# DATA QUALITY VALIDATION AND PERFORMANCE OF DONOR-SUPPORTED HEALTH FACILITIES IN SIERRA LEONE: A CASE STUDY OF SELECTED HEALTH FACILITIES SUPPORTED BY SOLTHIS IN SIERRA LEONE

**Joseph Sama Gassimu**

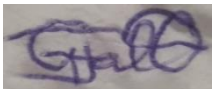
**A Thesis submitted in Partial Fulfilment of The Requirements For The Award Of The Degree Of Masters Of Arts In Monitoring And Evaluation, School of Business Of Africa Nazarene University**

**2025**

## DECLARATION

I declare that this research proposal is my original work and it has not been submitted for any award to any university

Name: _____Joseph Sama Gassimu_____ Admin Number:____21J01DMME011_____

Student Signature_________ Date___11th February, 2025_____

Supervisor name: __Dr. Stephen Kamau Supervisor signature: __________

Date: _____11th February, 2025_____

Supervisor name: __Dr. Nderitu B. Wanjiru Supervisor signature: _____

Date: _11th February, 2025_____

## DEDICATION

I firstly dedicate this project to the Almighty God for keeping me healthy and for providing me wisdom to be able to undertake this project. God has been my source of courage and my go to throughout this struggle and he has constantly granted my wishes. I also want to dedicate this to Mrs. Rebecca Kahn Nayak for her support, patience and inspiration. I also want to dedicate this to my family and friends for their support, understanding and courage. You all have been supportive in one way or the order for which I will forever remain grateful.

## ACKNOWLEDGEMENT

I want to acknowledge God Almighty for always guiding my journey, projecting me and always leading me through the right path. I want to also acknowledge my Supervisor Dr. Stephen Kamua for his support throughout this project. His comments have been relied on a lot as learning source and helped to improve my work and skill. To the staff and management to Africa Nazarene University who constantly provided the support required to enrich and complete this academic journey. I appreciate you all. Finally, I acknowledge my course Coordinator, Dr. Nderitu Wanjiru who has relentlessly supported every step of my time at the University. God Almighty will reward you and your family for serving humanity diligently and with all sincerity.

I want to appreciate Mr. and Mrs Gassimu and the entire Gassimu family for your inspiration and support. The experience you constantly shared has been another source of motivation to me. I am appreciative to all including friends who in one way or the other supported me during this journey, I remain grateful to you all.

## TABLE OF CONTENT

**DECLARATION** ----------i

**DEDICATION** ----------iii

**ACKNOWLEDGEMENT** ----------iv

**TABLE OF CONTENT** ----------v

**ABSTRACT** ----------ix

**DEFINITION OF TERMS** ----------x

**LIST OF ABBREVIATIONS** ----------xi

**LIST OF FIGURES** ----------xii

**LIST OF TABLES** ----------xiii

**CHAPTER ONE** ----------1

1.1 INTRODUCTION ----------1

1.2 Background of the study ----------1

1.2.1 Performance of donor supported health facilities ----------2

1.2.2 Data validation ----------3

1.2.3 Data quality audit ----------4

1.2.4 Joint supportive Supervision ----------5

1.2.5 Staff capacity ----------5

1.3 Statement of the problem ----------6

1.4 Purpose of the study ----------8

1.5 Objective of the study ----------8

1.6 Research questions ----------9

1.7 Significant of the study ----------9

1.8 Scope of the study ----------10

1.9 Delimitation of the study ----------10

1.10 Limitation of the study ----------10

1.11 Assumption of the study ----------11

1.12 Theoretical Framework ----------11

1.13 Conceptual Framework ----------14

**CHAPTER TWO ----------16**

2.1 LITERATURE REVIEW ----------16

2.2 Empirical literature review ----------16

2.2.1 Performance of donor supported health facilities ----------16

2.2.2 Data validation ----------18

2.2.3 Data quality audit and the performance of donor supported health facilities ----------21

2.2.4 Joint Supportive Supervision and the performance of donor supported health facilities ---24

2.2.5 Staff capacity and the performance of donor supported health facilities ----------26

**CHAPTER THREE ----------29**

RESEACH METHODOLOGY ----------29

3.1 Introduction ----------29

3.2 Research design ----------29

3.3 Research site ----------30

3.4 Target Population ----------30

3.5 Study sample size ----------31

3.6 Data collection ----------32

3.6.1 Data collection instrument (and/or data collection materials) ----------32

3.6.2 Pilot testing ----------32

3.6.3 Instrument Reliability ----------33

3.6.4 Instrument validity ----------33

3.6.5. Data collection procedures ----------33

3.7 Data processing and analysis ----------34

3.8 Legal and ethical considerations ----------34

**CHAPTER 4 ----------35**

Findings and data analysis ----------35

4.1 Introduction ----------35

4.2 Rate of Response ----------35

4.2.1 Response rate – FGD ----------35

4.2.2 Gender of Respondents ----------35

4.2.3 Designation of Respondent ----------36

4.2.4 Records reviewed ----------36

4.3 Presentation of Research Analysis, Findings and Interpretation ----------37

4.3.1 Influence of data quality audit on the performance of Solthis supported health facilities in Sierra Leone ----------37

4.3.2 Influence of Joint Supportive Supervision on the performance of Solthis supported health facilities in Sierra Leone ----------39

4.3.3 Influence of Staff capacity on the performance of Solthis supported health facilities in Sierra Leone ----------42

4.4 Presentation of qualitative analysis, findings and interpretation ----------44

4.4.1 Influence of data quality audit on the performance of Solthis supported health facilities in Sierra Leone ----------44

4.4.2 Influence of Joint Supportive Supervision on the performance of Solthis supported health facilities in Sierra Leone ----------45

4.4.3 Influence of Staff capacity on the performance of Solthis supported health facilities in Sierra Leone ----------46

**CHAPTER 5 ----------50**

5.1 Introduction ----------50

5.2 Summary of findings ----------50

5.2.1 Influence of data quality audit on the performance of Solthis Supported health facilities in Sierra Leone ----------50

5.2.2 Influence of joint supportive supervision on the performance of Solthis Supported health facilities in Sierra Leone ----------51

5.2.3 Influence of staff capacity on the performance of Solthis supported health facilities in Sierra Leone ----------51

5.3 Conclusion from the findings ----------52

5.4 Recommendation from the findings ----------53

5.4.1 Recommendation for policy ----------53

5.4.2 Recommendation for practice ----------53

5.5 Suggestion for further study ----------54

References ----------55

Appendix 1 Research questionnaire ----------59

Questionnaire ----------59

## ABSTRACT

This study assessed approaches and strategies used in data quality validation and how they influence the performance of those health facilities. The study is based on three objectives: to examine how data quality audit influences the performance of Solthis supported health facilities in Sierra Leone; to explore how joint supportive supervision influence performance of Solthis supported health facilities in Sierra Leone and to understand how staff capacity and performance influence quality service delivery in Solthis supported facilities in Sierra Leone. The theoretical framework covered Data quality Management (DQM) model, Organizational learning theory, Human capital theory and Donabedian model of quality healthcare. The study adopted a mixed method approaches to gather detailed understanding of the research variables and to afford the researcher the opportunity to make appropriate recommendations using evidence. The research site for the study were 35 health facilities supported by Solthis in Sierra Leone. The target population of 350 healthcare Workers comprising of facility In-charges, Midwives, HIV Counsellors and Nurses working in the targeted donor supported health facilities. A purposive sampling method was used to determine study sample and the researcher used questionnaires to collect data from 61 respondents. Open ended questionnaire was administered in person following focus group discussion method to collect primary data and secondary data from the review of HTC and eMTCT registers and summary forms. The research instrument was piloted in Waterloo CHC, a facility with same attribute as targeted donor supported health facilities that was used for this study. To test reliability, the research tools was piloted before actual data collections. Proper authorizations was secured from relevant institution to conduct the study and health facility performance scorecard was used to conduct quantitative data analysis and Atlas ti 23 for qualitative data. The results from the study indicates that data quality audit, joint supportive supervision and staff capacity positively influence the performance of Solthis supported health facilities. The overall average performances of each of the statements used across all data quality validation approaches were good, indicating that data quality audit, joint support supervision and staff capacity building had positive influence on performance. To conclude, the study highlighted the importance of data quality audit, joint supportive and staff capacity building in improving the performance of Solthis supported health facilities in Sierra Leone. To maintain good health facility performance, national data validation guideline and certification policy should be introduced to motivate health care workers performing well. Future research should be conducted at national level to help understand national performance of these data quality validation approaches especially in non-donor supported health facilities. Outcome will help to triangulate further methodology, approaches and strategies to influence policies and other decision-making processes.

## DEFINITION OF TERMS

**Performance of donor supported health facility:** Refers to result or changes that happen in a health facility as a result of donor support be it financially, capacity building or other supports.

**Data validation:** Refers to the process of checking the quality of data using source of data before utilizing the data for any purpose.

**Data quality audit:** Refers to the process of verifying data for accuracy, completeness, consistency and timeliness. The process aims to improve the quality of data by identifying and resolving issues.

**Supportive Supervision:** Refers to the respectful and non-authoritarian process of conducting visit to health facility to monitor how processes are followed in delivery health care including documentation. It is done to help staff to cautiously improve their own knowledge and skills

**Service Delivery:** Refers to the use available resources: systems, workforce, products and finance to provide health care to those in need.

**Health outcomes:** Refers to results: safe care, mortality from delivery care to those in need. This range from diagnosed, treatment provided within the health system.

## LIST OF ABBREVIATIONS

**HIV –** Human Immunodeficiency Virus

**KPI –** key Performance Indicator

**WHO –** World Health Organization

**HCW –** Healthcare Worker

**M&E –** Monitoring and Evaluation

**IDSR –** Integrated Disease Surveillance

**DHIS –** District Health Information System

**DHMT –** District Health Management Team

**CHP –** Community Health Post

**CHC –** Community Health Center

**HMIS –** Health Management Information System

**HF –** Health Facility

**DPPI –** Directorate of Policy Planning and Information

**MOHS –** Ministry Of Health and Sanitation

**MCHP –** Maternal Child Health Post

**NFM –** New Funding Model

**GF –** Global Fund

**HTC –** HIV Testing and Counselling

**eMTCT –** elimination Mother to Child Transmission

## LIST OF FIGURES

Figure 1 Conceptual Framework ----------13

**LIST OF TABLES**

Table 2.1 Summary of review of literature ----------25

Table 3.1 Target population ----------28

Table 3.2 Study sample size ----------29

Tabel 4.1 Gender of respondent ----------36

Table 4.2 Designation of respondent ----------36

Table 4.3 Records reviewed ----------37

Table 4.4 Outcome of Data Quality Audit conducted in 35 Solthis supported health facilities in Sierra Leone ----------38

Table 4.5 Outcome of Joint Supportive Supervision conducted in 35 Solthis supported health facilities in Sierra Leone ----------40

Table 4.6 Outcome on assessment conducted on indicators relating to the 95, 95, 95 WHO targets in 35 Solthis supported health facilities in Sierra Leone ----------43

# CHAPTER ONE

# INTRODUCTION AND BACKGROUND

## 1.1 Introduction

This chapter provides an overview of data quality validation and the performance of donor Supported health facilities in providing Human immunodeficiency virus (HIV) services. This chapter presents the background, problem statement, objectives of the study, study questions, significance of the study, scope of the study, limitations and conceptual framework.

