
<td></td>
</tr>
<tr>
<td>not accessed</td>
<td>0.045</td>
<td>8.667</td>
<td>1.049</td>
<td>71.569</td>
<td></td>
</tr>
<tr>
<td>Frequency of supportive supervision</td>
<td>Monthly</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bimonthly</td>
<td>0.027</td>
<td>9</td>
<td>1.285</td>
<td>63.025</td>
<td></td>
</tr>
<tr>
<td>Quarterly</td>
<td>0.017</td>
<td>8.5</td>
<td>1.458</td>
<td>49.539</td>
<td></td>
</tr>
<tr>
<td>Semi-annually</td>
<td>0.999</td>
<td>6.46E09</td>
<td>0</td>
<td>.</td>
<td></td>
</tr>
<tr>
<td>Distribution modality</td>
<td>Direct delivery</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Woreda through delivery</td>
<td>0.001</td>
<td>16.031</td>
<td>3.293</td>
<td>78.05</td>
<td></td>
</tr>
</tbody>
</table>

Source: Bivariate logistic regression (May 2017)

All factors which have p-value less than 0.05 by bivariate logistic regression was subjected to multivariate logistic regression and their aggregated association with IPLS implementation was seen. With this, profession of the store managers, availability and usage of BIN cards at store, accessing supportive supervision and frequency of supportive supervision were found to be strongly associated with implementation of IPLS after multivariate analysis and the effect of others was cancelled by other variables.

As compared to pharmacists, being druggist managing facilities store is about ten times less likely to implement IPLS [\(AOR = 10.346 (4.719 - 37.362), P-value = 0.001\)] where as being nurse or health officer as a store manager is by twenty-seven times less likely to implement IPLS in health facilities [\(AOR = 27 (4.356 - 78.254), P-value = 0.000\)].

Not having and using BIN cards in store is about twenty-three times less likely to implement IPLS [\(AOR = 23.372 (9.117 - 29.427), P-value = 0.000\)].

### Table 12: Factors associated with implementation of IPLS in East Wollega zone, Oromia, Ethiopia, 2017

<table>
<thead>
<tr>
<th>Variables</th>
<th>Values</th>
<th>P-value</th>
<th>COR</th>
<th>AOR</th>
<th>Lower</th>
<th>Upper</th>
</tr>
</thead>
</table>

95% CI
<table>
<thead>
<tr>
<th>Profession of store keeper</th>
<th>Pharmacist</th>
<th>Druggist</th>
<th>Nurse/HO</th>
<th>0.001</th>
<th>10.286</th>
<th>10.346</th>
<th>4.719</th>
<th>37.362</th>
</tr>
</thead>
<tbody>
<tr>
<td>Availability and usage of BIN cards at store</td>
<td>Available</td>
<td>1</td>
<td>Not available</td>
<td>0.000</td>
<td>44</td>
<td>27</td>
<td>4.356</td>
<td>78.254</td>
</tr>
<tr>
<td>Access for external supportive supervision</td>
<td>Accessed</td>
<td>1</td>
<td>1</td>
<td>0.005</td>
<td>8.667</td>
<td>4.954</td>
<td>4.107</td>
<td>45.713</td>
</tr>
<tr>
<td>Frequency of supportive supervision</td>
<td>Monthly</td>
<td>1</td>
<td></td>
<td>0.000</td>
<td>9</td>
<td>6.18</td>
<td>3.583</td>
<td>30.625</td>
</tr>
<tr>
<td></td>
<td>Bimonthly</td>
<td></td>
<td></td>
<td>0.002</td>
<td>8.5</td>
<td>3.54</td>
<td>8.514</td>
<td>35.628</td>
</tr>
<tr>
<td></td>
<td>Quarterly</td>
<td></td>
<td></td>
<td>Semi-annually</td>
<td>0.626</td>
<td>6.46E+09</td>
<td>4.28E+02</td>
<td>0.785</td>
</tr>
</tbody>
</table>

Source: Multivariate logistic regression (May 2017)
Chapter Five

5. Discussion, concussion and recommendations

5.1. Discussion

In this study, Implementation of IMLS was assessed at 64 East Wollega public health facilities out of 66 planned facilities with 97% response rate. At all SDPs store keepers were interviewed with some observation data collection methods employed. The collected data was keyed into excel sheet to check the validity, visibility, accuracy and correctness of data and the exported to SPSS 16 for analysis.

