FACTORS INFLUENCING EFFECTIVENESS OF THE VIRAL LOAD MONITORING SYSTEM IN HIV PROGRAMS: A COMPARATIVE STUDY OF THE COPTIC HOPE CENTER AND LEA TOTO HIV PROJECTS IN KENYA

BY

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DECLARATION

This research project is my original work and has not been submitted for an award of degree in this or any other university.

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DEDICATION

I would like to dedicate this project to my dear wife, Janet Ngomoa and my beautiful daughter Wendy Ngomoa for their unwavering moral support throughout the period of conducting and compiling the study.

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First, I wish to thank the Almighty God for granting me good health and sound mind that enabled me to work through the completion of this research project.

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ABSTRACT

In Kenya, there has been a recent scale-up of the M&E systems among the HIV programs in response to increasing donor demands to provide quality data for both programs and patient monitoring. There exist gaps in enhancing the existing monitoring systems to effectively generate reliable data that can be used for viral load monitoring. This study assessed factors associated with an effective viral load monitoring system in HIV programs, a comparative study of the Coptic Hope Center and the Lea Toto programs. The study adopted a cross-sectional study design with a representative sample of 36 respondents in each program. Both qualitative and quantitative data were collected on the various components of viral load monitoring system and a review of the existence of all components of viral load monitoring system was done.

The findings revealed that the method used for viral load data collection has an influence on the effectiveness of the viral load monitoring system. The Coptic Hope Center had a well elaborate electronic medical record system, which was more efficient and relatively easy to use. Such a system generates accurate data while encouraging the use of data for decision-making. The Lea Toto program, on the other hand, used patient files and viral load registers, which were voluminous; a result of filling a questionnaire for every session a patient has with the service provider. Such a system was noted to contribute to inaccurate data while discouraging the use of data generated for decision making. The study further noted the absence of improvement plans on the monitoring gaps singled out by viral load data support supervision activities in both programs. This undermined the very benefit of data support supervision of helping build the capacity of staff collecting the viral load data and by extension, improving on the quality of the data collected. The study further observed that the different methods of disseminating the viral load data downwards affect utilization and hence the effectiveness of viral load monitoring system.

Though a majority of the staff in both programs mostly uses the viral load data for the viral load related decisions, a sizeable proportion of staff at the Lea Toto program does not always rely on the viral load data to make decisions due to limited involvement in the use of data for the decision-making process.

The study recommends that programs should adopt a simplified electronic viral load monitoring system that makes it easier for the end users to navigate through different modules and allows service providers to generate accurate viral load reports at a point of care. Further supportive supervision of the viral load data, accompanied by an elaborate improvement plan, should be an integral part of the viral load monitoring system. Further, programs need to strengthen stakeholder involvement in decision-making, which may enhance demand for data. Finally, it is therefore important to ensure there is an effective protocol to ensure that inaccurate data is corrected in a timely manner.

CHAPTER ONE: INTRODUCTION

1.1 Background

Globally, the rapid scale-up of HIV/AIDS interventions in recent years has necessitated for effective monitoring and evaluation (M&E). M&E is gradually becoming a key component in the provision of HIV services. M&E provides data to inform HIV programs while providing guidance on the provision of better packages for prevention services and improved care and treatment of HIV-infected patients (Halmshaw and Hawkins 2011).

Monitoring and evaluation are distinct but complementary processes. Both are dedicated to assessing the overall performance of a program. While monitoring involves a continuous process of data collection and measurement of progress toward program objectives, evaluation is a time-bound exercise. It is undertaken to determine whether a program has achieved its goals and delivered what was expected according to its original plan (World Bank 2004).

In Kenya, there has been a recent scale-up of M&E systems among the HIV programs in response to the ever-increasing donor demands to provide quality data for both programs and patient monitoring (Karani et al., 2014). In order to improve patient monitoring processes, there is a need to strengthen the existing monitoring systems for HIV programs. This requires addressing not just the technology related to the collection of data, but also the wider monitoring context including data needs, data processing and the utilization of the generated information for improving patient outcomes (Nash et al., 2009).

The Ministry of Health and donors in Kenya have collectively advanced the Health Information System (HIS) that seeks to generate quality data for use to establish and promote a culture of

continuous patient improvement practices. They have supported efforts through funding and technical capacity to improve data quality and use through the development of the District Health Information System (DHIS) (George 2010). DHIS is an open source software platform used by various HIV programs for analysis, reporting, and dissemination of healthcare data. DHIS has reduced the complexity of reporting among HIV programs. It has also allowed HIV programs to monitor their own performance and make decisions informed by the data. All this is geared towards ensuring a continuum of HIV care that addresses patients' needs in a respectful, efficient and effective manner with a goal to improve patient outcomes (Ministry of Health 2014).

While most HIV programs in Kenya have monitoring systems in place, a review of the viral suppression rate from the National AIDS and STI Control Programme (NASCOP) summary report reveals that more than 95% of HIV partners in Kenya are yet to achieve the UNAIDS targets of 90:90:90. The last of these target states that 90% of all HIV patients receiving antiretroviral therapy will have viral suppression (NASCOP 2017). Although program and other factors have a role in improving viral suppression of HIV-infected patients, the importance of an effective viral monitoring system in improving patients care can never be over-emphasized (Herzog, Scheuren and Winker 2007).

Monitoring systems face numerous challenges in most programs, some inherent to the framework of programs being executed and some reflective of the way in which health services are structured (Nash et al., 2009). In developing countries, there is persistently incomplete reporting and inaccurate data that pose a foremost challenge to its utilization for patient care (Nash et al., 2009). Some of the reasons stated include reporting tools designed and used by HIV mostly cascade the program progress upwards. Further, there has been inadequate, if any, downward

feedback mechanism to the individual programs (CLEAR 2012). In a study report of Australian NGOs, some staff indicated that they are obligated to collect and analyze data; however, they are unable to synthesize the data into meaningful information due to minimal research skills. In addition, some staff reported that there was no feedback loop built into the current system, so, while staff report on their activities to the management, they do not know what happens to the information once it is reported (Spooner and McDermott 2008).

While ministries of health collect performance information, the data quality is mostly poor. The reason is partly that the burden of data collection falls on over-worked officials at the facility level, who are tasked with providing data for other officials in district offices and the headquarters, but rarely receive any feedback on how the data are actually being used, if at all. Therefore, in such ministries, there is too much data, yet not enough information (Mackay 2006). Program information systems in developing countries often have problems with the quality of data collected, such as incomplete data and untimely reporting. However, these systems provide the only data sources that are available for the routine monitoring of program interventions (Kimaro and Twaakyondo 2005).

According to the Data Quality Assurance (DQA), report contained in Kenya National HIV/AIDS M&E framework (NACC 2009), most of the health facilities sampled had issues with data quality. The MOH registers had undocumented vital patient information, there was no proper mechanism for disseminating feedback to healthcare workers and the routine reporting to the MOH was untimely (NACC 2009) which raised questions on the utilization of the generated data for clinical management of HIV patients.

Viral load monitoring system, being part of the larger M&E system faces challenges related to unlinked data systems, poor data quality and limited use of data. Effective implementation of the viral load monitoring system necessitates for a vigorous monitoring system that harmonizes data flow across various levels of HIV program, communication of results by service providers to patients and decision by service providers based on the viral load results, data dissemination and use. Article by (Médecins Sans Frontières 2016) concluded that programs that have implemented electronic medical records for viral load monitoring and the possibility to link the system to the laboratory viral load databases provide accurate estimates of viral load coverage and suppression rate.

Therefore, whereas an effective viral load monitoring system is a vital component for provision of patient care in HIV programs (Agonnoude et al., 2016), most donors have focused majorly on viral load data collection and reporting to provide a regular response on the level to which programs are attaining their objectives. This leaves a gap in addressing quality of the viral load data generated from the viral load monitoring system, utilization of viral load data to drive decision-making in improving patients' clinical outcome as defined by the viral suppression and thus underscore the main aim of HIV/AIDS programs.

This study aims to carry out a comparative study of the viral load monitoring system at the Coptic Hope Center and that of the Lea Toto programs.

1.2 Problem Statement

Significant resources have been invested in the viral load monitoring system in developing countries. However, information generated from these monitoring systems is often not utilized by key stakeholders to effectively inform decisions within HIV programs. Instead, decisions are based on anecdotes and gut feelings. Failure to use this information during the decision-making process hampers the programs ability to act on the priority needs across its different levels (Gibb, et al., 2017).

Similarly, there exist gaps in enhancing the existing monitoring systems to effectively generate reliable data that can be used for viral load monitoring (Kawonga et al., 2012). The evidence demonstrated by Effler et al. (2000) on a comparison between electronic mode of data collection and the manual mode employed in most public health facilities, revealed that facilities with the electronic patients record were significantly inclined to using evidence for patient monitoring than facilities using viral load registers which hardly utilize the data collected for decision making.

Whereas data collection can always be improved, there exist gaps in the utilization of the information that should become a central element of program planning (CDC, 2009). A study by Garrib et al (2008) noted that limited data demand from service providers stemming from lack of data ownership, little value placed on the data by service providers stemming from little understanding on the importance of using data for decision-making or failure to present the information in the user-friendly format limits utilization of data for decision-making (Kimaro & Twaakyondo, 2005).

According to George (2010), in most health facilities offering HIV services in Kenya, nurses or clinicians who have the sole responsibility for monitoring systems in their facilities lack prerequisite M&E skills for collection, collation, analyzing and presenting results for utilization.

From the preceding literature, it is evident that the inefficiency of the viral load monitoring system affects viral load service delivery to HIV infected patients. This slows down the efforts of achieving the UNAIDS target of viral suppression. Whereas an efficient and effective viral load monitoring system plays a greater role on improved viral load suppression rate, studies reviewed revealed that little has been done on assessing the effect of the major components of a monitoring system and how they affect the effectiveness of the viral load monitoring system.

This study assessed factors associated with an effective viral load monitoring system in HIV programs using the case of the Coptic Hope Center and the Lea Toto HIV programs.

1.3 Research Question

This study was guided by the following research question: -

- What factors are responsible for an effective viral load monitoring system among the HIV-infected patients at the Coptic Hope Center program?

1.4 Objectives of the Study

The overall objective was to determine factors that are responsible for an effective viral monitoring system. Specifically, the study sought to:

- Assess components of the viral load monitoring system at the Coptic Hope Center and the Lea Toto programs

- Determine the factors contributing to the effectiveness of the viral load monitoring system for the Coptic Hope Center and Lea Toto programs

1.5 Justification of the study

The ultimate objective of viral load monitoring system is to generate information beneficial for decision-making. Viral load monitoring system is an essential component of an HIV program that helps to identify gaps in a program and to resolve them to maintain and improve performance.