## 1.2 Background of the study

Globally, reliable and validated data plays an indispensable role in reaching universal health coverage, monitoring the progress of health initiatives, and improving service delivery. Incorrect and incomplete data has posed challenge in obtaining accurate overview of health coverage, particularly in low and middle-income nations (Kathrina H, et al, 2020), often leading to suboptimal decision-making, inefficient resource allocation, and poor performance of healthcare facilities and systems. Data quality validation plays an important role in assessing health facility performance, its methods vary from training healthcare workers to checking the availability and accuracy of data to conducting external audits on data quality. Data quality validation helps organizations and health facilities to identify data gaps, improve on those gaps and promote the use of quality data to make informed decisions that influence the performance of health facilities. However, research indicates that data quality issues in sub–Saharan Africa are often attributed to insufficient training of healthcare workers, fragmented reporting systems, and the absence of regular data audits (Mutale et al 2013). In the health industry, data is not just numbers, it's the foundation of critical decisions that affect patient care and outcomes. The accuracy of this data, especially when it pertains to Key Performance Indicators (KPIs), is of utmost importance. Trusting validated data means trusting that our KPIs accurately reflect patient outcomes, resource allocation, and overall system performance (Rejani Mathew, 2024).

Nationally, this study focused on health facilities delivering HIV services supported by Solthis in Sierra Leone to achieve 95, 95, 95 target set by world health Organization (WHO) and which had benefitted from data management interventions supported by Solthis. Solthis is a French INGO established in 2003 but have been operating in Sierra Leone since 2011 on improving access to

quality healthcare, particularly in resource constrained areas, by strengthening health systems and services, with a focus on infectious diseases, maternal and child health and sexual reproductive health. Between 2023 and 2024, Solthis implemented a New Funding Model (NFM) project funded by Global fund to provide technical support in capacitating HCWs to provide quality HIV services and data reporting to improve the 95, 95, 95 targets. That is, 95% of people tested HIV positive should know their status, 95% of people tested positive should be linked to care/initiated on treatment and 95% of clients on HIV treatment should have their Viral Load (VL) suppressed. This project supported 35 health facilities across 7 districts in Sierra Leone. Most of these health facilities that benefitted from the NFM project are primary health care facilities that lacks the capacity to provide quality HIV care and produce quality data for decision making. Through this project, the National Aids Control Program (NACP) of Sierra Leone in collaboration with Solthis selected these 35 health care facilities to benefit from this intervention and improve performance. These facilities were supported with technical support through capacity building to provide quality health care and data reporting. These health facilities recommended by the national Aids control program were also identified as high burden HIV sites that needed capacity building support to generate evidence that will help to measure performance of HIV intervention in those health facilities. The selected health facilities had lots of gaps in updating data collection and reporting tools which made it challenging to assess progress and ascertain the performance of those facilities at health facility, district and national program. The study aims to

explore how data quality validation influence performance of these health facilities providing HIV services in Sierra Leone. The study provides insight on data validation strategies and approaches to help in generating quality data and challenges faced by health care workers (HCWs) in data management during health care service delivery. Findings from the study could be used by the nation AIDs control program, Solthis and other international non-Governmental organizations to improve data validation approaches and strategies. By examining the health facilities supported by Solthis Sierra Leone, the study tried to unearth strategies and approaches used by Solthis in improving the quality of data collected and used in their supported health facilities. Also, by understanding how data quality validation influences the performance of health facilities could inform future implementations, strategies and approaches for improving data management approaches and strategies for documenting quality service delivery and health outcomes. This may also guide Monitoring and Evaluation (M&E) design and implementation practices that will effectively monitor and measure progress and impact of health projects, which will influence informed decision-making processes and appropriate resource allocation for future implementations.

Generally, this study will apply a multidimensional approach to address the global, regional and Sierra Leonean contexts, by providing insights into data quality validation in enhancing the performance of health facilities and contributing to the broader goal of documenting quality service delivery and health outcomes to enhance decision making.

### 1.2.1 Performance of Donor supported Health Facilities

This can be measured by indicators such as health service delivery, Data quality improvement and staff performance and motivation etc. Health Service delivery encompasses the accessibility, availability and quality of health services provided to patients. Effective donor support and data validation systems improve service delivery by ensuring accurate reporting, timely resource allocation, and evidence-based decision-making. The role of international donors must not be underrated. Some donors have incorporated data quality assessment into their performance-based financing model as a requirement and others must be encouraged to follow the same (Kathrina H, et al, 2020). In Uganda, donor-funded initiatives that utilized robust data quality mechanisms improved patient attendance rates and service response times (Okwero et al., 2010).

Data quality improvement are the measurable changes in the quality of health care data generated during service delivery such as, completeness, accuracy, consistency and timelines of data. Reliable data quality ensures accurate tracking of health outcomes, enabling facilities to measure the impact of interventions. According to (WHO 2019), donor-supported facilities that implement robust data validation systems report better maternal and child health outcomes. In Malawi, donor-supported initiatives focused on maternal health saw a 30% reduction in maternal mortality due to improved data-driven interventions (Chimwaza et al., 2014).

The performance and motivation of healthcare workers are crucial to facility success. Key metrics include productivity, adherence to protocols, and job satisfaction. Data validation systems reduce administrative burdens and improve workflows, allowing staff to focus on patient care. According to (Felix. 2023), proper support systems enhance staff adherence to guidelines, thus boosting performance. In Sierra Leone, donor-supported training and data-driven decision-making were associated with a 15% increase in staff productivity (Kamara et al., 2020).

### 1.2.2 Data quality validation

Data validation methods vary from training healthcare workers to checking the availability and accuracy of data to conducting external audits on data quality. Many initiatives aimed at improving data quality in global health, supported by various donors, non-governmental organization, foundations and host countries, focus on disease-specific indicators and rely on ongoing external funding (Glassman A, 2011). In Mozambique, various activities were conducted to assess data quality, such as supportive supervision, training, dashboards, and data quality audits. 146 healthcare facilities were considered for a study in the province of Sofala in Mozambique (with a population of 1,500,000) and all had already received some support in the form of Data Quality Audit (DQA). Yearly data quality audit was conducted in 26 sampled Healthcare facilities, which included the biggest healthcare facility, two added sites in each district, and the regional quaternary-level healthcare facility. In Rwanda, project PHIT focused on two districts, namely Kirehe and southern Kayonza (with a population of 460,000) in the eastern part of Rwanda. These districts received targeted support to enhance data quality and utilization, involving 21 healthcare facilities and two district level hospitals. In Zambia, the project targeted three rural level districts in Lusaka Province: Kafue, Chongwe and Luangwa (with a population over 300,000). A total of

42 healthcare facilities in these districts were selected for DQA interventions (Rwabukwisi et al., 2017).

In Sierra Leone, Integrated Diseases Surveillance and Response (IDSR) system was first implemented in 2007. However, this system relied on paper-based methods, resulting in poor-quality data and limited utilization. In 2018, Sierra Leone enhanced the adoption of electronic IDSR and introduced case-based disease surveillance on the DHIS2 platform to promote data utilization. The goal is for 90% of public health facilities to report weekly surveillance data on priority diseases based on the IDSR 3rd Edition by 2022, with approximately 20% reporting case-based data, including COVID-19 (B. Magoba, 2022). Routine health data from the health facilities in Sierra Leone, which is organized at districts level by the district health management Team (DHMTs), are collected and stored in the District Health Information System (DHIS2) has proven some data quality and reliability issues. Government and Non-governmental Organizations (NGOs) have applied several approaches in improving the quality of data collected and reported at different levels. These approaches included an intervention to improve completeness, correctness, consistency and timeliness of the public health data routinely recorded at healthcare facility level and the District Health Information System (DHIS).

#### 1.2.2.1 Data Quality Audit

For early detection of outbreaks, agencies working on public health require correct, complete, consistent and timely health related information. Challenges faced in producing quality public health data are not well documented in Africa. An underreporting of 5.4% of clients receiving HIV treatment was found in Malawi (WHO, 2019). In the Prevention of Mother to Child infection of HIV project healthcare facilities in South Africa, more worsen situation of 75.2% was reported (WHO, 2019)

The Ministry of Health and Sanitation (MoHS) in Sierra Leone revitalized the Integrated Disease Surveillance and Response System (IDSR) towards the end of the Ebola Virus outbreak in 2015. The accuracy of IDSR data was monitored by conducting Data quality assessments**.** The percentage accuracy of reports generated was almost the same across all healthcare facility categories and data received from Community Health Posts (CHPs) recorded the highest (52.5%), Out of 49 reports received from healthcare facilities and clinics owned by NGOs, 19 (38.8%) recorded over-reporting. Under-reporting was very common in reports from CHPs (29%) and

Maternal child health posts (28.5%) (Martin D. M, et all, 2020). Generally, there was an improved data accuracy from over reporting of 4.7% (VF of 95.3%) in the first assessment to under reporting of 0.2% (VF of 100.2%) in the fourth assessment. This may have happened as a result of the extensive dissemination of outcome from the DQA undertaken by the MoH. Improvement in the accuracy of data observed from the assessment shows that the regular data quality validation may have contributed positively to the accuracy of data and is consistent with findings from repeated DQAs conducted in other places (Muthee V, et al J, 2019).

#### 1.2.2.2 Joint Supportive supervision

To optimize high quality data generated in the health care system, participatory healthcare facilities should follow specific procedures designed to maximize accurate, complete, and consistent data. Conducting data validation exercises through regular supportive supervision and mentorship and providing regular feedback to those providing healthcare data are essential approaches to ensure quality data and information are available and used for decision making. However, implementing supportive supervision is not regular and guidelines are not consistent (Gonete, et all, 2021).

Data management in the health care system in Sierra Leone is segregated by levels, the monitoring and evaluation teams at both district and national levels are responsible for updating the electronic HMIS system, monitoring of data quality, and use of information, collaborate with the clinical team in conducting joint supportive supervision and providing feedback, development of different policies and procedures with other relevant departments and committees, analyzing and reporting hospitals performance. However, data quality challenges still occur, even with these efforts made to improve data quality. Data accuracy, completeness, timeliness, consistency, and the use of information for informed decision making and performance improvement still remains a problem

#### 1.2.2.3 Staff capacity building

Capacity building involves training healthcare workers to improve skills, knowledge, and service delivery including data management. Donor support for training ensures that healthcare workers are equipped to handle complex healthcare needs. According to Blessing Magocha et al, 2024, Capacity building is vital in managing HIV and AIDS, as it may foster resilience, enhance access to healthcare services, and promote education and awareness.

Ongoing success towards controlling the HIV and AIDS epidemic and other disease conditions could be enhanced by capacity building of the community and health workers (Robinson et al., 2024; Tshiyoyo, 2022). However, scant information is available about the performance of such programs. In Tanzania, donor-supported training programs enhanced healthcare worker competencies, resulting in a 20% improvement in service delivery quality (Leonard et al., 2007).