The study done at 64 SDPs was targeted to gather information related with store keepers’ demographic characteristic such as age, sex, experience, profession and qualification, IMLS training status. Then it was known that Logistic reports move data up and down through the supply chain and help in decision making. To facilitate correct and consistent reporting and resupply within the facility and among the different levels in the health supply chain, IMLS introduced the IFRR, HPMRR, and RRF. Hospitals and health centers use the RRF to report their consumption and to request the resupply quantity every two months. It was found that accounts 71.9% of store keepers and the mean age was 38 years with standard deviation of 0.597. The mean experience was 4 years with standard deviation of 0.76. and the store of 15 studied SDPs managed by pharmacist, 25 by druggists and 24 SDPs stores managed by none-pharmacy professional such as nurse or health officer (HO) which is smaller than a research done in Tanzania (25% of store keepers were nurses/other non-pharmacy profession) by Richard (2011) on antimalaria drugs management. Among 64 SDPs’ store keepers only 47 (73.9%) trained with IMLS which was high than the percentage of IMLS trained store keeper research done in Tanzania which was 54.5% 18 professionals out of 33 (Gibson et al, 2013).

IMLS SOP manual (2015) dictated that one of the purposes of IMLS was expiry or wastage reduction. But in this study, it was found that 60 (93.8%) SDPs had stored considerable amount of pharmaceuticals waste. In addition to this the facility type, SDPs service type and their distance from resupplying agent (PFSA) was assessed and there were 3 public hospitals and 63 public health
centers and among these SDPs 23 were ART site, 20 PMTCT and 23 None-ART &None-PMTCT site. The mean distance from PFSA was found to be 87 km with 0.957 standard deviation.

By using Bivariate logistics regression, it was found that ART site were better in the implementation of IPLS than PMTCT sites \((COR= 64.8 & lower and upper bound (6.87 – 611.27), P-value= 0.000)\).

According to this study Distance from resupplying agent and facility type had no association with IPLS implementation. Because their p-value was greater than 0.005 and the lower and upper bound crossed number 1. The other variables tested under this study the availability and usage LMIS formats such as bin card at store and dispensaries, IFRR and RRF together with their data quality. As it was stated by IPLS Sop manual (2015) the purpose of LMIS was to collect, organize, and report information to other level body to make decision that governs the logistic system and ensure all six rights are fulfilled for each client. As a result, LMIS records must be quality to give the three essential logistic data such as stock on hand, consumption and loss and adjustment. Bin card was available and updated at 28 (43.8%) SDPs store and 22 (34.4%) dispensaries and all 22 (34.4%) bin card users’ dispensaries sent IFRR to store, among 22 sent IFRR only 19 had good quality which was lower than the research done by Alemwork (2014) Addis Ababa public SDPs on ART and TB laboratory logistic assessment (74%).

In this study the Stock status of 36 selected tracer drugs selected from malaria (four types of coartems and rapid test kit (RTD) ), FP (condom, implanon, IUCD, microgynon, min pill, emergency pill and Depo provera), TB (RHZE kit, Ethambutol 100mg and streptomycin) and ART (Atazanavir/ritonavir, tenofovir/lamivudine/nevirapine adult and zidovudine/lamivudine/nevirapine pediatric) were assessed using four indicators such as stock according to plan if the months of stock lay between 2 and 4 months, under stock of months of stock is less than 2 months and over stock if months of stock is greater than 4 months and stock out if the tracer is not available for more than three days in facility including dispensaries.