Provided with an accurate, complete and timely viral information, program managers can identify the strengths and weaknesses of achieving UNAIDS targets of ninety percent viral load suppression rate. It was hoped that findings from this study would provide insight into the key factors that influence the viral load monitoring systems and thus contributing to the wellness of HIV patients. However, for factors outside their control, program managers can advocate for possible solutions and policy change.

Failure to use data for decision-making is due partly because of the complex pathways between data collection and its use for an informed decision. This study hoped to bridge the gap by identifying gaps in utilization of viral load data use and proposing specific recommendations on how to improve the use of routine viral load data in evidence-based decisions. This may lead to a significant improvement in patient's health outcomes moving toward epidemic control of HIV.

Finally, findings from this study will be important in bridging the gap in knowledge on viral monitoring system and stimulate further deliberations on monitoring systems of HIV programs

that will benefit researchers and scholars alike by providing useful findings as a reference to enrich monitoring and evaluation systems.

1.6 Scope of the study

This study focused on the Coptic Hope Center and the Lea Toto HIV programs. These two HIV programs were selected as a case sample due to their difference in viral load suppression rates. While the Coptic Hope Center has achieved more than 90% viral load suppression rate, the Lea Toto program is among programs far off from achieving the target. In these two programs, the study focused on three components of a monitoring system at the patient level. The study assessed the effectiveness of the data collection systems in the two programs, further, it assessed if there is established support supervision and data auditing processes and lastly, the study assessed the effectiveness of data dissemination and data use procedures.

1.7 Limitation of the study

HIV programs are viewed as very sensitive to carry out a study. To this effect, most of the respondents were not willing to give information for fear of being victimized in future. To curb this constraint, the researcher assured the respondents that the study was for academic purpose only and confidentiality would be maintained by not having any personal identifiers such as name, address and telephone numbers of the respondents.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter critically reviews the literature on what other researchers have done in relation to the factors influencing viral load monitoring systems. It starts on the basis of the viral load monitoring system. Thereafter, it reviews literature on the main three components of the viral load monitoring system and presents a conceptual framework.

2.2 Viral Load Monitoring System

Viral load monitoring system is a part of the larger monitoring and evaluation system. It forms an integral part of the success of an HIV project or program (Remme et al., 2010). It involves the continuous gathering of information about viral load indicators and meaningful aggregation of the collected information to a level appropriate to the relevant management (Mackay 2006). A monitoring system provides information that program managers and all stakeholders may utilize to identify strengths and weaknesses of a program, formulate action plans to be implemented and carry out necessary steps to realize the UNAIDS targets for viral load suppression (WHO 2014). The information generated from the viral load monitoring system is useful in improving the quality of services, enabling effective planning and resource allocation as well as demonstrating accountability to donors (WHO 2014). Therefore, if monitoring is missing in a program, it will be difficult to manage programs effectively (UNDP, 2007). Further, monitoring involves identifying appropriate indicators that give a timely warning to program managers of an actual and potential pitfall (Martin 2000). Based on such information generated through monitoring, program managers can make needed changes in the interventions to reinforce the implementation and realization of the program goals (World Bank 2004).

A viral load monitoring system involves three main essential components; collection of viral load data, conducting supportive supervision and data auditing, and data dissemination and use (Remme et al., 2010). These three components form part of the framework for a functional national HIV M&E System – 12 Components (UNAIDS 2010).

2.3 Data Collection system

According to Kawonga (2012), the anticipated aims of a viral load monitoring system have not been achieved in developing countries due to the following major reasons; there is weak or ill-defined systems for collection of the viral load data, incompetent data collectors, and inadequate technical capability to transform viral load data into functional indicators. EGPAF (2015) indicated that a weak data collection system impairs not only the ability of clinicians to offer quality care but also the ability of policymakers to introduce responsive national plans.

Before program strategies are implemented, the purpose and the scope of the data are well articulated. The purpose and scope of the data need to answer, "why do we need data and how inclusive does it need to be?". This guides decisions such as the data needs, data methodological approaches, capacity building and allocation of resources for data collection since data provides a solid basis for the monitoring system (Peersman et al., 2009).

When designing a data collection system, the needs of various stakeholders and their expectations are taken into consideration. It is important to establish the priorities and the data needs of all persons involved in the program. This helps in the ownership of the data and its use. A study on the effectiveness of an electronic medical records system to improve viral load uptake in Malawi argues that, even with the implementation of an electronic version of data collection tools, if the

expectations of the stakeholders are not netted in the initial phase of the development, service providers associate the databases with the implementers. They hence do not own the monitoring system, which in turn, affects the quality of the data collected (Miguel, et al. 2013).

Collection of data for viral load monitoring is pegged on the programs operational design (LogFrame). A well-defined logframe clearly articulates the information needs of the program. WHO (2014) recommends consideration for integration of the data collection procedures for sustainability of the viral load uptake during the initial phase of implementation of viral load testing.

A study by Kumar et al (2015) used the logical framework analysis to demonstrate its effectiveness in improving the performance of processes of healthcare service. The study included three major steps; the identification of the problem, designing solution and formation of the implementation plan matrix. The study found that the use of logical framework provides an effective technique for the provision of quality HIV services.

Lack of basic data collection skills not only affects the quality of data collected but also the competence to use data in decision-making. Comprehensive and specific training on completing data collection forms, especially on newly designed forms, is essential yet often overlooked. A study on an assessment of facility-specific data capturing forms compared these forms and the nationally defined forms on a number of HIV data elements. The study revealed that while VCT registers in all testing points and the ARV register at one site, were complete and all viral load forms had missing fields or were rarely used (Kawonga, Blaauw and Fonn, Aligning vertical interventions to health systems: a case study of the Viral load monitoring and evaluation system

in South Africa 2012). Facility managers attributed the incomplete documentation and non-use of data to their staff not being trained, especially on newly-introduced data elements and viral load registers. Failure to capture relevant data reduces the effectiveness of data usage to increase viral load uptake among the eligible clients (Kekana, et al. 2012).

Methods of data collection influence completeness of HIV reportable indicators (Effler, Ching-Lee and Bogard 2000). Whereas most HIV programs use viral load registers to collect data, programs with electronic medical records are more likely to provide complete patient and provider related data. When compared with traditional paper-based viral load reporting, reports generated from electronic laboratory data were found to have resulted in a 2.3-times increase in case reports. Garrib et al (2008) showed that most HIV programs in developing countries use paper-based monitoring system for collecting and storing patient-level data that is characterized by inaccuracy and incompleteness. The finding showed that paper-based monitoring system contributes to poor data quality and thus compromises delivery of healthcare services.

There is need to emphasize the importance of a strong data collection system for improving viral load uptake (Kekana, et al. 2012). During a baseline assessment for viral load testing, data on the capacity for the viral load testing and information on the support system for the viral loads are collected. Consideration is taken during the initial planning stage to ensure that the data collection system is able to track all the identified viral load indicators to enable program staff assess the degree to which the program has realized its intended outcome. Therefore, with the information needs, programs should inclusively plan for the collection and management of reliable data that can be efficiently analyzed and used for decision-making. This involves developing mechanisms for data collection, data collection tools and plans for data management.

2.4 Supportive supervision and data auditing

UNAIDS (2010) developed the 12 Components of M&E System Strengthening Tool to provide a framework for implementing effective HIV M&E systems. One of the 12 components is supportive supervision and data auditing. The article emphasized the importance of supportive supervision in an M&E system in that it is helpful in communicating expectations and normalizing processes and thus improving or supporting data quality (WHO 2008).

Supportive supervision involves helping people to improve their activities. It encourages an honest, two-way communication approach that enables solving a problem (WHO 2008). One of the main reasons for setting up data support supervision is to monitor the quality of data generated from the monitoring system since the quality of data in the program influences every decision made along the patient care continuum (Antony 2014).

Data auditing, on the other hand, involves a process of validating the accuracy and completeness of the data management process. In data auditing, one follows a specific set of steps to check the data in the monitoring system against the data sources, verify the quality and accuracy of data sourcing, data collation, data analysis, data reporting, and data use. It can be done as part of M&E supervision (UNAIDS 2010). These processes have been neglected for long due to negative perception associated with the authoritarian, inspection or control approach. However, with the recent ambitious targets of UNAIDS of achieving 90% viral load suppression by 2020, the monitoring and evaluation field has begun employing supportive supervision and data auditing in the routine monitoring of viral load data.

Gibb et al, (2017) reveal a great discrepancy in viral load data collected from three parallel medical record systems in Malawi; paper MasterCard, the National ART EMR, and LIMS, the viral load machine databases. The viral load data from all the three data sources agreed for only one patient in the cohort. The study asserts that most of the HIV programs are faced with data difficulties due to duplicative data management systems and susceptibility of these systems to error. It concluded by emphasizing on the need for routine data auditing to ensure that the viral load data collected is consistent across multiple data sources.

Supervision of the quality of viral load data ought to be performed continuously (Belshé and Shewry 2004). This is due to the importance of viral load indicators it measures in establishing the true virological status of HIV patients. The assessment further provides program staff with a level of confidence that can be attached to the viral load reports and how well the data can be used for decision-making. Ashley et al. (2012) underscored the importance of continuous supportive supervision to improve viral load data in HIV programs. In essence, it improves the capacity of staff to collect, manage, and use data. By improving a program's capacity to generate quality data, supportive supervision also contributes to the larger goal of strengthening patient's viral load monitoring system. However, in the study, there was very little reference in the discussions of supportive supervision for data use in decision-making or data demand, demonstrating that these components were not the focus during the supportive supervision visits.

Simon et al. (2017) in a study to assess the quality of viral load data in Malawi, reinforced the importance of supportive supervision in ensuring the quality of viral load data and its use in strategizing interventions for scaling up HIV patient outcomes. The study emphasized that supportive supervision for monitoring systems is a continuous process. It notes that continuous

supportive supervision is a critical component tool for ensuring the utilization of patient information for improving the adherence rate of patients on Anti-Retroviral Therapy (ART). The study concluded by denoting that whereas good adherence to ART has been associated with an improved viral load of patients, continuous supportive supervision of monitoring system can be associated with improved viral load suppression rate of HIV patients.

To enhance continuous supportive supervision, HIV programs establish standards and procedures for data quality assurance in accordance with national standards. They should also agree on data quality standards with other sectors of the organizations including coming up with consensus on standardized protocols and tools for data audits and supervision (UNAIDS 2010).