### 1.3 Statement of the problem

Data quality validation is a crucial process that involves incorporating various examination into a system or report to ensure the logical consistency of data inputted and stored (Rizopoulos & Taylor, 2024). In automated systems, data is often entered without much human supervision, making it imperative to verify the accuracy and adherence to desired quality standards. If data is not entered correctly, it can lead to significant downstream reporting issues, rendering the data practically useless. Even if unstructured data is entered accurately, it still incurs additional costs for cleaning, transforming, and storage (Rizopoulos & Taylor, 2024). If the data quality level is high, a healthcare organization can be competitive. Maintaining high data quality has various advantages for healthcare organizations, including informed decision-making, better patient targeting, improved patient-physician relations, straightforward data implementation, and higher profitability (Schopf et al., 2019). As countries strive to achieve the United Nations Millennium Development Goals, it is important to explore approaches that can help improve data analysis in a healthcare organization when examining the data quality problem (Schopf et al., 2019; Uslu and Stausberg, 2021). Moreover, funding and support for public health initiatives and programs, mostly rely on routine statistics demonstrating coverage. However, ensuring the quality of health information systems continues to pose a challenge.

Studies conducted on public health information systems in low-resource countries often highlight issues related to data quality, including incomplete records and delayed reporting (Chaulagai et al., 2005). Despite the challenges, these systems serve as crucial source of data for the continuous monitoring of healthcare programs. Various initiatives have been implemented to enhance the quality and administration of public health information systems in developing nations. Nevertheless, the intricate structure of health information systems and the high expectations placed on them have hindered progress in enhancing the accuracy of routine data (Ensor et al., 2014).

Informed decision-making to promote performance are enhanced by producing quality data. However, data is often incomplete, inaccurate, inconsistent, and untimely. As a result, developing countries do not use data effectively for decision-making. Data quality and utilization of health information are still low in Sierra Leone, especially in primary healthcare facilities and district levels. The Sierra Leone Health Management Information System (HMIS) is supported by both paper-based and electronic recording and reporting systems. The paper-based HMIS is intended to capture patient-level and case-based information and summary reporting forms as the source of the electronic HMIS. On another hand, the electronic HMIS is used to record aggregated data from the health facility (HF) registers every month. Both the paper-based and electronic HMIS have different components of the health care system: Inpatient, Outpatient, human immunodeficiency virus (HIV), Tuberculosis (TB) etc. The data elements reported are different according to the level of care and are designed based on the components they are intended to be used for. The Directorate of Policy, Planning, and Information (DPPI) in Sierra Leone and its partners are working on strengthening evidence-based decision making in all health sectors and organizations. However, at the HF level, healthcare workers (HCWs) at different levels pay low attention to data management and evidence-based decision-making. As a result of this, there are poor practices of registering, tallying, timely reporting, and a sense of ownership for facility-level HMIS implementation, which leads to under and over reporting that greatly impacts national HMIS data quality and inappropriate decision-making.

In practice, however, quite frequently, incorrect patient data are registered or data items can be inaccurately recorded or not recorded at all. To optimize the quality of data generated in the health care system, participatory health facilities should follow specific procedures designed to reduce inaccurate, incomplete, and inconsistent data. Conducting data validation exercises, regular supportive supervision and mentorship and providing feedback to the providers of the health data are important approaches to ensure quality data and information are produced and used for decision making.

The monitoring and evaluation teams at both district and national levels are responsible for updating the HMIS system, monitoring data quality, and information use, conducting supportive supervision and providing feedback, developing different policies and procedures with other departments and committees, analysing and reporting hospitals performance. However, there are

still data quality challenges, even with the different efforts made to improve the quality of data. There are still problems in data accuracy, completeness, timeliness, consistency, and use of information for informed decision making and performance improvement (Gonete et al., 2021). This study aims to investigate how data quality validation influences the performance of donor health facilities and the underlying reasons behind challenges in data management processes in Solthis supported health facilities, despite the organization's learning culture, and explore the impact of data quality audit, staff Capacity building and training, and joint supportive and other M&E practices in those health facilities. By addressing these gaps, the study seeks to influence data quality validation approaches and strategies to improve the overall performance of Solthis supported and other health facilities.

### 1.4 Purpose of the study

The purpose of the study is to investigate data quality validation and the performance of Solthis supported health facilities in providing HIV service delivery in Sierra Leone. The study aims to assess approaches and strategies used in data quality validation and how they influence the performance of those health facilities. The study also propose recommendations for improving data quality issues as well as HIV service delivery at different level in the health care system.

### 1.5 Objective of the study

#### 1.5.1 General Objective

The objective of the study is to assess the influence of data quality validation approaches such as data quality audit, joint supportive supervision and staff capacity building on the performance of donor supported health facility in Sierra Leone.

#### 1.5 .2 Specific objectives of the study

1. To examine how data quality audit influences the performance of Solthis supported health facilities in Sierra Leone**.**

2. To explore how joint supportive supervision influence the performance of Solthis supported health facilities in Sierra Leone

3. To understand how staff capacity building and performance influence quality service delivery in Solthis supported facilities in Sierra Leone

### 1.6 Research questions

The following Research Questions were used to answer the research objectives above:

1. How does data quality audit influence the performance of Solthis supported health facilities in Sierra Leone?
2. How does joint supportive supervision influence performance of Solthis supported health facilities in Sierra Leone?
3. How does staff capacity building and performance influences quality service delivery in Solthis supported facilities in Sierra Leone?

### 1.7 Significance of the study

The study will help to understand data quality validation and the performance of selected health facilities. The study specifically focused on the Solthis supported health facilities in Sierra Leone and identified the influence of data quality audit, joint supportive supervision and staff capacity building on the performance of Solthis supported health facilities in Sierra Leone. The findings from the study could have several influences on National Aids Control Program (NACP) of Sierra Leone, Solthis supported and non-supported facilities and other INGOs operating in health-related field in Sierra Leone.

Firstly, findings from the study will help to inform the development of effective data validation approaches and strategies to improve program outcomes by identifying contributing factors to successful data validation processes. The identification of these approaches and strategies will enable Solthis, Ministry of health of Sierra Leone and other supporting partners to enhance their operations and programs, resulting to better results and impacts in the healthcare system.

Secondly, findings from the study will inform M&E approaches and strategies in data quality validation processes to monitor the performance of other non Solthis supported health facilities in Sierra Leone. Insights from the study could contribute in developing M&E strategies that support effective program evaluation of health sector results, which will lead to improvement in service delivery and health outcomes.

Thirdly, Findings from the study will help to unearth data quality issues and recommendations that will be helpful to improve health care system

Lastly, findings from the study could also inform capacity building approaches that will contribute to data quality management and services delivery that promote positive health outcome

### 1.8 Scope of the study

The study focused on data quality validation for data collected and reported in selected Health facilities and how the process influenced the performance of those health facilities. Retrospective data from January 2023 to September 2024 from the 35 selected health facilities across 7 districts supported by Solthis in Sierra Leone was used for this study. Also, the Study was only limited to available HIV data in health facility registers, summary/reporting forms and DHIS2.

### 1.9 Delimitation(s) of the study

This study was limited to 35 selected Health facilities across 7 districts in Sierra Leone and focused on data quality validation and its performance of selected Health facilities. The 35 selected Health facilities are Health facilities where lots of support have been provided by Solthis in improving the quality-of-service delivery and data collected. It is also limited to healthcare workers working in the selected Health facilities. However, findings from the study will help improve data quality and health facility performance improvement approaches at every level.

### 1.10 Limitations of the study

The research may suffer from selection bias if the chosen health facilities do not represent a diverse or representative sample of the broader healthcare system. This limitation can affect the generalizability of findings and may skew results if certain types of facilities or HCWs are overrepresented or underrepresented. Also, the accuracy, completeness, and consistency of data collected by HCWs depend heavily on the reliability of documentation practices within health facilities. However, variations in documentation protocols, individual HCW practices, and organizational factors can introduce inconsistencies and inaccuracies in the data, undermining the validity of research findings. Lastly, healthcare data systems may be vulnerable to integrity issues such as data entry errors, duplication of records, or data manipulation. Without robust data quality assurance measures and auditing processes, the researcher may struggle to identify and rectify these integrity issues, casting doubt on the trustworthiness and integrity of the data used for analysis.

### 1.12 Assumption of the study

It was assumed that even with the intervention of Solthis in improving the quality of data collected and reported in selected Health facilities, data quality and performance issues were still identified. However, poor data quality was minimal during this intervention.

### 1.13 Theoretical Framework

This study focused on theories relevant to data quality validation approaches and performance of health facility. The selected theories that used for this study are organizational learning theory, which was influenced by Chris Agris and Donald Schon; the human capital theory which was documented by Adam Smith a Scottish economist in the 8th centuries, Donabedian theory of quality healthcare which was originally developed in 1966 by Advedis Donabedian who was a physician and health service researcher at the University of Michigan and finally data quality management model.

The selected theories supported both the study independent and dependent variables focusing on data quality audit, joint supportive supervision and staff capacity building all of which can influence the performance of selected health facilities supported by Solthis in Sierra Leone.

#### 1.13.1 Data Quality Management (DQM) model

The management of data includes theory, terminology, practices and management. Enterprise will be able to obtain quality data as a result of data quality management which is significant in data service provision, data product development and actualizing the value of data. Data quality management is identified as a major component of system data governance (Liang Y., et al 2024). Issues around data quality often arise from human errors, system incompatibilities, outdated entries, inconsistent formatting, and data integration challenges when importing from multiple sources (Rao S., 2024). Dentler et al. 2014 examined the impact of data quality on Dutch hospital quality indicators and pinpointed six major data quality issues within the EMR system they studied. These issues included unstructured data formats, incorrect data entries, incomplete patient histories, a lack of data item relationships, a lack of detail, and the absence of standardization. The study highlighted that these problems hindered the reliable computation of certain quality indicators.

In other study that focused on data quality issues for the secondary use of electronic health records, three main data quality criteria were investigated by Botsis et al 2010: accuracy, completeness and consistency, to examine issues around data quality. Findings showed that inaccuracy, incompleteness and inconsistency were prevalent. completeness as a criterion for measuring data quality was also adopted by Dixon, et al 2013, Sukumar, Natarajan, and Ferrell (2015), and Guy et al 2017 in their respective studies, and all showed some level of data incompleteness.

When considering approaches for improving the motivation and behavioural compliance of those tasked with collecting raw data, an obvious place to start would be ensuring that they have the "right attitude". Attitude in this context refer to the HCW's underlying beliefs concerning the importance of data quality and the need to collect data that, for example, reflects the standards of consistency, accuracy and completeness. One could assume that those with positive approaches help reduce the quality of the data identified during data validation exercises to help measure performance.

### 1.13.2 Organizational learning theory

The influential theory of organizational learning was developed by Chris Agris and Donald Schon. The notion of the theory was based on the fact that learning is done from mistakes made. That is, learning happens from errors detected and corrected. For example, during the process of performing a task and the result are not satisfactory, the person or group you work with will determine the issue and resolve it appropriately. This concept states that learning within an organization occurs when a person interacts with others to find solution (Weinsten S. & Cheprasov A., 2023)

Organizational learning should involve all staff of the organizations, information should be shared and accessible. That is, the organization must ensure to share all available data and important information to members and learning should be emphasised and considered important. Organizations should prioritize training programs by given all members the opportunity to participate and learn. Organizational learning in the healthcare setting explores how organizations especially health facilities and systems learn and adapt to improve healthcare provided to patient to promote organization effectiveness and performance. Organizational learning is considered an ongoing process of creating knowledge, retaining knowledge and applying it instead of using a one-off approach.