Depending on the understanding in this study assesses23 SDPs (35.9%), 19 SDPs (29.7%), 23 SDP (35.9%) and 13 SDPs (20.3%) had Normal (Stocked according to plan) of Malaria, Family Planning, TB and ART tracer drugs selected by USAID respectively. Whereas, 16 SDPs (25%), 13 SDPs (20.3%), 12 SDPs (18.8%) and3 SDPs (4.7%) SDPs had over stocked with Malaria,
Family planning, TB and ART tracer drugs respectively. Similarly, 12 (18.8%), 23 (35.9 %), 22 (34.5) and 8 (12.5%) SDPs were under stocked for Malaria, FP, TB and ART tracer drugs and 12 (18.8%), 9 (14.1%), 7 (10.9%) and 7 (10.9%) SDPs were stocked out for malaria, FP, TB and ART tracer products respectively. The malaria stock status of one (1.6%) SDP was not known and 33 (51.6%) SDPs had no ART tracer drug stock status information, due to some SDPs were Non-ART non PMTCT sites that were not expected to report ART drugs since ART drugs were not managed by such SDPs and some PMTCT and few ART SDPs stock status couldn’t determine since SDPs were not reported for selected ART tracer drugs.

Generally, for selected independent variable their association with dependent variable IPLS implementation was seen and only SDP type, store keepers experience, profession of store keepers, availability and usage of bin card at store and dispensary, age of store keepers, availability and usage of IFRR, type of software used for PDs management, external supportive supervision and frequency of supervision and distribution modality had association with IPLS implementation by using bivariate logistics regression (COR, P-value and lower and upper bounds).

The associated variables were also subjected to multivariate analysis to select the variable that truly affect IPLS implementation and found that, profession of store keepers, availability and usage of bin card, external supportive supervision access and frequency were variable that must be given due attention to implement IPLS in this research

5.2. Conclusion

IPLS was implemented by 32.8% which was minimum. And association was made to identify variable the were factor for implementation and found that store must be managed by pharmacy profession (pharmacist or druggist), Access of frequent external supportive supervision must be in placed to improve implementation status. The quality of LMIS data such as updating bin card and usage of IFRR found to be a factor for IPLS implementation. Indicators such as stock out rate, over stock, under stock and stock according to plan showed there was limited amounts of SDPs that held normal stock of PDs (23 SDPs (35.9%), 19 SDPs (29.7%), 23 SDP (35.9%) and 13 SDPs (20.3%) had Normal (Stocked according to plan) Malaria, Family Planning, TB and ART tracer drugs selected by USAID).
5.3. Recommendation

All concerned partners (NGOs) need to work together and advocate for standardized and adequate storage room for pharmaceuticals and medical supplies. The FMOH, Oromia RHB also needs to pay attention to the design, size and Shelving of the storeroom at the facilities level.

It was shown that facilities that are supported for relatively more frequently showed better implementation performance than those that only receive limited support. However, partners cannot continue supporting the same sites while new sites have never received support. Strategies, including graduation of matured facilities, should be designed to shift resources and support to including newer health centers (Non-ART non-PMTCT sites).

PFSA have done a great job with direct delivery: but, indirectly resupplied facilities were performing less compared to direct delivery since they are not getting supportive supervision and the lead time was also longer. System must be in placed to reduce the lead time at least less than 4 weeks

The supply chain members found in this system must give due attention specially for profession of store keepers, supportive supervision access and frequency and LMIS data quality and standardization of Integrated RRF format.
6. References


Desalegn T, 2015. The study of Ethiopian public health supply chain management: before and after pharmaceutical fund and supply agency.


EPHI, (2013). Guidelines for the implementation of point-of-care CD4 testing technology in Ethiopia.


7. Data Collection Instrument (Attach it as an appendix)

“Good day. My name is ___________. I am working with the research team of the Department of Logistics and Supply Chain management, School of Commerce, Addis Ababa University. I am here to collect data about the implementation status of integrated Pharmaceutical logistics System at your facility that is needed for the Master’s Thesis titled “Assessment of Integrated Pharmaceutical Logistics System in Public health facilities at East Wollega Zone”.