Good supportive supervision comprises of quality checks of reporting and recording: data collection tools are inspected, the transfer of data is re-evaluated and elements of the quarterly reports are re-calculated. It includes identification and discussion of challenges or misinterpretations in data and provides opportunities for learning. These data collected from the continuous supervision efforts are a source of significant feedback on progress and challenges in implementation (Ashley and Jessica 2012).

2.5 Data dissemination and use

One of the main purposes of a monitoring system is to provide useful information that can be utilized for informed decisions to improve program interventions and to strengthen programs institutionally. It is, therefore, critical that utilization of information is a central element of program planning. Effective and efficient dissemination of data entails careful consideration to

several components, including, the audiences or the needs, the frequency, the format of the message and the people responsible (CDC 2009).

Most HIV donor-funded organizations spend much efforts in collecting huge amounts of unnecessary data that, once the data is gathered, those responsible basically collate the data they gathered into standardized data reporting tool and submit the resultant performance reports to higher levels with very little attempt to analyzing and utilizing the data for an informed decision at the facility level. Kawonga et al. (2012) carried out a study in South Africa that revealed a massive collection of data at the facilities, duplication of data collected, inadequate data recording, and not using nationally-defined forms. These characteristics were shown to underscore the fact that despite a large amount of data gathered, the facilities had insufficient information to guide actions and thus could not allow monitoring of key performance measures of viral load indicators like uptake rate of viral load and the viral load suppression rate limiting the dissemination and potential use of the viral load data for decision-making. The study recommended for a restructure of the viral load monitoring system to ensure that only relevant viral load data are collected that address the needs at different levels of the program.

Monitoring systems are developed to address the needs of different users of data at all levels of health programs. Due to the various needs of different data users that access monitoring systems, the data generated may not essentially meet the specific data needs of all data users. Moreover, the additional data required by the different data users have been shown to result in duplication of data collection. This leads to an increased work burden, thus affecting the quality of data generated and also the utilization of the data (Garrib, et al. 2008). To facilitate data use, there is need to focus only on what data users need to know to efficiently track HIV programs. Designers

of viral load monitoring systems focus on collecting data that is directly related to decision-making by focusing on the 'need to know' rather than the 'nice to know'.

Garrib et al. (2008) established that 2.5% of the data in the viral load register at 10 HIV programs in South Africa using a paper-based system were empty, whereas 25% of the data were outliers. These deductions necessitated a Health Information System that is web-based so as to reduce errors in viral load reports and improve accuracy and utilization of the viral load data. Such a Health Information System has enabled the ability to capture accurate and complete data required to inform decision-making (Micheal, et al., 2014).

The utility of the viral load data necessitates that there is either internal or external demand for the viral load data (MEASURE Evaluation, 2012). A study conducted in South Africa indicated that the majority of the respondents were less involved in the utilization of the viral load monitoring data in the decision-making process, strengthening or improvement of the program and advocacy of more resources to achieve targets (Kawonga, et al., 2012). To increase internal demand, there is need to introduce incentives to promote utilization of the performance data meaning acknowledgment and rewarding, addressing problems and valuing organizational learning. External demand for certain data on viral load indicators plays a vital role in encouraging measurement of those outcomes. Nevertheless, where either the internal or the external demand is missing or where the performance data is not linked to the viral load monitoring system, the incentives for utilizing the generated performance data are deficient and the viral load monitoring system is weak (Estill, et al., 2012).

To ensure a sustainable demand and utilization of data in decision-making, health care workers' ability in the proficiency to demand and utilize the data generated must exist at all levels of the HIV program. The competencies can be enhanced by conducting training on the best way to collect data, data analysis, interpretation and presentation of the data to inform decisions. These include skills in data collection, analysis, interpretation, synthesis, presentation, and the development of data-informed programmatic recommendations.

Empirical studies on the viral load carried out among selected facilities in Malawi pointed to the fact that the viral load monitoring system is sub-optimal in improving the uptake of viral load and achieving a more than ninety percent viral load suppression rate among HIV-infected patients (Gibb, et al. 2017). According to a study conducted in government-owned health facilities in Malawi, showed vast variations exists in both the accuracy of data reported between the selected viral load data element and utilization of the collected data for decision-making. Analysis of six data elements from 207 health facilities that submit their reports through the DHIS platform showed that only 50.3 percent of the data reported were complete (Gibb, et al. 2017).

A similar study conducted in Kenya to assess the ability of the existing monitoring systems in 34 health facilities to support informed decision-making found out that 60 percent of the monitoring systems do not deliver quality data in addition to significant constraints that exist in technical expertise, supervisory support and financial constraints (Karani, Bichanga and Kamau 2014).

An action research study carried out on improving data quality and its utilization through data-use workshops in Zanzibar, reveals that staff responsible possess weak presentation skills as they

were unable to draw graphs, had difficulties in using PowerPoint, engaging in deliberation or contributing useful criticism (Heywood and Sahay 2012).

2.6 HIV programs in Kenya

In Kenya, the U.S. President's Emergency Plan for AIDS Relief (PEPFAR), a United States government initiative to help improve the lives of HIV infected patients, has focused on initiatives to improve and strengthen monitoring systems and utilization of HIV data among HIV programs to inform decisions. To achieve this, PEPFAR has collaborated with local, international and faith-based organizations to drive the UNAIDS target of ninety percent viral load suppression. Among partners supported by PEPFAR to strengthen viral load monitoring system in Kenya are the Coptic Hope Center and the Lea Toto programs that offer comprehensive HIV/AIDS care services in their facilities.

The Coptic Hope Center is a faith-based organization whose aim is to address the impact of HIV/AIDS on the lives of the Kenyan communities it serves. PEPFAR supports the program through the Center for Disease Control (CDC). It has been hailed as one of the largest single HIV/AIDS treatment facility in Nairobi and is among the most successful of the PEPFAR-supported programs in Africa. Activities at the Coptic Hope Center program include HIV counseling and testing; delivery of free ART among other HIV services. According to NASCOP website, the Coptic Hope Center program has managed to achieve a viral suppression rate of more than 90 percent of its HIV-infected patients (NASCOP 2017).

The Center has an established viral load monitoring system. The monitoring and evaluation unit started in 2005 in collaboration with the University of Washington-Treatment, Research, and

Expert Education (TREE) program. The TREE program established the M&E unit and continuously provided it with technical M&E support supervisory and data auditing. They also ensured that a separate costed M&E plan is developed annually to ensure the smooth running of the M&E system. The TREE program periodically conducts data auditing to ensure the data generated from the M&E system is complete, accurate and reliable for program monitoring and reporting (Coptic Hope Center for Infectious Diseases 2016).

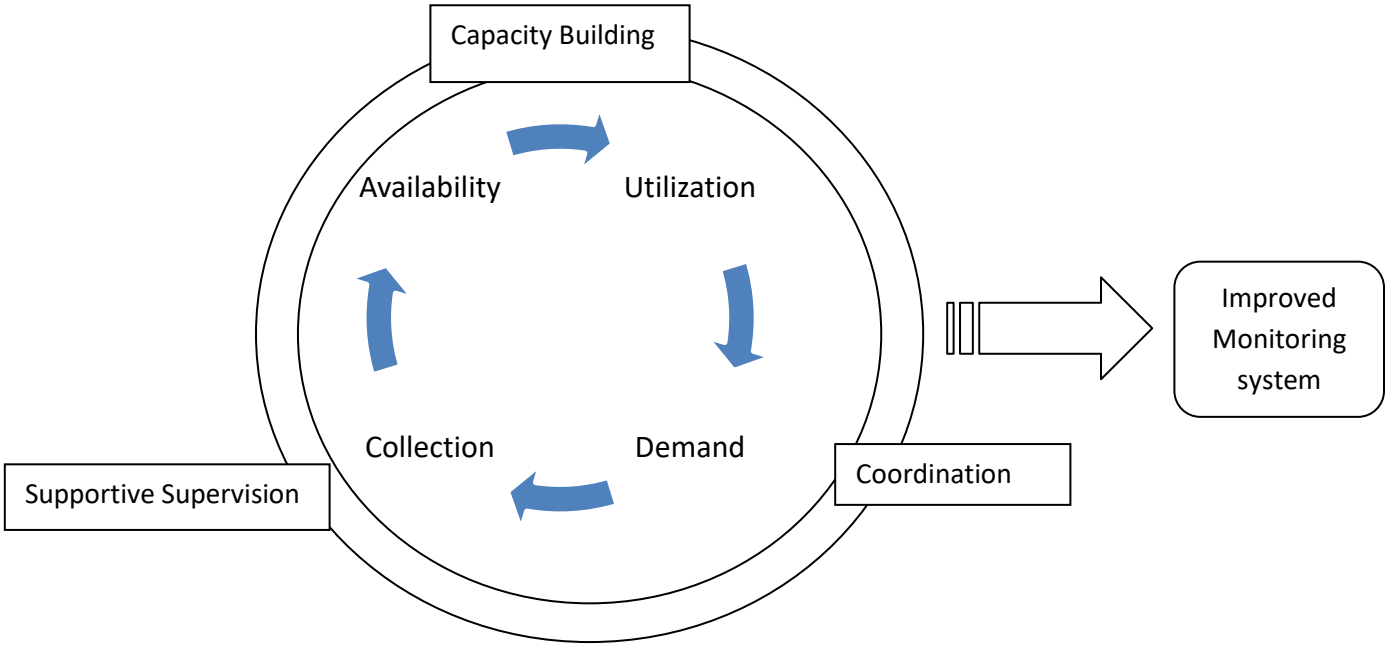
The data is used to inform decisions and to carry out evaluation activities. Currently, the unit boasts of a staff capacity of eight well-trained M&E experts and numerous data staff with a well elaborate viral load monitoring system. This system is embedded in its annual M&E plan. The unit oversees the routine viral load monitoring working in partnership with other stakeholders to ensure that gaps are identified in a timely manner and corrective measures informed by the monitoring system are adequately implemented. The unit has managed to effect data ownership by the service providers through holding routine data dissemination forums. The M&E unit has contributed to the improvement of viral load suppression rate at the Coptic Hope Center program (Coptic Hope Center for Infectious Diseases 2016).

On the other hand, the Leo Toto HIV Program provides a home-based HIV care. The program is run by Nyumbani and provides care for children with HIV/AIDS. It operates in eight centers in Nairobi. It serves over 3,000 HIV-infected children since its inception in the year 2007 with an aim of mitigating the effects of HIV/AIDS through the provision of a comprehensive home-based HIV care package to children below the age of 18 years. According to the NASCOP website, the Lea Toto program has managed to achieve a viral suppression rate of 69% percent of its HIV-

infected patients. The Lea Toto program is yet to implement most of the M&E components in its monitoring system to track the progress of patients viral load (NASCOP 2017).