### 1.13.3 Human capital theory

Human capital theory is focused on the idea of improving the productivity and efficiency of humans by focusing on trainings and other capacity building approaches. Documentation on the human capital theory was done by Adam Smith a Scottish economist in the 8th centuries (Health & wellbeing, 2024). However, Greg Becker who was an American economist was arguably the biggest pioneer of the theory after coining the theory as an idea of investing in people. Becker's work enhanced human capital in the workplace. Human capital improves qualities such as communication skills, documentation, people management, workplace training, problem solving skills, physical, mental and emotional wellbeing.

Wuttaphan N., 2017 argued that the most invaluable asset capital that firm invest and that human capital seeks to explain the situation from the economics point of view. He also stated that the view of human capital development as a competitive advantage and sustainability in the complex business world that should be achieved. In maintaining a high standard of living knowledge, skill building, and training levels of the workforce must be upgraded. Wuttaphan N., 2017 also states that people joining the labour market brings different skills, knowledge and expectation from the workplace. A personnel with more education and better training can be more productive than another with less or no form of learning and training.

### 1.13.4 Donabedian's model of quality healthcare

Donabedian model was developed originally developed in 1966 by Advedis Donabedian who was a physician and health service researcher at the University of Michigan. There are other quality of care framework such as Bamako Initiative and the WHO recommended quality of care framework. However, the Donabedian model is still dominating in terms of quality of health care assessment (EI Haj H.I, 2013).

The Donabedian Model is a conceptual model which provides platform to examine health services and assess quality of care provided. Information on this model can be drawn from three categories. That is, Structure, process and outcomes. Firstly, structures explain the situation in which care is delivered. That is, resources such as building, staff, finance and equipment. Secondly, process describes the interaction between those receiving health care and those providing health care from

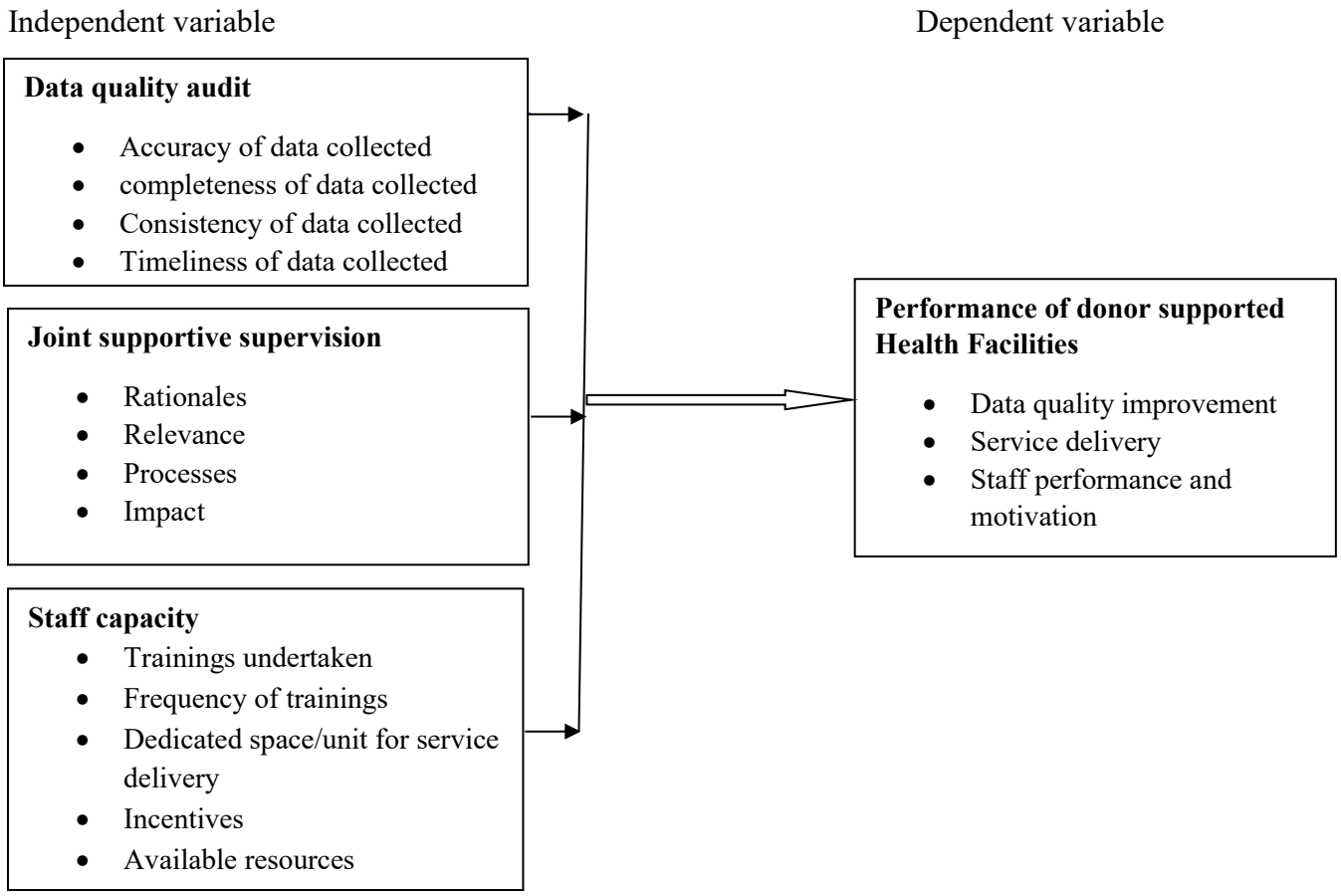
beginning to end of healthcare delivery. Finally, outcome is the result of service delivered to those receiving healthcare and the population (EI Haj H.I, 2013).

The Donabedian model of quality-of-care framework was developed by Donabedian to be flexible and used for different healthcare settings and among various level within a care delivery system. The framework can be used to modify structures and processes in health care delivery units to improve information exchange. The structure will include health information system that these units update after service delivery which can be used for decision making and performance improvement. To help improve health system and performance processes, the healthcare administrator will look at the available information in existing structure such as health information system and rely on them to propose solution to improve processes and performance.

Data validation is used to see the progress of the improvement of the existing model. The results of manual data validation are more precise than the automatic validation. The difference in this case is very settled. During data quality discussion and the process involved from raw data to information, three main occupational groups are key: those collecting or producing data, those analysing the data and those using or consuming data. In a health system context, data collectors are HF-based Health Care Workers (HCWs) tasked with the responsibility of providing direct care, collecting, recording or documenting the raw data in patient charts and registers. While those involved in analysing and utilising the data are at the district and national level.

### 1.14 Conceptual Framework

The conceptual framework is a diagram presenting the relationship between the independent and the dependent variables. The different arrows in the diagram indicates directions of influence and also show the independent variables. The independent variables, which include data quality audit, joint supportive supervision, and staff capacity influence the dependent variable of health facility performance. The dependent variables which include Data quality improvement, service delivery, staff performance and motivation comprises the outcomes of the projects. Other variables can influence the dependent variables but are beyond the control of the independent variables' management.




*Source: 2025 research*

# CHAPTER TWO

# LITERATURE REVIEW

## 2.1 Introduction

Healthcare systems rely heavily on accurate, timely, and complete data to ensure effective service delivery, monitor health outcomes, and improve staff performance. Data validation and quality audits are essential in maintaining high standards of healthcare delivery, especially in donor-supported facilities. This chapter explores the literature on data quality validation, data quality audits, joint supportive supervision, staff capacity, and the impact of these factors on health facility performance, service delivery, staff motivation, and health outcomes. Gaps in the current literature are also identified to guide future research.

## 2.2 Empirical literature review

This section reviews and discusses studies and previous publications exploring related strengths and weaknesses focused on data validation and performance and performance of donor supported health facilities.

### 2.2.1 Performance of donor supported health facilities

The performance of health facilities is directly linked to the quality of their data systems and the capacity of their staff. A Performance metrics include available services and its delivery efficiency. Donor-supported health facilities often exceed baseline performance due to stringent reporting requirements and access to additional resources (Smith et al., 2021). Facilities that integrate robust data validation processes report better outcomes in service delivery and patient satisfaction. For example, donor-supported clinics in Malawi achieved a 30% reduction in patient wait times after implementing automated scheduling systems based on validated data (WHO, 2022). However, disparities in performance persist due to variations in resource availability and staff training. Facilities with limited funding often struggle to maintain high standards of data quality, impacting their ability to deliver timely and effective care (Smith et al., 2021).

Donor-supported health facilities have emerged as critical players in global health, especially in resource-limited settings. These facilities often implement advanced monitoring and evaluation systems to meet donor accountability requirements. For example, the Global Fund has supported

facilities in over 100 countries, leading to significant improvements in malaria and tuberculosis control programs through enhanced data validation processes (Global Fund, 2021).

Donor-supported health facilities often exhibit better performance compared to government-run facilities due to the availability of additional resources and external accountability mechanisms. These facilities frequently implement rigorous data quality assessments to meet donor requirements, enabling better planning and delivery of healthcare services (Smith et al., 2021). However, dependency on donor funding can undermine sustainability when support is withdrawn, leading to lapses in service delivery and data quality practices (Muthee et al., 2019). Studies reveal that donor-supported facilities must focus on building sustainable systems that remain effective after donor withdrawal (Kim et al., 2023). Countries like Rwanda have successfully transitioned donor-supported programs into government-led initiatives, showcasing the potential for sustainability when donor and local efforts align (Chowdhury et al., 2022).

In Kenya, donor-supported facilities implementing electronic health records (EHRs) demonstrated improved reporting accuracy and service delivery. For instance, vaccination programs achieved 92% coverage due to precise tracking facilitated by high-quality data systems (Kim et al., 2023). Despite these successes, challenges such as misaligned priorities between donors and local health authorities persist, necessitating collaborative frameworks for effective resource utilization (Chowdhury et al., 2022).

Accurate data ensures that resources are allocated effectively, reducing service delivery bottlenecks and improving patient outcomes (WHO, 2022). High-quality data enhances service delivery by enabling precise resource allocation and monitoring. In Rwanda, the introduction of data validation systems in maternal health programs reduced neonatal mortality rates by 15% through better tracking of high-risk pregnancies (Jones et al., 2023).

Validated data also supports health outcomes by facilitating early detection of outbreaks. During the COVID-19 pandemic, countries with robust data systems were able to implement targeted interventions, reducing infection rates and improving vaccine coverage (Park et al., 2023). Donor-supported health facilities have reported improved service delivery metrics and health outcomes due to enhanced data validation and staff training. For example, maternal health services saw significant improvements in accessibility and quality post-Ebola, attributed to better data

monitoring systems (Jalloh, 2020). These examples underscore the importance of investing in data systems to enhance public health resilience.