This survey is done in all public health centers and Hospitals found in the Zone. Your facility is selected because it is one of them. The research will provide an empirical snapshot of the current pharmaceutical logistics situation at all health care level in East Wollega Zone and provide baseline information to track changes and improvements in pharmaceutical logistics performance over time.

I would like to ask you few questions about availability of selected program drugs, your educational background and experience in the area, and the functioning of Logistics Management Information System (LMIS). In addition, I would like to check these program drugs you have in stock today and observe the general storage and storage conditions. The interview will take 10-15 minutes of your time.

Your participation is completely voluntary. You can refuse to answer any questions and/or withdraw from the study at any time. All of the information collected is strictly confidential. No one other than the research team will have access to your responses. Your personal identifiers such as your name and that of your health facility will not be used. The principal investigator will not refer to individual respondents or individual facilities in the report, but rather will describe the overall picture of all facilities.

Do I have your permission?
Yes___________ No_____________. If Yes, Continue

• For comments/questions please contact Getachew Nigusie (0911035643), principal investigator for the study.
I. Facility Identification

1.1. Health facility code
1.2. Interviewer:
1.3. Date of Visit
1.4. Name of the facility
1.5. Facility Address: Region Zone Woreda Supplying PFSA Hub
1.6. Type of facility

PFSA hub------------------1
Hospital ------------------2
Health center-----------------3
NGO/Private----------------4

1.7. Distance from usual resupply point in Km. 1, Less than 10km, 2, 10km to 50km. 3, 50km to 100km. 4, 100km to 200km. 5, Above 200km
1.8. Facilities Service type: ART---------1, PMTCT only------2, Non-PMTCT None-----3

II. Interviewee(Response)Information

1.1. Name: ________________
1.2. Title: __________________
1.3. Mobile number: ____________
1.4. Sex: Male-------------1, Female------------------2
1.5. Age: Less than 24----1, 24-34--------2, 34-45--------3, more than 45
1.6. Number of years you have worked at this facility?
   0-1year-------1, 2-5years------2, 5-10years------------3, Above 10----------------4
1.7. What is your profession? Pharmacist--------1, Druggist---------2, Nurse/HO------3
1.8. Have you heard about IPLS before? Yes----------1, No----------------2
1.9. Have you trained in IPLS? Yes----------------1, No--------------------------2

II. Availability of Program drugs (PDs)

2.1. Are there certain PDs that you often stock out of before recent resupply?
   Yes ............1 No...................0 If No skip to 2.3
2.2. List the PDs (including the dosage form and strength) you stock out of most frequently (up to 5 products).
   i________________________
   ii_______________________
   iii_______________________
   iv_______________________

2.3. Do you often have a overstock of certain PDs before resupply?
   Yes ............1 No..................0 if No Skip to 3.1

2.4. List the PDs you have overstocked of most frequently (up to 5 products).
   i________________________
   ii_______________________
   iii_______________________
   iv_______________________

2.6. Is there expired PD right now? Yes----------------1, No--------------------------2

2.7. What is the value of expired drugs? -------------------birr

III. Pharmaceutical Logistics Management Information System

3.1. Do you apply Integrated Logistics System (ILS) in your drug store? a)Yes ----- 1 b) No--

3.2. Do you use and fill out the following logistics forms to manage PDs?
   A. bin cards (in store) Yes ..........1 No ..............0
   B. bin cards (in dispensary units) Yes ..........1 No ..............0
   C. Internal facility report and requisition form (IFRR) Yes ..........1 No ..............0
      - Does all Cells of the dispensary report Form (IFRR) properly filled?
        yes ..........1 No ..............0
   D. Reporting and resupply form (RRF) Yes ..........1 No ..............0
      - Does all Cells of the report Form (RRF) properly filled?
        yes ..........1 No ..............0