2.6 Conceptual Framework

The conceptual model below shows the framework for the evidence-based decision-making in health programs. The cycle below connects demand for data, data collection processes, availability of information and utilization of data as outlined by MEASURE (2012). Supportive supervision, capacity building, and coordination support the cycle. In the framework, there is a link between the use of program information and the commitment to improving the quality and availability of data. In this cyclical process, improved data use encourages the demand for information, which leads to more information use, leading to more demand, and so on.



Source: MEASURE Evaluation (2012).

2.7 Operational Framework

The study operationalized the three components of the viral load monitoring system. The operational framework for the study was adapted from the MEASURE Evaluation (2012) framework for a functional HIV monitoring and evaluation system.

Table 2.7.1 Operationalization summary

S/No	Elements relating to the viral load monitoring system	
	Component	**Operational indicators/Standards**
1	Data collection system	• The system has a documented plan to ensure accurate and reliable viral load data is generated • There are standard operating procedure to resolve errors in the data collection system • The system has functions that assist health workers in making prompt clinical decisions to enhance patient care • The system should be easy for use
2	Supervision and data auditing	• There are procedures and plans for supervision of M&E activities. • Results of supervision are documented and shared with supervisees • There is a documented plan for improvement based on the result from the data supervision • There is a documented plan for the supervision feedback to other stakeholders
3	Data dissemination and use	• Information is always used for decision making • Information is transmitted to a variety of stakeholders using various methods • Change is a result of the use of information generated • There is a documented plan to ensure the following data issues relating to data use and dissemination are addressed 1. Accuracy 2. Completeness 3. Timeliness 4. Access

2.8 Summary of the literature review

The literature reviewed underlined studies that are appropriate and comparable to this study. Effler et al. (2000) compare the completeness and frequency of reporting of the conventional data collection tools to their corresponding electronic versions. The findings indicated that whereas most developing countries use the paper-based method of collecting data, they are continuously faced with an up-task of ensuring the data collected from the systems is of high quality. Effler et al. (2000) further compared the completeness and frequency of reporting of five data elements using the two data collection methods in different facilities. This study proposes to factor in the accuracy and efficiency of the two data collection methods.

Garrib et al. (2008) conducted interviews with facility staff including managers, M&E staff, and service providers to evaluate the impact of an electronic data collection system in promoting the utilization of the viral load data for facility management. Data was collected over a period of 12 months for every clinic and the data was assessed for missing entries, outliers, and violation of the validation rule. This study will compare the impact of the electronic and the conventional methods on the quality of data and utilization of the data for decision-making.

Likewise, Miguel et al. (2013) undertook a study to demonstrate that an electronic data collection system can be used to effectively provide ready access to patient information and thus improve service delivery. Whereas accessibility to information can improve utilization of the information, Effler et al. (2000) and Garrib et al. (2008) have demonstrated that other factors confound the utilization of patient data for program improvement.

CHAPTER THREE: DATA AND METHODS

3.1 Introduction

This section describes the data and methods that were used. They include the research design, target population, sampling procedure and sample size, data collection instruments, their reliability and validity, the procedure for data collection and data analysis.

3.2 Research design

The study used a cross-sectional study design. It is a type of study design carried out at a point in time or a shorter duration and analyzes data at a specific point in time. Specifically, the study assessed and made a comparison of the availability and effectiveness of the following components of a monitoring system; routine monitoring, data supervision and auditing and data dissemination and use.

3.3 Target Population

Data for the study was collected from staff within the various components of the viral load monitoring system and a review of the existence of all components of a viral load monitoring system. This included monitoring and evaluation staff, program managers and clinical staff. The staff were targeted because they are among the primary stakeholders in the viral load monitoring system.

3.4 Sample size and sampling procedure

The study used a simple random sampling on the target population to select the sample. In such case, the sampling frame was composed of staff based on their involvement with the viral load monitoring system. This included staff in the monitoring and evaluation department, program

managers, and clinical staff were sampled. Simple random sampling was applied to the three selected departments. Using Yamane's simplified formula for proportional, seventy-two (72) respondents distributed proportionally among staff in M&E/data, clinical and program departments in the two organization were selected. In each organization, 36 respondents were interviewed.

3.5 Source of data

Source of data refers to the specific population and records from which information was collected. The target population was staff at the Coptic Hope Center and the Lea Toto programs. Questionnaires were designed to collect the primary data with a focus to address the components of the viral load monitoring system in place. They consisted of items that applied the Likert scale with the answers ranging from strongly agree, agree, not sure, disagree and strongly disagree on a 1/2/3/4/5 ranking scale. Further, a documents/records review process was employed to review the minutes, project reports, M&E plans, electronic medical record system, among others. Discussions were held with key informants such as M&E managers/in-charge, program managers/ coordinators. Observation was also used to observe practical aspects of M&E such as the use of the electronic medical record system and patient records. The information was also used to make inferences during results presentations.

3.6 Data Collection

It is believed that using different types of procedures for collecting data and obtaining information through different sources can enhance the validity and reliability of the research data and their interpretation. Questionnaires, discussions and review of the documents were used to collect qualitative and quantitative data. Primary data was collected using questionnaires by

interviewing the target population, which comprised of staff in M&E, data, clinical and program departments. Data on the three main components of the viral load monitoring system, namely, data collection method, support supervision and data dissemination and use, which formed the basis of the data collection tool. Specifically, the questionnaire focused on the existence of data system, manual or electronic and their challenges with respect to the viral load data quality, supportive system from the program management and the extent of utilization of viral load data and the challenge experienced. The respondents were program management team, the monitoring and evaluation team and the service providers of the two organizations. Drop and collect questionnaire administration method were used to get information from the selected interviewers. Follow-ups were done through phone calls, email and personal visits.

3.7 Data Analysis

Both qualitative and quantitative data analysis methods were employed to analyze the data. Qualitative data analysis sought to respond to the objectives of the study. This was done by generalizing about the phenomena in question and interpret in the light of the available literature. Specifically, knowledge, involvement, skills, perception, practices, and learning were analyzed in relation to the three components of the viral load monitoring system.

Comparison was made between responses based on the Likert scale of respondents from the two program using percentages. The analyzed quantitative data helped in explaining the findings on the strengths, challenges and weakness to the three components of the viral load monitoring system.

CHAPTER FOUR: FACTORS INFLUENCING EFFECTIVENESS OF VIRAL LOAD MONITORING SYSTEM

4.1 Introduction

This chapter presents the study results on factors that are influencing the effectiveness viral monitoring system. The results use a comparative approach of the viral load monitoring systems at the Coptic Hope Center and the Lea Toto programs bringing out factors influencing effectiveness of viral monitoring system.

4.2 Respondents profile

This study targeted 72 respondents grouped into 36 respondents from each program. The respondents were derived from the relevant units namely; monitoring and evaluation, program and the clinical unit that comprised of clinicians and nurses as presented in table 4.1.

Table 4.1*:* ***Distribution of respondents across different departments***

Department	Coptic Hope Center	%	Lea Toto	%
Monitoring and Evaluation	11	30%	11	31%
Program	10	28%	4	11%
Clinical	15	42%	21	58%
Total	36		36	

Source: Researcher, 2018

Respondents were from different age groups. Table 4.2 showed that most (50 percent) of the respondents were aged between 31 to 40 years in both programs. Among the respondents, the Coptic Hope Center program had a relatively younger population (36 percent) of age 21 to 30 years in comparison to the Lea Toto program (28 percent) being an indication that programs consider staff of young age.

Table 4.2: ***Distribution of respondents across different age group***

Age Group	Coptic Hope Center	%	Lea Toto	%
21-30 Years	13	36	10	28
31-40 Years	18	50	18	50
41-50 Years	5	14	7	19
51-60 Years	0	-	1	3
Total	36		36	

Source: Researcher, 2018

Table 4.3 revealed that 47 percent of the respondents at the Coptic Hope Center program had diploma as the highest education level compared to 56 percent of the respondents at the Lea Toto program. Likewise, 33 percent of the respondents at the Coptic Hope Center program had a bachelor's degree compared to 36 percent of the respondents at the Lea Toto program. Eleven (11 percent) of the respondents at the Coptic Hope Center program were of certificate level whereas the Lea Toto program had none.

Table 4.3: ***Distribution of respondents across the level of education***

Age Group	Coptic Hope Center	%	Lea Toto	%
Certificate	4	12	0	
Diploma	17	47	20	56
Bachelors	12	33	13	36
Masters	3	8	3	8

Source: Researcher, 2018

Table 4.4 shows the median working duration among the respondents at the Coptic Hope Center program was 4 years with inter-quartile range (3, 6) while at the Lea Toto program, it was 6 years

with inter-quartile range (3, 9) years suggesting that respondents at the Lea Toto program had worked longer than respondents at the Coptic Hope Center program as presented in table 4.4.

Table 4.4*:* ***Distribution on number of years at present job station***

Program	Median	IQ range
Coptic Hope Center	4	(3,6)
Lea Toto	6	(3,9)

Source: Researcher, 2018

4.3 Results on the data collection systems

This section presents results for the data collection system for viral load as a component of the viral load monitoring system and the respondents view on the simplicity of the viral load monitoring system. For this component, observations of the viral load monitoring systems were made in both programs. In addition, since the Coptic Hope Center program uses an electronic medical records system for viral load, the respondents were asked to rate the system in terms of its simplicity to use.

A review of the viral load monitoring systems showed that the Coptic Hope Center program has a relatively well elaborate viral load monitoring system that supports viral load monitoring. The program has adopted an electronic medical records system that provides the clinical service provider with a desktop access to patient viral load records at the point of care. The system prompts the user when the patient is due for a viral load test. Then the clinicians order for a viral load test. Thereafter, the patient is sent to the laboratory for the viral load sample to be drawn. Once the results are available, the data clerk enters the results into the system. During the subsequent patient visits, a copy of the viral load result is availed to the patient. Using the system,

the service provider is able to track the progress of the patient viral load results over time at a glance and make a clinical decision based on the progress.

"This system has helped us a lot to track the progress of the patient viral load and make a prompt clinical decision on improving the viral load outcome of the patient. Where I previously worked before coming to Coptic, it was hectic to peruse through those registers to track patient progress" (Clinician at the Coptic Hope Center).