Data validation not only improves healthcare delivery but also positively impacts staff performance. Workers who engage with reliable data systems report greater job satisfaction, as errors are minimized and tasks are completed efficiently (Smith et al., 2021). Recognition for accurate data entry and timely reporting serves as a critical motivator, fostering a culture of accountability. According to a study done, it reveals that enhanced remuneration and performance-based rewards improved motivation and accountability among health workers (Percival et al. 2018). Also, the role of health information systems like District Health Information System (DHIS2) in facilitating performance evaluation, improving data management, and fostering accountability in donor-supported facilities (Nielsen et al. 2012)

However, heavy workloads and inadequate training can demotivate staff, leading to errors and inefficiencies. Addressing these challenges through targeted interventions, such as workload redistribution and advanced training programs, is essential for sustained performance improvements (Adusei et al., 2023).

### 2.2.2 Data validation

Globally, the role of validated data in healthcare systems cannot be overstated. Data validation is integral to achieving operational efficiency, improving service delivery, and enhancing health outcomes. Validated data ensures that healthcare decisions are based on accurate and timely information worldwide. Evidence-based practices depend on high-quality data, and improving validation globally could reduce diagnostic errors by up to 35% (Jones et al., 2023).

The evolution of data validation reflects a shift from manual checks to advanced technological solutions. Globally, the adoption of machine learning and artificial intelligence (AI) has transformed data validation to meet the complexity of modern healthcare systems. Early methods emphasized structured data entry, while current practices prioritize real-time anomaly detection to ensure accuracy and timeliness (Zhang et al., 2023). Globally, data validation employs traditional techniques like pattern control, computational control, and delta control to detect inconsistencies, such as gender mismatches in disease registries (Sohrabi et al., 2022)

Unavailability of quality data in the healthcare sector has far-reaching effects. Planning and delivery of services depend heavily on data from healthcare service delivery, administrative and management sources. Evidence-based practice is facilitated by high-quality data, and requires access to extensive research data collected, collated and presented in a way any medical personnel can use at the time of diagnosis or in other decision-making processes. The higher the quality of the data, the better will be the patient outcomes, improved care delivery and patient safety (Wang et al., 2021). Similarly, quality data, particularly when it comes to accuracy and timeliness, are relevant for administrative purposes such as hospital bed count and for planning services to ensure that they are cost effective. It ensures that planning processes are cost-effective and aligned with healthcare demands (Rojas et al., 2020).

Data quality is directly linked to the use of Information Systems and the health sector is increasingly becoming an information driven service. Recent studies emphasize the integration of artificial intelligence and information systems in healthcare for better data management. Advanced systems enable automated validation, reduce human error, and enhance decision-making capabilities (Smith et al., 2022). However, achieving these benefits requires an organizational commitment to data quality and the implementation of robust data governance frameworks.

A study conducted in New Zealand on data quality information and decision making in health care indicates that, the increase in information intensive nature of business requires a proactive and strategic approach to data quality to ensure that the correct information is available in the correct format, at the right time and to the right person whilst ensuring the confidentiality rights of individuals to have their personal data (especially health data) protected and used following all required ethical considerations.

A data quality framework and approach will help greatly in total data quality management program through an ongoing cycle of work that will regularly improve the quality of data. The addition of contextual metadata will also improve the intelligence density of data so that the integrated program will facilitate better decision-making throughout an organization. With the introduction of artificial intelligence software and appropriate information systems, organization become an intelligent enterprise which will self-adapt, self-heal, and self-manage itself evolving like a biological system to meet the demands of its environment and users with the help of the total quality management program.

It was also discovered from a study that data consumers need more detailed information on how quality assessments were made for each data criterion whereas managers needed only summary information (Chengalur Smith et al., 2003). The aggregation of data quality information to minimize information overload should therefore be allowed by the structure of the framework. A further area of research concerns the presentation of data quality information in an appropriate format that facilitates the effective and efficient decision making.

Data validation employs both traditional and advanced methods/techniques to ensure high quality. Traditional techniques like pattern control, computational control, and delta control are widely used in healthcare systems worldwide to detect inconsistencies in data, such as gender mismatches or significant sequential deviations (Sohrabi et al., 2022). The speed of staff in receiving the information correctly is one of the most important functions of the admission unit. Recording errors in data affects the delivery of quality of care and might have unfavorable consequences. Applying data validation techniques can help users to record information correctly.

A study was done on the traditional validation techniques and below is an explanation of traditional validation techniques: Pattern control refers to recording data in a specific format according to a predetermined structure or pattern. Format or pattern is the language used to convey the meaning of data. For example, the pattern can be character expressions, colors, letters, email addresses, phone numbers, or patient identification numbers and must follow particular patterns. Any deviation from these patterns is flagged as a potential error, thus maintaining consistency and reducing the likelihood of data entry mistakes. This method is commonly used in healthcare for ensuring uniformity in patient records and contact details (Sohrabi et al., 2022).

The study reveals that, highest mean for the necessity of applying data control techniques is for the first name, surname, and national code data items and the lowest mean for the data items related to vital signs was given by users. They got the highest rank from the components of pattern control (17.29) in the ranking of data validation techniques in terms of the importance of their application, and they go the lowest rank from delta control (2.91). In the general ranking of the effect of techniques on data quality, pattern control (5.95) and interval control (4.95), respectively, obtained the highest mean (out of 6) (Sohrabi, Garavand, Ahmadian, 2022). The conclusion was that the existing HISs had fewer benefits of using data control. However, users did not only consider it necessary to use these controls in the systems but also believe that their application will improve

their performance in recording information. Thus, for accurate documentation, HIS designers must implement these techniques in these systems, and their application should become a mandatory standard for system development.

### 2.2.3 Data quality audit and the performance of donor supported health facilities

Globally, data quality is a cornerstone of health system strengthening. Decision-making is facilitated by accurate health information, improves resource allocation, and measures the impact of interventions (WHO, 2019). Frameworks like the Health Metrics Network (HMN) advocate for consistent data quality audits (DQA) and standardized indicators for global health reporting. Studies reveal that donor-supported health systems often suffer from fragmented data sources, limiting the effectiveness of decision-making (Nielsen et al., 2012).

Data quality audits (DQAs) have become a global standard for ensuring accurate reporting in healthcare. Countries like the United States and Canada have institutionalized DQAs within their healthcare systems to maintain compliance with regulatory standards. The use of electronic health records (EHRs) has enhanced audit processes, enabling real-time cross-verification of data (Smith et al., 2021). In lower-resource countries, DQAs are often supported by international organizations. For instance, in sub-Saharan Africa, the World Health Organization (WHO) has implemented audit programs to improve data accuracy and health outcomes. These programs are credited with reducing reporting discrepancies in HIV and malaria programs by up to 30% (WHO, 2022).

Data quality audits are vital for ensuring that reported data aligns with source records. In Sierra Leone, repeated DQAs conducted during the post-Ebola recovery period led to a 25% improvement in reporting accuracy in malaria surveillance systems. These audits revealed that underreporting decreased significantly due to increased oversight and training (Mohamed Vandi, 2020). Similarly, in Malawi, DQAs helped identify inconsistencies in antiretroviral therapy data, with error rates reduced from 12% to 5.4% after targeted interventions. The audits not only improved data accuracy but also fostered a culture of accountability among healthcare workers (WHO, 2022). In Kenya, donor-supported health facilities have set benchmarks for data validation and quality audits. Facilities implementing electronic medical records (EMRs) have achieved significant reductions in errors, improving vaccination coverage and maternal health outcomes (Muthee et al., 2019). Despite these advances, disparities remain between donor-supported and government-run facilities, underscoring the need for nationwide standardization. Despite these

successes, barriers such as resource constraints and limited staff capacity hinder the full adoption of DQAs in low-resource settings (Adusei et al., 2023).

Accurate, complete and timely health information for early detection of outbreaks are needed by public health agencies. The Ministry of Health and Sanitation (MoHS) in Sierra Leone revitalized the Integrated Disease Surveillance and Response System (IDSR) towards the end of the Ebola Virus Disease (EVD) outbreak in 2015. To monitor the accuracy of IDSR data, data quality assessments were conducted. 444 healthcare facilities were evaluated in a total of four data quality assessment, 390 (87.8%) were lower-level facilities (CHC, CHP, MCHP), 47 (10.6%) were secondary and 2 (0.4%) were tertiary level hospitals. Healthcare facilities considered for this assessment increased from 79 in 2016 to 138 in 2018, recording improved representation of the data. 1729 weekly IDSR reports were reviewed during the study. That is, 299 in the first assessment, 377 in the second assessment, 501 in the third assessment and 552 in the fourth assessment (Mohamed vandi 2020). The percentage of accurate reports was almost the same across all healthcare facility categories and CHP recorded the highest (52.5%). Out of 49 reports received from healthcare facilities and clinics owned by NGOs, 19 (38.8%) were over reported. Under reporting was more found in reports from CHPs (29%) and MCHPs (28.5%) (Mohamed vandi 2020). The study exposed the importance of data quality audit and how outcomes from data quality audit helps to identify gaps in data collected. However, the study did not explore specific contribution of not-for-profit making organizatiosn/donors in the audit process. There is need to further explore the contribution of donor support in data quality audit and performance of health facilities.

A study by Martin D.M et al, 2020 revealed a general data accuracy improvement from over-reporting of 4.7% (VF of 95.3%) according to the first assessment to under-reporting of 0.2% (VF of 100.2%) in the fourth assessment. Weekly report improved greatly with accurate malaria data from 36.8% in the first assessment to 56.3% in the fourth assessment (95% CI, 12.5, 26.5%). Between the first and second assessments, a significant improvement was recorded [difference = 14.8% (95% CI 7.2, 22.3%)]. No big change was recorded between the second and third assessment [difference = 0.5% (95% CI -6.2, 7.2)] and between the third and fourth assessment [difference = 5.2% (95% CI -0.8, 11.2%)]. Out of 13 districts assessed, data accuracy increased in 6 (46.2%) in the first assessment, eight (57.1%) in the second assessment, 10 (71.4%)

in the third assessment and 9 (64.3%) in the fourth assessment. The largest discrepancies observed between recounted register data and DHIS data were 40.6% over reporting in Pujehun district in the first assessment and 25.7% underreporting in Tonkolili district in the fourth assessment. The percentage of reports with over-reporting of over 20% dropped from 20.4% in 2016 to 8.9% in 2018. Reports with underreporting of over 20% also reduced from 20.4 to 12.3% in 2018. Kailahun district Weekly reports were accurate across all assessments. More over reporting was recorded in the first assessment in 5 out of 13 districts and in the second assessments in 4 out of 14 districts compared to the fourth assessment where underreporting was recorded more 3 out of 14 districts. When producing summaries of monthly malaria cases, data compilation errors recorded were the most common cause of discrepancies between recounted data and data recorded in DHIS2. It was observed in 358 (80.6%) of all the healthcare facilities and remained the same across all assessments. Other causes for recording discrepancies were missing registers in 47 (10.6%) healthcare facilities, not submitting healthcare facility weekly reports at district level office in 25 (5.6%) and data not entered into the DHIS2 database in 24 (5.4%) healthcare facilities (Martin D. M et all, 2020). It is evident that data quality audit be done continuously to ensure consistency in producing quality data. Overtime improvement was recorded with repeated data assessment.