3.3. How did you learn to complete logistics forms/records used at this facility? (Circle that all apply)
   Never learned..................................A
During a logistics workshop ..........................B  
On-the-job training ....................................... C  
On-the-job (self-learning) ............................. D

3.4. To whom the RRF report is sent?  
PFSA-------------1, ZHD---------------2, WHO-------------3, RHB------------------4

3.5. Does the RRF contains the following ART Drugs? Yes ........1 No ...............0

3.6. Does the RRF contains the following other PDs Drugs? Yes ........1 No ...............0

3.7. How often is the RRF for PDs sent to Supplier like PFSA?  
Monthly...............................................1  
Bimonthly .............................................2  
Every 4 months ......................................3  
Never sent............................................4

3.8. What computer software system do you use to manage PDs in the store?  
HCMIS ..................................................1  
RX solution ..........................................2  
Don’t use software .................................3  
Other (Specify) __________________________9 If 3, skip to 4.17

4.18. Is the software functional at this time? Yes ........1 No ...............0 If yes, skip to 4.20

4.19. How long the software has become not functional?  
Less than 1 week ..................................1  
About 2 weeks .................................2

About 3 weeks ......................................3  
About 1 month ..................................4  
More than 1 month ...........................5

4.20. For what functions do you use the software?  
A. To trace stock level (Min-max) Yes ..........1 No ...............0
B. To determine consumption Yes ............1 No ..................0

C. To trace expiry date Yes ............1 No ..................0

D. Prepare report? Ye----------------1, No------------------2

E. To conduct ABC analysis Yes ............1 No ..................2

V. Supportive Supervision

5.1. Have you get external supportive supervision regarding IPLS before? Yes--------1 No------2
If yes continue

5.2. Approximately, how often you get supportive supervision on IPLS mostly

Never get supportive supervision .................1

Monthly.................................................................2

Bimonthly ..............................................................3

Quarterly ...............................................................4

Every 4 months .....................................................5

5.3. Where do the supervisors come from?

PFSA-----------------------------1

RHB-----------------------------2

ZHD-----------------------------3

NGO-----------------------------4

Another (specify)------------------------5

5.5. Did your last supervision visit include drug management/logistics (e.g., bin cards checked, logistics reports checked, storage conditions checked, etc.)? Yes--------1, No -------2

5.6. Did they give they provide feedback? Yes--------1 No--------0
VI. Distribution and Transportation

1. **Product Delivery Modalities from PFSA, Direct--------1, Indirect---------2**

2. How many emergency orders have you placed in the last 3 months? If available, ask for documents to verify using RRF
   - None ...................................................... 0
   - 1 ......................................................... 1
   - 2 ......................................................... 2
   - 3 ......................................................... 3
   - More than 3.................................4

3. Who determines this facility’s resupply quantities? Multiple responses are possible.
   - The facility itself ................................................................. A
   - Higher-level facility (Health Center, PFSA/Woreda/Zone/RHB) ..................... B
   - Other ........................................................................ W

4. What are the direct sources of supply for program commodities (ART, TB, Malaria and FP) at this facility? Multiple responses are possible.
   - PFSA..................................................A
   - RHB.................................................B
   - FMOH-----------------------------------C
   - ZHD..............................................D
   - WHO............................................E

5. On average, for a normal order approximately how long does it take between sending an order and receiving product from main resupply point?
   - Less than 2 weeks ......................... 1
   - 2 weeks to 1 month ......................... 2
   - 1 month to 5 weeks ......................... 3
   - Between 5 weeks to 8 weeks ............ 4
6. Who is responsible for transporting program products to your facility? Multiple responses are possible.

PFSA……………………………………..A

ZHD……………………………………..C

Facility itself--------------------------------E

Woreda…………………………………D

RHB……………………………………..B

8. Is there committed staff at Health facility? Yes----------1, No…………………2

9. Do you have good management support affect IPLS implementation? Yes………………1, No……………………………………2

10. Does Health facility has Budget to manage program drugs?

Yes----------------------1, No-----------------------------2

Comment__________________________________________________________________________
__________________________________________________________________________