Table 4.5: ***Distribution on ease of understanding viral load monitoring system functionalities at Coptic Hope Center***

Departments	Very Difficult (n)	%	Difficult (n)	%	Average (n)	%	Easy (n)	%	Very Easy (n)	%
M&E	0		0	0	3	27	8	73	0	
Program	0		3	30	4	40	3	30	0	
Clinical	0		3	20	4	27	8	53	0	
Total	0		6	17	11	31	19	52	0	

Source: Researcher, 2018

Results in table 4.5 showed that most (52 percent) of the viral load system users at the Coptic Hope Center program reported that the viral load monitoring system was relatively easy to interact with. However, the results differ across different service units. Seventy-three (73) percent of M&E respondents felt that the system was easy to use whereas only 30 percent of program respondents and 53 percent of clinical respondents felt the viral load system is easy to use. Further analysis showed that few (17 percent) of the respondents felt that the system is difficult to understand its functionalities whereas 31 percent of the respondents felt the system was of average in terms of ease of using it.

A review of the Lea Toto program viral monitoring system revealed that the system relies on the government's ministry of health registers as the main source of information management for daily service delivery. In addition to the registers, each patient has a medical file for filing forms that are used to document clinical and non-clinical summary by the service providers. The viral load monitoring system does not allow the service provider to navigate efficiently through the countless medical records to track the viral load progress of each patient. Over time, the questionnaires pile in the medical file rendering the process of tracking viral load progress difficult since they cannot be searched quickly when the care provider at the point of care must make a decision.

"*It's easy completing the questionnaires since we are accustomed to the skip routine pattern embedded in the questionnaire, however, it's very difficult to retrieve the information needed to make a prompt decision, especially on patients failing treatment. We always rely on the data staff to give us the report which takes time to get"* (Clinician at the Lea Toto program).

Once the service provider decides to request viral load test, the patient goes to the laboratory for the viral load test. The service provider then completes the viral load register in addition to the requisite viral load data collection form, which results in duplication of work.

The above findings concur with the findings that the method used for viral load data collection has an impact on the effectiveness of the viral load monitoring system. Whereas paper-based method is easily understandable and easy to use, electronic medical records provide an easy access to the data through a desktop holistic view of patient records that ease tracking patient progress for a continuum of care, a component that is lacking in the paper-based system. Further,

its' advantage in streamlining the workflow supersedes challenges of patient flow as a result of the use of the manual system. While electronic medical record reveals numerous advantages over the paper-based system, response of the respondents from the Coptic Hope Center program agreed with the findings that comprehensive and specific training on completing data collection forms should be emphasized to realize the full benefit of the electronic system.

4.4 Supportive Supervision

This section presents results on the supportive supervision practices in the two programs and the respondent view on the benefits of supportive supervision on the viral load data as a component of the viral load monitoring system. The study sought to determine supportive supervision practices associated with effective viral load monitoring system.

Findings showed that the Center for Disease Control (CDC-Kenya) has been tasked by the donors to carry out supportive supervision on all the program data annually to both the two programs. A team of CDC-Kenya experts, derived from different program areas, conducts supportive supervision through a standardized checklist christened SIMS facility master tool that guides them through the entire process. Scoring is done based on achievements on specific indicators listed in the checklist. The supportive supervision focuses on among other areas, whether each program conducts and documents routine data quality assurance procedures using a standardized protocol. It also focuses on validating and checking data by comparing primary data collection forms to registers and reports. Completeness and accuracy of the forms and registers are checked by redoing calculations and verifying that the numbers and totals matched in all forms.

"*The amount of collaboration between supervisees varies by session, some of them hardly goes beyond data checking. There is limited discussion of problem solving, confidence, or motivation between these supervisors and our staff" (*M&E officer at the Lea Toto).

Further, supportive supervision establishes if each program has a system for review and use of performance data to inform implementation of data quality improvement (QI) activities. Suggestions are also made on the possible ways to improve on indicators each program has scored below par.

"*Supportive supervision helps us to improve on our activities and the data quality. When they come, they bring an extra eye and see things we might have missed out. This helps to streamline things out and improve the quality of our data."* (Discussion with M&E officer: Coptic Hope Center).

A review of the most recent SIMS facility master tool reports revealed that the Coptic Hope Center program scored 89 percent of all the facility indicators reviewed whereas the Lea Toto program scored 73 percent overall. The respondents were further interviewed on their perception of the benefit of the supportive supervision on the improvement of viral load data.

Table 4.6 shows results from the study on the respondents view on the benefits of the supportive supervision in relation to the viral load data in the two programs

Table 4.6: ***Distribution of respondents by their views on benefits of supportive supervision***

	Program			
	Coptic Hope Center n=36	**Column %**	**Lea Toto** n=36	**Column %**
Improve the credibility of the data	32	89	31	86
Build program implementers' capacity in routine data collection and capture, and in using data to improve their own programs	9	25	8	22
Improve the use of information for decision making	21	58	17	47

Source: Researcher, 2018

Findings from Table 4.6 showed that there was no noteworthy difference in rating on the various benefits of the supportive supervision between the two programs. However, most of the respondents (89 percent in the Coptic Hope Center program and 86 percent in the Lea Toto program) felt that supportive supervision improves the credibility of the program data. Only 25 percent of the respondents at the Coptic Hope Center program and 22 percent at the Lea Toto program felt that the supportive supervision builds the program implementers' capacity in routine data collection and capture and in using data to improve their own programs. Fifty-eight (58 percent) of the respondents at the Coptic Hope Center program and 47 percent of the respondents at the Lea Toto program felt that supportive supervision improves the use of information for decision-making.

Findings from Table 4.6 further revealed that supportive supervision of the viral load data is beneficial in improving the quality of viral load data. It improves the credibility of the viral load data. This finding concurs with the literature that supportive supervision helps people to improve their activities. It provides in-depth site-level assessments of programs data using implementation standards to identify areas that need further improvement. It also encourages an honest, two-way

communication approach that enables solving a problem. Feedback from the supervision comes immediately during the supervision visit. Further, a comprehensive feedback comes a few days after the supervision. Immediate feedback is often centered on the quality of data in primary collection tools and registers. Continuous supportive supervision ensures better data collection and reporting, increased ability to identify and remedy problems, improvements in staff motivation and training, and standardization of tools.

4.5 Data dissemination and use

This section presents results on data dissemination and use practices in the two programs and the related bottlenecks for using viral data for decision making as a component of the viral load monitoring system. The study sought to determine practices of data dissemination and use associated with an effective viral load monitoring system.

A review of the data dissemination and use practices in the two programs showed that both of them have embraced various methods of disseminating viral load data to the lower level staff. A further review of documentation at the Coptic Hope Center program revealed that the program has a written standard procedure for viral load data dissemination. Viral load runs charts that show progress in achieving the programs' allocated targets are displayed on the wall. Additionally, a monthly report on the progress of various viral load indicators is shared on email and discussed on the last Friday of every month. Quality improvement meetings (QIMs) are conducted periodically to address the challenges of viral load. In addition, there exist routine monthly viral load summaries submitted to different stakeholders on email and copied only to the relevant departmental head. These reports include finer disaggregation that unpacks the viral load data and can help in identifying gaps and the best interventions to address the viral load gaps.

On the other hand, the Lea Toto program has viral load progress charts displayed on the notice board. The charts show achievements in viral load towards achieving the viral load suppression target of 95 percent. Further, the program has adopted a Kenya HIV Quality Improvement Framework (KHQIF) model to implement viral load quality improvement activities. This model involves forming a working improvement team (WIT) comprised of different members who work on the project at hand. Deliberations of such meetings are shared among the WIT members. Interventions suggested during such meetings are communicated to the relevant department by the head of that department.

This study sought to find out how frequently the respondents use viral load data to make informed decisions related to viral load.

Table 4.7: ***Distribution of respondents view of frequency of using viral load data to make all the viral load related decisions***

	Program			
	Coptic Hope Center n=25	**%**	**Lea Toto n=25**	**%**
Always	9	36	4	16
Most Times	14	56	6	24
Some Times	2	8	15	60
Rarely	0	0	0	0

Source: Researcher, 2018

Table 4.7 shows that most (56 percent) of the respondents at the Coptic Hope Center program reported that they use data for decision making most times where only 24 percent of the respondents at the Lea Toto program reported to use data to make decision always most times. Only 36 percent of respondent at the Coptic Hope Center program and 16 percent of the

respondents at the Lea Toto program reported to always rely on the viral load data for decision-making. However, 8 percent of the respondents at the Coptic Hope Center program and 60 percent of the respondents at the Lea Toto program reported that they periodically use the viral load data for decision-making.

Data dissemination involves communicating the information through defined channels to a specific group of audience with an intention of spreading knowledge and the associated evidence-based interventions. There is no one right way to disseminate information, and there is no one right message strategy. However, guidelines that outlay the best procedures or steps for disseminating healthcare data have been developed. These steps can be summarized as follows; decide on what you intend to disseminate, identify end users, work with other disseminating partners, communicate your message, evaluate disseminating success and finally develop a disseminating work plan. It is, therefore imperative to ensure the effectiveness of communication strategies to promote the use of health and health care evidence by patients and clinicians.

Respondents were also interviewed on the various methods used to inform them of the progress of the viral load uptake.

Table 4.8: ***Distribution of respondents by their views on viral load data dissemination***

	Program			
	Coptic Hope Center n=25	**%**	**Lea Toto n=25**	**%**
Dissemination forums	13	52	5	20
Discussion meetings	17	68	12	48
Viral load charts on the wall	25	100	23	92

Source: Researcher, 2018

Table 4.8 shows that 52 percent of the respondents at the Coptic Hope Center program are informed on the progress of viral load through participating in dissemination forums. These forums include monthly and quarterly meetings to deliberate on the progress of viral load. Only heads of department, program managers and a few departmental representatives are involved in the dissemination forums. Likewise, 20 percent of the respondents at the Lea Toto program reported participating in the dissemination forums. Only managers attend the dissemination forums. Further, 68 percent of the respondents at the Coptic Hope Center program and, 48 percent of the respondents in the Lea Toto program participate in discussion forums, which include CQI. Viral load charts are displayed at the Lea Toto programs' notice boards while viral load run charts are displayed at the Coptic Hope Center programs' walls. Most of the respondents reported being conversant with either the run charts or the wall chart.

Table 4.9: ***Respondents views on whether the observed change occurred through use of data collected***

	Coptic Hope Center n=25	Lea Toto n=25
Yes	23 (92%)	22 (88%)
No	2 (8%)	3 (12%)

Source: Researcher, 2018

Table 4.9 showed that ninety-two (92 percent) of the respondents at the Coptic Hope Center program and 88 percent of the respondents at the Lea Toto program reported that they have realized program change as a result of the use of data collected through the viral load monitoring system. Further, 8 percent of the respondents at the Coptic Hope Center program and 12 percent

of the respondents at the Lea Toto program reported having experienced no program change as a result of the use of data collected through the viral load monitoring system.