Improvement was the same after observing a greater improvement in data accuracy in the first assessment. This is was probably possibly due to the extensive dissemination of the DQA findings that was done by the MoHS after conducting the first assessment. Furthermore, the initial assessment was conducted during post Ebola recovery period when there was more focus on public health systems, and availability of support such as technical and financial supports for public health systems.

Data accuracy improvement observed from these assessments shows that the frequent data quality assessments contributed positively to data accuracy and is consistent with findings from reoccurring DQAs conducted elsewhere (Muthee V, et al 2019). Other factors contributing to improved data accuracy might be regular supportive supervision and shift to digital reporting introduced at the same time with the DQA. Availability of data collection tools such as registers to record patient information in standard manner may also have positive impact on data accuracy. If patient data is captured differently in different tools with different formats, then aggregation may also have error. In addition, if registers are unavailable, patient information may not be

recorded at all or may be recorded in informal registers and not transferred to the new register when they are made available

Challenges in producing quality public health data in Africa are not well documented. An undercount of 5.4% of the number of patients receiving HIV treatment in Malawi was found (WHO, 2019). Prevention of Mother to Child transmission of HIV project healthcare sites in South Africa reported more extreme deviations of 75.2% (WHO, 2019)

### 2.2.4 Joint supportive supervision and the performance of donor supported health facilities

Joint supportive supervision involves collaboration among stakeholders to monitor healthcare operations and provide guidance to staff. This approach emphasizes mentorship and continuous learning, resulting in improved data management and service delivery (WHO, 2022). For example, regular supervision visits in Ethiopia's health facilities improved data accuracy by 32% and led to better utilization of patient records for decision-making (Khatri & Brown, 2022). The Ethiopian Ministry of Health also implemented a nationwide supervision program, combining mentorship with routine evaluations. This approach enhanced service delivery, particularly in rural areas, by fostering accountability and professional growth among healthcare workers (Chowdhury et al., 2022).

Supportive supervision is recognized as a critical tool for improving healthcare workers performance. Studies show that joint supervision also positively impacts staff motivation. Countries like Nigeria and Uganda have institutionalized quarterly supervision visits to address gaps in data accuracy and service delivery. In Uganda, collaborative supervision between government agencies and development partners led to a 30% improvement in data quality and increased staff adherence to reporting protocols (Smith et al., 2021). Also, Healthcare workers in Uganda reported increased job satisfaction and a clearer understanding of their roles when supervisors provided constructive feedback and capacity-building support (Muthee et al., 2019). Joint supportive supervision initiatives improve coordination between local governments and health facilities, fostering accountability (Eboreime et al. 2019).

An open, two-way communication, and building team approaches that facilitate problem solving is enhanced during supportive supervision. It is more focused on monitoring performance towards achieving goals, and use of data for decision making, and rely on regular follow up with staff to

ensure that tasks are being implemented correctly. Most countries traditionally have used an inspection or control approach to supervision. This approach is based on the thinking that health workers are unmotivated and need strong external control to perform correctly. However, it was discovered that a supportive supervision, where supervisors and healthcare workers work together to solve problems and improve performance, delivers improved results (WHO 2020). Priority areas need to be decided, as certain ones, like the districts/health facilities, will require regular supportive supervision visits. Data and information from previous supervision visits and interventions to select priority areas for supervision must be used by Supervisors conducting the visit. Listening and documenting concerns from healthcare workers' is critical in providing required support. When discussing with healthcare workers, the purpose of the supervision must be explained, and they should be given the opportunity to share their concerns (WHO 2020).

The MOHS in Sierra Leone, supported by partners like Soltis, has implemented supportive supervision models across health facilities. Regular visits by supervisors enhance health worker performance, identify gaps in data collection, and foster a culture of accountability (Eboreime et al., 2019). Across projects, supportive supervision approaches attained several components to address individual, process-related determinants and system. From a study conducted by Madede T., et all 2017, Healthcare workers indicated that they liked been supervised, as supervision help motivates changes. However, sustaining these benefits requires consistent funding and coordination across multiple stakeholders (Smith et al., 2021). Lessons learned documented in 2022 from the African Health Initiative in Ethiopia, Mozambique and Ghana, revealed how supervision and accountability approaches had atrophied in the place of appropriate tools and skills for sharing constructive feedback between frontline workers and supervision levels. From these lessons documented, it also indicates that Supervisors pointed out inadequate funds, transport, and logistics for outreach and disclosed a tendency of supervisors to neglect performance improvement and emphasize data validation instead. The Supervisor must prepare a supervision report after every supervision visit. These reports will be used for planning future supervision visits and for corrective measures. The appropriate authorities should be well informed on the status of the health center and the findings of the visit (WHO 2020).

### 2.2.5 Staff capacity and the performance of donor supported health facilities

Several factors are linked to staff capacity with other variables that directly affect it. These variables include capacity building, availability of equipment, job satisfaction, work environment, leadership and organizational commitment. Underperformance of those providing services leads to both inaccessibility of, and inappropriate care. A study conducted by Geoffrey A., Mubarak A., Bangoora C., 2024 revealed that Most of the healthcare workers 26 (72.2%) don't have enough time to complete their daily responsibilities as well as majority 31 (86.1%) don't have a flexible schedule unlike only 5 (13.9%) do have flexible schedule. More than half 24 (66.7%) were involved in any health center management whereas only 12 (33.3%) were involved in health center management. Half 20 (55.6%) always received adequate support from their supervisors while 16 (44.4%) haven't received any support from their supervisors. The study further revealed that the majority 17(47.2%) of the participants workload is high while only 7(19.5%) workload is low. Most of the participants 30(83.3%) workload affects their performance while only 6(16.7%) doesn't affect their performance. For most of the participants 24(67.7%) the description of their work infrastructure was not convenient while only 12(33.3%) were convenient. Healthcare workers Performance does not only depend on their competence but also on their availability as well as the availability of systems in place. According to a study conducted by Sharm J. and Dhar R.L., 2016, it was revealed that burnout level is higher among healthcare workers and has an inverse relation with effective commitment. It was further observed that support from organizations plus procedural justice showed a positive relation with affective commitment in contrast to the level of burnout. Moreover, effective commitment had a string effect on the performance of staff on their job. These contributes to poor health outcomes as people are not using nor are they accessing appropriate services. There has been significant improvement in accessing maternal and child health care as well as response to HIV/AIDS in Uganda.

Capacity building enhances the skills and competencies of healthcare workers, enabling them to perform tasks efficiently and adhere to best practices in data validation and patient care. Training programs focusing on the use of electronic health systems have been particularly impactful. In a study conducted in Tanzania, healthcare workers who underwent training on digital health tools demonstrated a 40% improvement in data entry accuracy (Chowdhury et al., 2022). On-the-job training has also been effective in improving staff performance. In Kenya, a mentorship program

for health information officers resulted in improved reporting completeness and reduced data duplication errors by 20% (Kim et al., 2023). These findings highlight the importance of continuous professional development in sustaining data quality and operational efficiency. At the same time, the increasing use of data and digital health technology is transforming healthcare delivery and enhancing healthcare-workforce capabilities on a global scale. For instance, telemedicine and "internet hospitals" are providing effective access to primary and specialized care regardless of the physical distance between a doctor and patient (Tu J., Wang C., Wu S., 2015). Artificial intelligence and big data analytics support workflows and decision making for healthcare professionals, such as those for medical imaging.

Sierra Leone's reliance on donor-supported training programs has significantly improved health worker competencies. The Pay and Performance Project, initiated by the World Bank, aimed to develop leadership skills and enhance data management capabilities among health workers (World Bank, 2012). These initiatives have shown tangible benefits in improving data quality and service delivery. WHO has estimated that there will be a projected shortfall of ten million healthcare workers by 2030, which will happen mostly in low and lower middle-income nations including Uganda due to the increasing international migration of healthcare providers especially in those low and lower middle-income nations hence leading to scarcity of health workers (WHO 2022).

**Table 2.1 Summary of Review of Literature Gap(s)**

| Variable | Author(s) (Year) | Title of the study | Findings | Knowledge gap |
|---|---|---|---|---|
| Data quality audit | Ojeda-Castillo et al. (2024) | Challenges in Sustaining Health Data Audits in Developing Countries | Institutionalizing data audits within national health systems could help maintain consistent data quality over time. | More research is needed to understand how healthcare leaders use audit results to improve operational efficiency and patient care |
| | Abdel-Latif et al. (2025) | Implications for Data Quality in Healthcare Settings | Research has extensively examined how data audits improve record-keeping and compliance | More research is needed on how data quality audits directly influence hospital decision-making and clinical outcomes |
| Supportive Supervision | Kankam et al. (2024) | Addressing the Limited Workforce in Neurosurgery in Low and Middle-Income Countries | Supportive is recognized as essential strategy for improving healthcare worker performance and service quality. | Lack of research on how stakeholders coordinate their efforts to ensure effective supervision |
| | Okon et al. (2024) | Enhancing Quality Oversight in Health Training Programs Through Joint Supervision Models | Joint supportive supervision often involves multiple stakeholders, including government health agencies, NGOs, and private organizations | Further studies should explore best practices for inter-agency collaboration to strengthen healthcare supervision. |
| Staff Capacity | Nyungu & Wainaina (2024) | Strategic Management Drivers and Performance of Level Four and Five Private Hospitals in Mombasa County, Kenya | Training and capacity-building programs are vital for improving staff performance and patient care | More research is needed to establish clear correlations between staff training and measurable health indicators such as reduced mortality rates or improved treatment success rates |
| | Makau & Kiarie (2024) | Retention Strategies for Trained Healthcare Staff | Many staff leave for better-paying jobs after receiving training, leading to constant workforce shortages | Call for policies that encourage retention through incentives, career growth opportunities, and better working conditions |

# CHAPTER THREE

# RESEARCH METHODOLOGY

## 3.1 Introduction

This chapter presents the study methodology that was used. These includes the study design, the target population, sampling design, sample size, data collection instruments, validity and reliability of research instruments, data collection and data analysis methods.

## 3.2 Research Design

According to McCombes, 2021, A research design refers to an approach or strategy used in answering a specific study or research question using data. Selecting a research design means aligning with the study objectives, the type of data that will be collected and used, the sampling and data collection methodology that will be followed.

There are several research designs. However, descriptive research approach was utilized for this study. Descriptive research method is appropriate when obtaining information relating to a phenomenon under investigation and is used in explaining what exists in relation to study variables. Additionally, a descriptive study design can be relied on to provide answers to questions of where, who, how and when, that are related to the phenomenon under investigation. A secondary and primary data relevant to the study problem was collected and used. Data collection for this study was done using mixed method. That is, data collection captured both quantitative and qualitative approach to properly investigate and produce outcomes that will help in resolving prevailing issues and attract further investigations. Primary data was collected through group interviews with HCWs working in the selected health facilities. Secondary data was collected through review of existing data in registers, summary forms and District Health Information System (DHIS2). Semi structured questionnaire was administered in person in the selected health facilities. According to Voxco 2021, referred to descriptive research as the collection of quantitative and systematic data that may be utilized for statistical analysis.