The study also established reasons the respondents felt might hinder the use of viral load in making informed decisions to improve patients' outcome. Using a Likert scale of 1-5 where greatly disagree-1, disagree-2, undecided-3, Agree-4, greatly agree-5 respondents were asked to indicate the extent to which they agree or disagree with a number of reasons.

Table 4.10: ***Distribution of respondents view on reasons that hinder the use of viral load information in their programs***

		Greatly disagree (n)	**%**	**Disagree (n)**	**%**	**Undecided (n)**	**%**	**Agree (n)**	**%**	**Greatly agree (n)**	**%**
No benefit of using data	Coptic Hope Center	11	44	9	36	2	8	3	12	0	0
	Lea Toto	6	24	11	44	3	12	5	20	0	0
Overwhelmed by workload	Coptic Hope Center	0	0	3	12	0	0	15	60	7	28
	Lea Toto	0	0	3	12	0	0	14	56	8	32
Not involved in decision-making	Coptic Hope Center	4	16	15	60	0	0	5	20	1	4
	Lea Toto	1	4	10	40	0	0	9	36	5	20
Lack of pre-requisite knowledge of data use	Coptic Hope Center	5	20	14	56	1	4	5	20	0	0
	Lea Toto	6	24	14	56	0	0	5	20	0	0

Source: Researcher, 2018

Table 4.10 shows that majority (80 percent) of the respondents at the Coptic Hope Center program disagreed that there was no benefit of using data for decision-making compared to the Lea Toto program (68 percent). Conversely, 20 percent of the respondents at the Lea Toto program felt that they see no benefit of using data for decision-making. A greater proportion (88 percent of the respondents at the Coptic Hope Center program and 88 percent of the respondents

at the Lea Toto program) of the respondents felt that their workload has hindered them in using data for decision-making. Further, a majority (76 percent) of the respondents at the Coptic Hope Center program disagreed that they are not involved in the decision-making process compared to the Lea Toto program (44 percent) indicating that most of the service providers at the Coptic Hope Center program are involved in the process of decision-making. Majority (80%) of the respondents at the Lea Toto program felt that they possess pre-requisite knowledge of data use needed for decision-making activities compared to the Coptic Hope Center program (76 percent).

The study also sought to establish respondents' views on decision-making. Using a Likert scale of 1-5 where greatly disagree-1, disagree-2, undecided-3, Agree-4, greatly agree-5 respondents were asked to indicate the extent to which they agree or disagree with the following statements.

Table 4.11: ***Distribution of respondents' views on basis of viral load data decision-making in their program***

		Greatly disagree (n)	**%**	**Disagree (n)**	**%**	**Undecided (n)**	**%**	**Agree (n)**	**%**	**Greatly agree (n)**	**%**
Some decisions are based on experience/gut feeling	Coptic Hope Center	6	24	13	52	1	4	5	20	0	0
	Lea Toto	4	16	11	44	1	4	9	36	0	0
Some decisions are based on superiors directives	Coptic Hope Center	7	28	9	36	3	12	6	24	0	0
	Lea Toto	1	4	6	24	6	24	12	48	0	0
Some decisions are based on facts	Coptic Hope Center	0	0	3	12	0	0	14	56	8	32
	Lea Toto	1	4	7	28	1	4	13	52	3	12
Some decisions are based on political directives	Coptic Hope Center	12	48	12	48	1	4	0	0	0	0
	Lea Toto	9	36	12	48	3	12	1	4	0	0
Some decisions are based on personal liking	Coptic Hope Center	7	28	14	56	0	0	4	16	0	0
	Lea Toto	2	8	11	44	7	28	5	20	0	0
Some decisions are based on donor	Coptic Hope Center	0	0	6	24	0	0	15	60	4	16

demands	Lea Toto	0	0	6	24	0	0	12	48	7	28

Source: Researcher, 2018

Table 4.11 shows that thirty-six (36) percent of the respondents at the Lea Toto program felt that somewhat, some decisions that relate to viral load are made based on experience or gut feelings and not by use of viral load data. This proportion was higher than the response of the respondents (20 percent) at the Coptic Hope Center program who felt that decisions that relate to viral load are made based on experience or gut feeling. Further, 48 percent of the respondents at the Lea Toto program reported that some decisions are made based on the superiors' directive and not based on the viral load data whereas majority (64 percent) of the respondents from the Coptic Hope Center program disagreed that decisions are made based on the superiors' directive.

Eighty-eight (88) percent of the respondents at the Coptic Hope Center program and 64 percent of the respondents at the Lea Toto program agreed that most decisions are made based on the viral load data. Respondents from both programs disagreed (96 percent for the Coptic Hope Center program and 84 percent for the Lea Toto program) that some decisions are made based on personal liking or political directives. However, respondents from both programs agreed (76 percent for the Coptic Hope Center program and 76 percent for the Lea Toto program) that some decisions are based on donor demands.

4.7 Viral load data quality

This section presents results for various characteristics of viral load data in the two programs and the related bottlenecks for using viral data for decision making as a component of the viral load

monitoring system. The study sought to determine various characteristics of viral load data quality associated with an effective viral load monitoring system.

4.7.1 Viral load data accuracy

Using a Likert scale of 1-5 where greatly disagree-1, disagree-2, undecided-3, Agree-4, greatly agree-5 respondents were asked to indicate the extent to which they agree or disagree with the following characteristic of viral load data quality.

Table 4.12: ***Distribution of respondents' response to inaccurate viral load data in their program***

		Greatly disagree (n)	%	Disagree (n)	%	Undecided (n)	%	Agree (n)	%	Greatly agree (n)	%
Encountered inaccurate data during the decision-making process	Coptic Hope Center	0	0	5	20	3	12	11	44	6	24
	Lea Toto	0	0	2	8	2	8	13	52	8	32
Inaccurate data has hindered me from routinely using data to make decisions	Coptic Hope Center	3	12	13	52	7	28	2	8	0	0
	Lea Toto	1	4	9	36	9	36	6	24	0	0
I take corrective action to address noted data accuracy issues before use	Coptic Hope Center	0	0	0	0	0	0	14	56	11	44
	Lea Toto	0	0	0	0	0	0	20	80	5	20
I have used/relied on other data sources and not routine health data to make decisions	Coptic Hope Center	2	8	14	56	0	0	8	32	1	4
	Lea Toto	2	8	8	32	0	0	13	52	2	8

Source: Researcher, 2018

Table 4.12 showed that majority (68 percent from the Coptic Hope Center program and 84 percent from the Lea Toto program) agreed that they have encountered inaccurate data while using data for decision-making. Further, 24 percent of the respondents at the Lea Toto program reported that inaccurate data has hindered the routine use of data for decision-making, which

compared to 8 percent of the respondents at the Coptic Hope Center program. All respondents from both programs agreed that they take corrective actions to address noted data accuracy issues before data is used for decision-making. Majority (60 percent) of the respondents from the Lea Toto program reported that they have used data from other sources other than viral load monitoring system to make viral load related decision possibly because of the inaccurate data in the viral load monitoring system compared to 36 percent of the respondents at the Coptic Hope Center program. Likewise, the majority (64 percent) of the respondents from the Coptic Hope Center program reported that they rely on the data generated from the viral load monitoring system to make viral load related decision compared to 40 percent of the respondents from the Lea Toto program.

4.7.2 Viral load data completeness

Using a Likert scale of 1-5 where greatly disagree-1, disagree-2, undecided-3, Agree-4, greatly agree-5 respondents were asked to indicate the extent to which they agree or disagree with the following characteristic of viral load data quality.

Table 4.13: ***Distribution of respondents' response to viral load data completeness in their program***

		Greatly disagree (n)	%	Disagree (n)	%	Undecided (n)	%	Agree (n)	%	Greatly agree (n)	%
Data includes all the necessary dataset reports	Coptic Hope Center	1	4	10	40	0	0	14	56	0	0
	Lea Toto	6	24	16	64	1	4	2	8	0	0
Data is sufficiently complete for our needs	Coptic Hope Center	1	4	9	36	9	36	6	24	0	0
	Lea Toto	4	16	17	68	1	4	3	12	0	0

Source: Researcher, 2018

Table 4.13 showed that the viral load dataset collected in the MOH register does not generate sufficient data needed for the decision-making process in the Lea Toto program. Majority (88 percent) of the respondents at the Lea Toto program agreed that the data collected through the manual viral load system does not contain all the report they require for efficient monitoring compared to 44 percent of the respondents at the Coptic Hope Center program. Further, 24 percent of the respondents at the Coptic Hope Center program agreed that the data generated by the electronic viral load monitoring system is sufficient to monitor patients compared to 12 percent of the respondents at the Lea Toto program.

4.7.3 Viral load data Timeliness

Using a Likert scale of 1-5 where greatly disagree-1, disagree-2, undecided-3, Agree-4, greatly agree-5 respondents were asked to indicate the extent to which they agree or disagree with the following characteristic of viral load data quality.

Table 4.14: ***Distribution of respondents' response to the timeliness of viral load data***

		Greatly disagree (n)	%	Disagree (n)	%	Undecided (n)	%	Agree (n)	%	Greatly agree (n)	%
Corrective actions are always taken within a reasonable time	Coptic Hope Center	0	0	5	20	0	0	17	68	3	12
	Lea Toto	1	4	15	60	0	0	8	32	1	4
Data is always available on time for decision making	Coptic Hope Center	2	8	5	20	4	16	11	44	3	12
	Lea Toto	3	12	10	40	3	12	8	32	1	4

Source: Researcher, 2018

Table 4.14 showed that reports generated from both the facilities are reported on a timely basis possibly due to the deadline requirement from the MOH. All facilities within all the sub-counties are required to submit a monthly report by fifth of every month. However, there is no guarantee

of the accuracy of the reports from the Lea Toto program since majority (64 percent) of the respondents agreed that corrective actions on the viral load data are not always taken within a reasonable time before submitting the viral load reports. This is possible because of the workload involved in carrying out corrective measures on the MOH registers. Conversely, the Coptic Hope Center program has an inbuilt data validation system that validates the data before saving the data at the point of care and thus majority (80 percent) of the respondents agreed that corrective actions are always taken within a reasonable time. Further, majority (56 percent) of the respondents agree that the viral load monitoring system at the Coptic Hope Center program generates data on time compared to 36 percent of the respondents at the Lea Toto program, which uses manual viral load monitoring system generates data for decision-making.