## 3.3 Research Site

The study was conducted in 35 Solthis supported health facilities across 7 districts in Sierra Leone: Western Area Rural (WAR), Western Area Urban (WAU), Portloko, Bombali, Tonkolili, Bo and Kenema. Solthis is an international non-governmental health organization with priorities in emerging and infectious diseases; specifically, HIV/AIDS, tuberculosis, emerging diseases. In Sierra Leone, Solthis has implemented different projects aimed at improving HIV and tuberculosis service delivery. Solthis recently implemented New Funding Model three (NFM3) Global Fund (GF) project to achieve WHO target of 95% of all positive HIV clients knowing their status, 95% linkage to care and 95% viral load suppression. The project supported on quality service delivery through capacity building, data quality audit and Joint supportive supervision etc.

## 3.4 Target Population

The target population of the study comprised 350 HCWs (35 Facility In-charges, 35 HIV counsellors 35 Midwives and 245 Nurses) working in targeted donor supported health facilities. Respondents were able to yield appropriate and useful information for the study were selected using purposive sampling approach (Steven Campbell et al, 2020). Secondary quantitative data that was collected from the review of existing data in HIV testing and counselling (HTC) register, elimination of Monthe to Child Transmission (eMTCT) register, and health facility (HF) summary forms: HF7 and HF10 and national DHIS2 from January 2023 to September 2024 in 35 Solthis supported health facilities.

**Table 3.1 target population**

| *Category of healthcare workers* | *Population* | *Percentage* |
|---|---|---|
| Facility In-charges | 35 | 10% |
| Mid-wives | 35 | 10% |
| HIV Counsellors | 35 | 10% |
| Nurses | 245 | 70% |
| **Total** | **350** | **100%** |

### 3.5 Study Sample

This section presents the sampling procedure and population size for this study. A rationale for sampling procedure and population selection was also provided. In addition, explanation on the number of participants that are involved in the study will be provided.

#### 3.5.1 Sampling Procedure

Participants for this study were selected following purposive sampling method. According to Dr. Renu Bisht 2024, a purposive sampling approach is a non-probability approach which allows the researcher to chooses a sample (person, cases, or events) based on their assessment that it would fit the study purpose. Thirty-five (35) HFs supported by Solthis were selected because, more interventions on improving quality of HIV data collected and reported and quality service delivery was done in those facilities under the NFM3 project as compared to the others. Also, these facilities can be easily accessed during routine work operations as the study is resource constrained. Primary data was collected from healthcare workers who were involved in HIV service delivery under the NFM3 project implemented by Solthis. These healthcare workers were able to provide acuate and reliable information to inform study outcome since they were actively involved in the project implementation.

#### 3.5.2 Study Sample Size

Primary data was collected from 70 healthcare workers (35 HIV counsellors and 35 Midwives) working on HIV Testing and counselling (HTC) and elimination of Mother to child transmission (eMTCT) services from the 35 selected donor supported health facilities were interviewed to assess the performance of their health facilities. The selection was done using purposive sampling because, Specific participants benefitted directly from the project and are very familiar with the intervention and support provided by Solthis and they can provide information relevant to the study objective. Taking into consideration the study aims and objectives, specific category of healthcare workers holds different and significant opinion about the topic and issues that were asked. Therefore, there is need to include them in the sample (Campbell S. et al 2020). They 35 facility In-charges and 245 Nurses are not purposively represented because, they are involved in more generally health service delivery with less intervention in HIV service delivery as compared to the 70 HCWs who are specifically assigned to deliver HIV care which is the focus area for Solthis.

Secondary data was collected from the review of HIV registers (HTC and eMTCT registers) and summary form (HF summary form 7 and 10) from January 2023 to September 2024 to assess data quality and performance selected health facilities.

**Table 3.2 Sample size**

| *Category of healthcare workers* | *Population* | *Percentage* |
|---|---|---|
| Mid-wives | 35 | 50% |
| HIV Counsellors | 35 | 50% |
| **Total** | **70** | **100%** |

## 3.6 Data Collection

This section presents an overview of pilot testing of instrument reliability and validity and validity, data collection procedure, data processing, analysis and legal and ethical considerations that was followed.

### 3.6.1 Data Collection Instruments (and/or Data Collection Materials)

A semi structured questionnaire was used to collect primary data following focus group discussion. Interviews conducted using questionnaire might directly and swiftly obtain information on the behaviors, attitude, traits, and views of participants used for the study, all of which can be utilized as first-hand data for empirical research (Lu et all, 2021). Recommended ethical standards including confidentiality of participants were adhered to for this study.

### 3.6.2 Pilot testing

Before starting actual data collection, questionnaire was piloted. This helped to refine the instrument and improve accuracy of the questionnaire to capture relevant and necessary data for the study. The pilot study was done in Waterloo Community Health Center (CHC), a none targeted facility to test the accuracy of the available tools for the study. Waterloo CHC was selected for pilot testing because, it offers all HIV services offered in targeted donor supported health facilities for this study and it is also supported by another donor partner. This health facility also uses the same national guidelines and other tools used by Solthis to improve HIV service delivery

### 3.6.3 Instrument Reliability

The pilot study that was carried out helped to ascertain the reliability of the questionnaire. This piloting was done in Waterloo CHC, a none targeted site but with similar attributes to actual data collection sites was considered in testing the reliability of the variables before embarking on actual data collection. The questionnaire for the study was piloted for reliability following a focus group discussion method. A minimum of four healthcare workers were interviewed to maintain focus group discussion best practice for a focus group discussion which will help to further refine the tools to improve reliability of the questions to capture relevant data for the study if necessary.

### 3.6.4 Instrument Validity

Questionnaire and health facility performance scorecard tools that was used for this study has been used to collect, analyze and validate data in other studies. The Performance scorecard provides opportunity to combine a range of data to give a comprehensive representation of healthcare system performance, revealing strengths, weaknesses and improvement areas (Robin Gauld et al, 2011). All items were reviewed and verified for Validity, clarity and comprehensiveness and agreement was reached on items that would be included or removed in the finalized instrument to ensure it measure what is intended to be measured.

### 3.6.5 Data Collection Procedures

Upon receiving study proposal approval from the Monitoring and Evaluation department of Africa Nazarene University to collect data, the researcher was able to seek approval from the National Aids Control Program (NACP) to collect data from Solthis supported facilities. Since NACP is the body responsible for providing approval before collecting HIV data for any study in health facilities. After receiving necessary approvals and permissions, data collection started after informing the facilities in-charges. The research was supported by Solthis staff already assigned to the targeted facilities. These support staff were trained to clearly understand the study purpose, instruments that will be used and study ethics. The researcher and support staff administered the questionnaire to the respondents in person and in targeted HFs.

## 3.7 Data Processing and Analysis

Following secondary data collection from the review of registers and summary forms, Questionnaire was administered using focus group discussion to collect primary data. After data collection for the study, data was reviewed to ensure quality data is analyzed using health facility performance scorecard for secondary data, which provides opportunity to combine a range of data to give a comprehensive representation of healthcare system performance, revealing strengths, weaknesses and improvement areas and Atlas ti 23 for qualitative data which has AI efficiency to provide fast and accurate insight and have them coded based on your intentions. Descriptive analysis such as frequencies, percentages, averages using table and charts was followed to summarize the characteristics of the sample, outcome and predictive variable.

## 3.8 Legal and Ethical Considerations

Before starting data collection, all required approval from Africa Nazarene University, NACP and health facility in-charges were followed. Invitation was sent to participants and sample of the questionnaire was shared for review and approval. Upon receiving approval, data collection was done through focus group discussion. Appropriate research processes and procedures were followed throughout the study. All necessary Applications that require approvals were developed and submitted for approval. Consent forms was developed and issued to respondent before the start of every interview and questionnaires were only administered after receiving approved consent from respondents.

# CHAPETER FOUR

# FINDINGS AND DATA ANALYSIS

## 4.1 Introduction

This study aims at assess how data quality validation approaches influence the performance of Solthis supported health facilities in Sierra Leone. Primary data for this study was collected through Focus Group Discussion (FGD) using semi structured questionnaire and secondary data from the review of data in HIV testing and counseling (HTS) and elimination of mother to child transmission (eMTCT) registers, summary forms and district health information system DHIS from 35 Solthis supported health facilities. Analysis is presented in this chapter and findings interpreted and discussed.

## 4.2 Rate of Response

### 4.2.1 Response rate – FGD

A total of 70 healthcare workers (35 Mid wives and 35 HIV counsellors) were purposively sampled to participate in the focus group discussion. However, only 61 (87%) of the sampled healthcare Workers (29 Mid-wives and 32 HIV counsellors) participated in the discussion. 4 were either transferred to other HFs in the same level/role or promoted to a higher role in a secondary HF or at national level. 5 were not available at all to join the discussion due to personal reasons.

### 4.2.2 Gender Representation of FGD Respondents

Table 4.3 indicates that, among 61 healthcare workers that participated in the focus group discussion, 46 (75%) were female while 15 (25%) were male. Gender sensitivity was not achieved. However, there was fair representation of healthcare worker from across all targeted health facilities.

**Table 4.1 Gender of respondents**

| *Gender of Respondents* | *Frequency* | *%* | *Cumulative %* |
|---|---|---|---|
| Female | 46 | 75% | 75% |
| Male | 15 | 25% | 100% |
| **Total** | **61** | **100%** | |

**Source: 2025 research**

### 4.2.3 Designation of Respondent

Table 4.4 indicates that, among the 61 focus group respondents, 29 (48%) were Mid-wives while 32 (52%) were HIV counsellors. This is an indication that data was collected from key healthcare workers who benefited from Solthis intervention and that findings from the study are from actually beneficiaries from across the 35 Solthis supported health facilities in Sierra Leone.

**Table 4.2 Designation of respondent**

| *Designation of Respondent* | *Frequency* | *%* |
|---|---|---|
| Mid-wives | 29 | 48% |
| HIV Counsellors | 32 | 52% |
| **Total** | **61** | **100%** |

**Source: 2025 research**

### 4.2.4 Records reviewed

For secondary data, a total of 2,139 records were reviewed in the HTC register, eMTCT register, summary reporting forms and DHIS2 from January 2023 to September 2024. A total of 9 reports, representing 3 reports per month per health facility were targeted for review for this research. However, three 3 quarters could not match the 315 targets because, some health facilities were not able to provide reports for some months which affected the number of reports reviewed in some quarters. These data points captured health information system components, service delivery, retention in care, etc.

**Table 4.3 Records reviewed**

| *Record period* | *Number of records reviewed* | *% records reviewed* |
|---|---|---|
| Q1 2023 | 315 | 15% |
| Q2 2023 | 315 | 15% |
| Q3 2023 | 297 | 14% |
| Q4 2023 | 312 | 15% |
| Q1 2024 | 270 | 13% |
| Q2 2024 | 315 | 15% |
| Q3 2024 | 315 | 15% |
| **Total** | **2139** | **100%** |

***Source: Research 2025***

## 4.3 Presentation of research Analysis, Findings and Interpretation

### 4.3.1 Influence of Data quality audit on the performance of Solthis supported health facilities in Sierra Leone

Data quality audit is measured using the following indicator: accuracy of data collected, completeness of data collected, consistency of data collected and timeliness of data collected. Records were revived and compared across sources: HIV testing service register, elimination of Mother to child transmission register, summary reporting forms and DHIS2 to ascertain the dimensions of data quality. That is, accuracy, completeness, consistency and timelines of records.