4.7.4 Viral load data access

Using a Likert scale of 1-5 where greatly disagree-1, disagree-2, undecided-3, Agree-4, greatly agree-5 respondents were asked to indicate the extent to which they agree or disagree with the following characteristic of viral load data quality.

Table 4.15: ***Distribution of respondents' response to access to viral load data***

		Greatly disagree (n)	%	Disagree (n)	%	Undecided (n)	%	Agree (n)	%	Greatly agree (n)	%
It takes time to find the required data to make timely decisions	Coptic Hope Center	4	16	13	52	0	0	5	20	3	12
	Lea Toto	0	0	1	4	0	0	18	72	6	24
Data is stored in a way that is difficult to access	Coptic Hope Center	1	4	7	28	0	0	7	28	10	40
	Lea Toto	3	12	5	20	0	0	9	36	8	32
I have limited capacity to understand the data	Coptic Hope Center	5	20	13	52	0	0	7	28	0	0

	Lea Toto	3	12	10	40	0	0	12	48	0	0
Available routine health data does not support my tasks	Coptic Hope Center	10	40	14	56	0	0	1	4	0	0
	Lea Toto	6	24	9	36	0	0	10	40	0	0

Source: Researcher, 2018

Table 4.15 showed that it takes longer to generate data for use to make a decision at the Lea Toto program as indicated by majority (96 percent) of the respondents compared to the Coptic Hope Center program where majority of the respondents (68 percent) reported that they disagree that it takes longer to find the required data for decision-making. Further, data from both of the programs are easily accessible (68 percent for the Coptic Hope Center program and 68 percent for the Lea Toto program). The Coptic Hope Center program uses an electronic medical record that has a module for generating different viral load data whereas the Lea Toto program uses MOH registers that can be assessed by the service provider. The study also revealed that a majority (48 percent) of respondents at the Lea Toto program have limited understanding on how to use data to make a meaningful decision while most (72 percent) of the respondents at the Coptic Hope Center program reported that they have basic understanding of data to make a meaningful decision from the viral load data. Respondents were also asked if the available viral load data supports their daily decision task. Majority (40 percent) of the respondents from the Lea Toto program agreed that the available data does not support their daily routine tasks. A majority (96 percent) of the respondents from the Coptic Hope Center program reported being conversant with the use of viral load data generate for decision-making compared to respondents from the Lea Toto program.

4.8 Discussion

The findings revealed that most of the staff employed in both programs is of relatively young age. Majority of this population has a diploma as the highest level of education. Due to a younger age, most of them have fewer years of experience though staff at the Lea Toto program had longer years of experience than the Coptic Hope Center program. The Coptic Hope Center program has a well elaborate viral load monitoring system that allows data entry at the point of care. The system also allows the service provider access to the dashboard, which gives a summary of the viral load progress at the patient level and at the program level. This helps the service provider to make an impromptu decision-based evidence from the data. Conversely, the Lea Toto program has a manual viral load monitoring system that utilizes both MOH registers and patient files to track both patient-level viral load and program progress. This renders the process of tracking viral load progress difficult due to the complexity of retrieving and synchronizing the data to make meaningful information for decision-making. This is a clear indication that the method used for viral load data collection is a contributing factor to the effectiveness of the viral load monitoring system.

The findings further revealed that supportive supervision and data audit is carried out in both programs by the agency appointed by donor annually. The process and procedures for the supervision and data audit are similar in both programs. Respondents felt that the supervision improves the credibility of the data collected since the process is aimed at identifying gaps in the data collection system by pointing out areas that need improvement. This sequentially improves the service providers' trust in the generated data. This is an indication that supportive supervision and data auditing contributes to the effectiveness of the viral load monitoring system.

Whereas both the Coptic Hope Center and the Lea Toto programs embrace various methods for disseminating the viral load data downwards, the different methods affect utilization and hence the effectiveness of viral load monitoring system. This is revealed as majority of the respondents at the Coptic Hope Center program reported using data for decision-making compared to the Lea Toto program whose majority respondent to periodically use data for decision-making. The Coptic Hope Center program has managed to disseminate the viral load data to most of the staff as well as involving majority (76 percent) of the staff in decision-making. Respondents reported that heavy workload, inaccurate data, incomplete data, unavailable data, access of the necessary data are some of the factors reported to hinder the use of viral load at the Lea Toto program, which uses manual viral load monitoring system. This has resulted in the use of unorthodox methods for decision-making like the use of experience/gut feeling and personal liking

CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter presents the summary findings, conclusion and recommendations from the study. The chapter begins by summarizing findings of the assessment of the viral load monitoring systems at the Coptic Hope Center and the Lea Toto programs the conclusion on the various components of an effective viral load monitoring system and finally recommendations for the improvement. The chapter concludes by making recommendations for further research.

5.2 Summary

The study also observed that the Coptic Hope Center program had a well elaborate electronic medical records used to track viral load progress. It is relatively easy to use its functions, more efficient and generate accurate data. It is user-friendly and has a good built-in data quality features. However, staff in the program department need a further capacity building to fully understand how to navigate through the system and make good use of the various modules in the system. Overall, with the increase in viral load data complexity, the volume of patients served and the desire to improve on the patient outcome, the EMR system at the Coptic Hope Center program provides an effective way to strengthen data management and use of data for decision-making. The Lea Toto program, on the other hand, uses a manual system. The program uses

patient files and viral load register to track the viral load progress. The voluminous patient files are as a result of filling a questionnaire for every session a patient has with a service provider. This makes it very difficult for the service provider to make an informed decision quickly at the point of care based on the viral load data and thus inhibit demand for information.

Further, the study observed that supportive supervision is conducted by the Center for disease control (CDC-Kenya) in the two programs by use of standardized checklist christened SIMS facility master tool. However, there is need for an improvement plan to help build the capacity of staff collecting the viral load data and by extension, improving on the quality of the data collected. At the Lea Toto program, feedback of the supportive supervision is not systematically shared with staff at the lower level and if any feedback is provided, it often focuses on correcting the accuracy of data. The study further observed that supportive supervision was effective in improving the credibility of the data. Majority of the respondents from the Coptic Hope Center program in comparison to the Lea Toto program reported having realized an increased utilization of viral load data for decision-making as a benefit of supportive supervision conducted in their programs.

The study findings observed that although a majority of the staff in both programs mostly use the viral load data for viral load related decisions, a sizeable proportion of staff at the Lea Toto program does not always rely on the viral load data to make decisions. Some decisions are based on gut feelings while others are based on the preferences of the decision-maker. Some stated that they are overwhelmed by the workload and the voluminous nature of patient files prompt them to resort to drawing decisions which are not based on data. At the Coptic Hope Center program, various methods of disseminating information downwards include but not limited to displaying

updated run charts on the wall that show the progress of viral load whereas, at the Lea Toto program, viral load charts are displayed on notice boards. However, while departmental representatives are involved in dissemination forums at the Coptic Hope Center program, only managers attend these dissemination forums. Further, quality improvement meetings, which are aimed at addressing gaps identified, are attended only by members of the working improvement team (WIT). This further widens the knowledge gap in the utilization of the viral load data among staff at a lower level. Findings from the study further revealed that with lack of data demand and utilization, some decisions at the Lea Toto program are based on directives from the superiors. They also felt that some decisions made are directives from their superiors and not evidence from the data. Other decisions are based on donor demands as is noted from the study findings. It further observed that some weakness in data quality has contributed immensely to the utilization of viral load data.

5.3 Conclusion

Existing viral load data collection systems affects the quality of the data generated. An electronic viral load data collection system is attributed to an effective viral load monitoring system. The system should also have a simplified functionality that makes it easier for the end users to navigate through different modules and allows the service provider to generate a point of care viral load reports. The findings showed that paper-based monitoring system contributes to poor data quality and thus compromises delivery of healthcare services.

Supportive supervision on the viral load data should be an integral part of the viral load monitoring system since it improves the credibility of the viral load data, as well as, improves on the utilization of information generated from the viral load monitoring system for decision-

making. It is, therefore, imperative to conduct supportive supervision continuously to achieve maximum impact. By improving a program's capacity to generate quality data, supportive supervision also contributes to the larger goal of strengthening a patient's viral load monitoring system.

Feedback of supportive supervision should be given to the organization at the end of the process. Further, an improvement plan based on the feedback agreed on by all the stakeholders should be developed and continuously monitored for implementation. The study observed that when feedback dissemination forums do not include all the relevant service providers, this will hinder ownership of such data by service providers and as such, they will collect the information as an obligation by the employer and not for utilization for decision-making.

Effective viral load monitoring system entails disseminating the viral load information downwards, empowering on ways of utilizing the viral load data and encouraging ownership of the viral load data. The study further noted that heavy workload, lack of knowledge on how to convert data into meaningful information hinder viral load users from utilizing the data, and thus they resort to other non-conventional means of decision-making. Further, lack of creating demand for data was noted as one of the hindrances for effective viral load monitoring system. When a program creates a culture of making decisions based on non-conventional means, such as using gut feelings, directives from "above" or based preferences of the decision-maker, then the decisions will be characterized by ambiguity and inconsistency.

Characteristics of data quality also affect the utilization of the viral load data for decision-making. Low quality of viral load data will negatively influence the utilization of the viral load data. There

will be lack of "trust" on the data when services providers experience inaccurate, incomplete or untimely availability of data needed for decision-making. It is therefore important to ensure there is an effective protocol to ensure that inaccurate data is corrected in a timely manner and periodic inspection of the viral load register is in place.

5.4 Recommendations

In view of the findings from the study, the following recommendations are made on the factors that influence the effectiveness of the viral load monitoring system. The study makes recommendations for policy and programs and for future research.

5.4.1 Recommendation for policy and programs

Strengthening viral load data collection system: HIV programs should develop a viral load policy and strategic plan to guide in the upgrade of the manual system to an electronic viral load data collection system in all the HIV programs. This policy should have plans on how to build the viral load data collection system, strengthen the use of the viral load information and the application of information technology in viral load data management. This will ensure that there is uniformity in the collection of the viral load data and the simplicity of the system. Further, it will ensure that there is quality viral load information is available for use for decision-making.

Review and strengthening of Feedback Mechanisms: The feedback mechanisms within the programs should be reviewed periodically and enhanced to ensure that all health workers in the different program levels receive timely and appropriate feedback. Feedback should be positively delivered, as this can be a very sensitive issue. Further, programs should explore simpler, fast and innovative ways of sharing feedback within the program including exploring electronic avenues.

Promote a culture of data utilization: Programs should develop a set of activities that should promote a culture where viral load related decisions are made based on the viral load data. This includes creating awareness of the importance of using viral load data, also, it involves creating ownership of the viral load data by the service providers.

Improve data quality: programs should further create protocols for data correction, which will ensure that the data collected can effectively be used for decision-making. This will increase the confidence in the viral load data users

5.4.2 Recommendation for further research

This study has investigated factors that influence the effectiveness of the viral load monitoring systems; a comparative study of two HIV programs. A similar study can be carried out in programs that use a similar viral load data collection system.

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APPENDICES

Appendix I: Letter of introduction

Richard Ngomoa Sammy,

P.O BOX 52125-00505,
Nairobi.

2nd April 2018

Dear Sir/Madam,

Re: data collection for study on factors influencing effectiveness of the viral load monitoring system in HIV programs: comparative study of the Coptic Hope Center and the Lea Toto programs.

I am a Masters student at University of Nairobi undertaking studies for a Master of Arts in Monitoring and Evaluation of Population and Development Programmes. As part of my course, I have submitted a proposal to undertake a research study entitled**; "Factors influencing effectiveness of the viral load monitoring system in HIV programs: A comparative study of Coptic Hope Center and Lea Toto program".** This is a case study research, with Coptic Hope Center and Lea Toto program selected as a Case for the study. The methodology proposed by the study is to collect information by means of reviewing Program documents and conducting structured interviews with a discussion guide.

This letter is meant to kindly request for your authorization and assistance to collect data for the study through two approaches; Interview guided by a discussion guide which targets program

managers/Officers and M&E/Data/Information staffs. I will lead the structured interview and it will take between 10-15 minutes. Then review of documents will be guided by a structured questionnaire, I propose to review the following documents; SIMS reports, Data training report, Viral load data collection tool, M&E plan and any other document that will be useful for this study.

Attached, find a copy of the questionnaire to be used. Thank you in advance.

Appendix II: Questionnaire

This questionnaire aims at factors influencing viral load monitoring system in HIV programs. The questionnaire is designed to collect data that will help to achieve the objectives of this study. I would be most grateful if you would kindly participate in this study by responding to all the questions in this questionnaire as candidly and precisely as possible. Your honesty and co-operation in responding to these questions will be highly appreciated. All information provided will be treated with utmost confidentiality.

Please fill in the required information in the spaces provided.

Questionnaire Number { }

Date of Interview (DD/MM/YYYY): ____/____/_____

Name of the facility: ……

County of the facility: ……

1. Background Information

1.1 Gender: Male { } Female { }

1.2 Age in Years: Below 20 { } 21-30 { } 31-40 { } 41-50 { }
51-60 { } Above 60 { }

1.3 Department of the health worker……

1.4 Highest level of education O-Level { } College { } Certificate { }
College { } Diploma { } University Degree { }

1.5 Number of years at your present job station: { }

(This section is for staffs in the clinical or M&E/Data/Information departments)

(If the interviewee is in M&E/Data/Information department, go to Q2.1 else go to Q2.5)

2 Data Collection System

2.1 What type of data collection system for viral load do you have in your facility?

i. Electronic Data Collection System
ii. Paper-Based
iii. Both

2.1.1 If Electronic, on a ritcher scale of 1- 5 (5 being very easy), rate the system in terms of how easy it is to understand its functionalities.

i. Very difficult
ii. Difficult
iii. Average
iv. Easy
v. Very Easy

2.2 Does your facility have a detailed data collection plan? *(That shows the indicators, definition of the indicator, source document, person responsible)*

i. Yes { } *(Should provide evidence)*
ii. No { }

2.3 Do you do viral load data entry?

i. Yes { }
ii. No { }

2.3.1 If yes, in the last 12 months, have you attended any training on data?

i. Yes { }
ii. No { }

2.3.2 If No, are you involved in documenting data on viral load?

i. Yes { }

ii. No { }

2.3.2.1 If yes, in the last 12 months, have you attended any training on data?

i. Yes { }

ii. No { }

2.4 What data processes are there to ensure the quality viral load data is maintained? (Tick all that applies)

i. Running verification code to flag error { } Coptic

ii. Hold data meetings to review data quality { } Coptic

iii. Using restrictions during data entry { }Coptic

iv. Using check list and signoffs { }

v. Others (Specify): …….

2.5 Does your facility have a national-based template for viral load?

i. Yes { }

ii. No { }

2.5.1 If No, how is the decision on what viral load data to collect arrived at?

i. Determined by M&E department

ii. **All** relevant staff meet and decide

iii. The managers

iv. Others reason (Specify): _____

2.5.1.1 Are your opinions considered when updating the viral load data collection tool?

i. Yes { }

ii. No { }

2.6 What is your opinion on the entire viral load data collection system?

i. It is sufficient for collecting all the relevant viral load data { }

ii. Something needs to be done to improve the system { }

iii. The system needs to be simplified { }

iv. There's need for a complete overhaul of the system { }

v. It does not meet the needs of all the viral load requirement { }

vi. Others (Specify)…….

(This section is for staffs in the M&E/Data/Information department)

3 Data Supervision and Auditing

3.1 In your program, do you have a guideline to support M&E supervision on viral load data?

i. Yes { } *(Show evidence)*
ii. No { }

3.2 In the last quarter, has supervision and Data audit on viral load data carried out in your facility?

i. Yes { } *(Show evidence)*
ii. No { }

3.2.1) If yes, in a scale of 1 to 5, rate the following benefits of the supervision

(Greatly disagree=1, disagree=2, undecided=3, agree=4, greatly agree=5).

Benefits	1 2 3 4 5
Improve the credibility of the data	
Build program implementers' capacity in routine data collection and capture, and in using data to improve their own programs	
Improve the use of information for decision making,	

3.2.2 If yes, are you provided with feedback on the supervision and the data auditing?

i. Yes { }
ii. No { }

3.2.2.1 If No, why? ……..

(This section is for staff in program or clinical department)

4 Data dissemination and use

4.1 In your facility, how frequently do you use viral load data to make all the viral load related decisions?

i. Always { }
ii. Most Times { }
iii. Rarely { }
iv. No { }

4.1.1 Do you understand by the term 'Indicator'?

i. Yes { }

ii. No { }

4.2 How is the viral load data disseminated down the facility?

i. Holding dissemination forums

ii. Through conducting meeting

iii. By displaying viral load charts on the wall

iv. Through emails

v. Others (specify) …….

4.3 Do strategies or plans change as a result of the information collected through the monitoring system?

i. Yes { }

ii. No { }

4.4 On a scale of 1 to 5, rate the following factors that might hinder the use of viral load information in your facility?

(Greatly disagree=1, disagree=2, undecided=3, agree=4, greatly agree=5).

Factors	1	2	3	4	5
Feels there are no benefits of using data					
Overwhelmed by workload					
Do not feel/not involved as part of the decision maker					
Lack knowledge of how to use data					
Others(specify)					

4.5 On a scale of 1 to 5, rate the following statement that relates to viral load data **accuracy**.

(Greatly disagree=1, disagree=2, undecided=3, agree=4, greatly agree=5).

Factors	1	2	3	4	5
I have encountered inaccurate data during decision-making process					
Inaccurate data has hindered me from routinely using data to make decisions					
I take corrective action to address noted data accuracy issues before use					
I have used/relied on other data sources and not routine health data to make					

decisions	
Others(specify)	

4.6 On a scale of 1 to 5, rate the following statement that relates to viral load data **Completeness**.

(Greatly disagree=1, disagree=2, undecided=3, agree=4, greatly agree=5).

Factors	1	2	3	4	5
Reported data includes all the necessary dataset reports					
Reported data is sufficiently complete for our needs					
Reported data summarizes the work of the department					

4.7 On a scale of 1 to 5, rate the following statement that relates to viral load data **Timeliness**.

(Greatly disagree=1, disagree=2, undecided=3, agree=4, greatly agree=5).

Factors	1	2	3	4	5
Reporting from the facility is always on time					
Corrective actions are always taken within a reasonable time.					
When making decisions, I always use current data.					
Data is always available on time for decision making?					

4.8 On a scale of 1 to 5, rate the following statement that relates to viral load data **Access**.

(Greatly disagree=1, disagree=2, undecided=3, agree=4, greatly agree=5).

Factors	1	2	3	4	5
It takes time to find required data to make timely decisions					
Data is stored in a way that is difficult to access					
Data is inaccessible due to technological limitations.					
I have limited capacity to understand the data					
Available routine health data does not support my tasks?					

4.9 On a scale of 1 to 5, rate the following statement that relates to viral load data **Use**.

(Greatly disagree=1, disagree=2, undecided=3, agree=4, greatly agree=5).

Factors	1	2	3	4	5
There is a facility set of indicators with targets and annual reporting					
I am able to synthesize data into understandable and actionable narrative					

5.0 On a scale of 1 to 5, rate the following statement that relates to viral load data **Communication**.

(Greatly disagree=1, disagree=2, undecided=3, agree=4, greatly agree=5).

Factors	1	2	3	4	5
Facility has identified viral load performance indicators for routine monitoring					
Graphs/charts/data tables are displayed in the departments to show performance					
Facility has the capacity to identify potential target audiences or users of data					
There is systematic communication of data analysis findings through a variety of communication channels					

5.1 On a scale of 1 to 5, rate the following statement that relates to viral load data **Decision-Making process**.

(Greatly disagree=1, disagree=2, undecided=3, agree=4, greatly agree=5).

Factors	1	2	3	4	5
Decisions are based on Personal liking					
Decisions are based on superiors directives					
Decisions are based on facts					
Decisions are based on political directives					
Decisions are based on experience/gut feeling					
Decisions are based on donor demands					

Thank you for your time.

Appendix III: List of documents reviewed

1. Annual progress reports
2. Review meetings reports
3. Quarterly and monthly progress report
4. A sample of internal program meetings minutes
5. Site Improvement Monitoring System report
6. Monitoring and evaluation plan

Appendix IV: Document review and observation tool

Document	Criteria	Yes ✓	No ✓	N/A ✓	Comments
Annual progress reports	There is an updated annual progress report				
Review meetings reports	Current minutes are present				
Data collection system	Data management guideline exits				
	There is no duplication in data collection				
	Provides easy access for patient monitoring				
Site Improvement Monitoring System report	There is a SIMs report and scores				
	There is an improvement plan after the SIMs visit				
	There exist feedback minutes				
Monitoring and evaluation plan	There exists an M&E plan				
	Copies of quarterly and monthly progress report				
	There exist dissemination meeting minutes				