**Table 4.4 Outcome of Data quality audit conducted in 35 Solthis supported health facilities in Sierra Leone**

| *Statements* | *Q1 2023 %* | *Q2 2023 %* | *Q3 2023 %* | *Q4 2023 %* | *Q1 2024 %* | *Q2 2024 %* | *Q3 2024 %* | *Overall average %* |
|---|---|---|---|---|---|---|---|---|
| 1. Report assessed with accuracy | 226 (70%) | 240 (76%) | 253 (85%) | 303 (97%) | 0 (0%) | 275 (87%) | 297 (94%) | **85%** |
| 2. Report assessed with completeness | 306 (97%) | 306 (97%) | 297 (100%) | 312 (100%) | 0 (0%) | 315 (100%) | 315 (100%) | **99%** |
| 3. Report assessed with consistency | 279 (89%) | 297 (94%) | 279 (94%) | 312 (100%) | 0(0%) | 315 (100%) | 315 (100%) | **96%** |
| 4. Reports submit on time | 236 (75%) | 242 (77%) | 255 (86%) | 309 (99%) | 0 (0%) | 156 (50%) | 312 (99%) | **81%** |

**Source: HTS and eMTCT registers, HF7, 9 & 10 summary reporting forms& DHIS2**

Statement (1) report assess for accuracy of data shows good performance from 226 (70%) in Q1 2023 to 297 (94%) in Q3 2024. Great improvement was achieved comparing Q1 2023 226 (70%) to Q4 2023 303 (97%), which is best performance seen across all quarters. The trend in data accuracy shows consistent improvement until Q4 2024, when performance dropped from 303 (97%) in Q4 2023 to 0 (0%) in Q1 2024. However, improvement was seen again from 275 (87%) in Q2 2024 to 297 (94%) in Q3 2024. An overall average performance of 85% was recorded for data accuracy, indicating that regular data quality audits contributed in improving accuracy of data, which positively influence the performance of the health facilities

Statement (2) report assessed for completeness of data reported shows good performance from 279 (97%) in Q1 2023 to 315 (100%) in Q3 2024. 100% score was recorded in 4 quarters (Q3&4 2023 and Q2&3 2024). The trend shown was stable until Q1 2024 when performance dropped from 312 (100%) to 0 (0%) score. However, performance was stable again at 315 (100%) in Q2 and Q3

2024, recording an overall average score of 99%. The result shown here indicates that data quality audits conducted by Solthis contributed in improving the completeness of data, which positively influence performance of health facilities.

Statement (3) report assess for consistency of data shows good improvement from 279 (89%) in Q1 2023 to 315 (100%) in Q3 2024. The trend in data consistency was stable across quarters until Q1 2024 when performance dropped from 312 (100%) in Q4 2023 to 0 (0%) in Q1 2024. However, improvement was seen again from 0 (0%) in Q1 2024 to 315 (100%) in Q2 and Q3 2024 with an overall average score of 96%. The result to the study indicates that regular data quality audits contributed in improving consistency of data, which positively influence the performance of the health facilities

Statement (4) report assessed for timeliness of data reported also shows good performance from 236 (75%) in Q1 2023 to 312 (99%) in Q3 2024. The trend shown was stable until Q1 2024 when performance dropped again from 309 (99%) in Q4 2023 to 0 (0%) score. However, performance improvement was seen again from 0% in Q1 2024 to 156 (50%) and 312 (99%) in Q2 2024 and Q3 2024 respectively. Data reported on time recorded an overall average score of 81% indicating that data quality audits conducted by Solthis contributed in improving the timeliness of data reported, which positively influence performance of health facilities.

Across all statements (1 to 4), the drop Q1 2024 was as result of transition to revised reporting tools implemented at national level that led Q1 2024 results to a 0% score. Statement from report reviewed indicates that “The national Aids Control Program (NACP) in collaboration with it partners reviewed the national HIV tools (Registers, summary forms, DHIS2) in 2023 with the aim of rolling them out in January 2024. But there was delay in completing the printings and distributing the revised tools to be used by health care workers at health facility level to migrate data from the old tools to the revised tools including DHIS2. The delay went up to May 2024 which have prevented health care workers from generating retrospective and current data and reports using the revised tools. This has also prevented further reporting into DHIS2 for 2024”.

### 4.3.2 Influence of joint supportive supervision on the performance of Solthis Supported health facilities

Joint supportive supervision visits were conducted by Solthis and its partners as a validation approach to assess the status of health facilities in terms of documentation, availability of tools and guidelines, data collection processes, analysis and use and services delivery. A checklist is used by the visiting team to assess and document findings. Performance is measured using the below statement to assess the performance of the 35 Solthis supported health facilities during the Joint Supportive supervision visit conducted by Solthis and its partners

**Table 4.5 Outcome of joint supportive supervision conducted in 35 Solthis Supported health facilities in Sierra Leone**

| *Statement* | *expected Number HFs* | *Actual number HFs* | *% achieved* |
|---|---|---|---|
| 1. HFs with dedicated staff that supports HIV activities including data management | 35 | 35 | 100% |
| 2. HFS with all relevant staff who have received appropriate training on the data management processes and tools. | 35 | 35 | 100% |
| 3. HFs with designated staff responsible for reviewing periodic reports prior to submission to the next level (e.g. sub-district, district or national levels). | 35 | 33 | 94% |
| 4. HFs with copy of clear instructions on how to complete the data collection and reporting forms/tools provided by the National Program/Project. | 35 | 35 | 100% |
| 5. HFs with relevant personal data maintained according to national or international confidentiality guidelines. | 35 | 32 | 91% |

| | | | |
|---|---|---|---|
| 6. HFs that develops charts, graphs, maps, etc. (If yes, ask to see them.) | 35 | 34 | 97% |
| 7. HF with staff that have access to guidance / technical assistance on data use (e.g. peer review meetings, or during supervisory visits). | 35 | 35 | 100% |
| 8. HFs that disseminate data that include indications of any limitations that may exist in the data. (If yes, ask to see examples.) | 35 | 34 | 97% |
| 9. HF that take programmatic decisions based on analyzed data / results. (If yes, ask for examples.) | 35 | 35 | 100% |
| **Overall average** | **35** | **34** | **97%** |

**Joint Supervision data**

Statement (1) health facilities with dedicated staff that supports HIV activities including data management shows that 100% of all Solthis supported health facilities have a dedicated staff for their focus intervention area which is HIV and for data management. This will influence quality service delivery, documentation and performance of health facilities.

Statement (2) health facilities with all relevant staff who have received appropriate training on the data management processes and tools show 100%, indicating that Solthis supported health facilities have staff who have been trained on data management processes and tools. This might have contributed to quality documentation exhibited in data quality performance section which influence performance of health facilities

Statement (3) health facilities with designated staff responsible for reviewing periodic reports prior to submission to the next level (e.g. sub-district, district or national levels) show good performance as 94% of all Solthis supported maintains a staff responsible for reviewing periodic report before submitting to the next lev. Only 2 health facilities do not have designated staff to review report. This approach will enhance quality reporting that will contribute to the performance of the health facilities

Statement (4) health facilities with copy of clear instructions on how to complete the data collection and reporting forms/tools provided by the National Program/Project indicates that 100% of all Solthis supported health facilities have copy of clear instruction guiding the facility staff in completing data collection and reporting tools. This to this research indicates that this instruction promote quality reporting which also influence the performance of Solthis supported health facilities

Statement (5) health facilities with relevant personal data maintained according to national or international confidentiality guidelines shows that 91% of Solthis supported health facilities maintain confidentiality of client's data. This increases the confidence of patients to regularly access care and trust between the patients and the health care workers, which promotes the performance of health facilities. Only 3 health facilities could not meet the requirement due to insufficient storage space to archive patient records

Statement (6) health facilities that develops charts, graphs, maps, etc. (If yes, ask to see them.) shows 97% performance indicating 34 out of 35 health facilities conduct analysis of their data to support decision making that will promote the performance of the health facility. This performance for this research also indicates that, most of the decision taken by the health facility staff is influenced by data.

Statement (7) health facilities with staff that have access to guidance / technical assistance on data use (e.g. peer review meetings, or during supervisory visits) records 100% performance indicating that staff across all Solthis supported health facilities have received technical support on data use. This approach will promote quality making that will influence the performance of health facilities

Statement (8) health facilities that disseminate data that include indications of any limitations that may exist in the data (If yes, ask to see examples.) recorded 97% performance. This approach shows that health facilities document their mistake, promote lesson learning and encourage recommendations that will boost the performance of health facilities.

Statement (9) health facilities that take programmatic decisions based on analysed data / results. (If yes, ask for examples.) record a 100% performance. This approach promotes evidence-based decision making as health facilities supported by Solthis heavily rely data generated from their

health facilities make inform and reliable decision that will influence the performance the health facility

Overall, on average of 34(97%) of 35 Solthis supported health facilities recorded good performance on statements 1 to 9 indicating positive influence on the performance on those facilities.

### 4.3.3 Influence of staff capacity on the performance of Solthis Supported health facilities

Staff capacity and performance was measured by reviewing the performance HIV indicators linked to 95, 95, 95 target set by WHO. Which means, 95% of people test positive for HIV should know their status, 95% of newly positive HIV clients should be linked to care and 95% of HIV clients receiving treatment should have their viral load suppressed. Reaching these targets indicates that health care Workers in Solthis supported health facilities have the capacity of providing quality HIV service to their clients.

**Figure 4.6 Outcome of assessment conducted on indicators linked to the 95, 95, 95 WHO targets in 35 Solthis health facilities Sierra Leone**

| *Statements* | *Q1 2023 %* | *Q2 2023 %* | *Q3 2023 %* | *Q4 2023 %* | *Q1 2024 %* | *Q2 2024 %* | *Q3 2024 %* | *Overall average %* |
|---|---|---|---|---|---|---|---|---|
| 1.Expose infant initiated on NVP within 72 hrs | 94% | 97% | 100% | 100% | 100% | 100% | 100% | **99%** |
| 2. Pregnant women tested positive for HIV at first ANC and timely initiated ART | 95% | 95% | 91% | 99% | 95% | 96% | 98% | **96%** |
| 3. Adults tested positive and timely initiated ARV treatment | 93% | 97% | 88% | 89% | 90% | 95% | 98% | **93%** |
| 4. HIV clients interrupted in treatment (IIT) | | | | 2.4% | 3.5% | 3.8% | 3.3% | **3%** |
| 5. Clients with suppressed VL (VL<1000 c/ml) among VL result received | 98% | 99% | 92% | 100% | 89% | NA | NA | **95%** |

**Source: HTS and eMTCT registers, HF7, 9 & 10 & DHIS2- January 2023 to September 2024**

Statement (1) Expose infant initiated on Nevirapine (NVP) within 72 hours results are excellent and stable across quarters, with 100% recorded from Q3 2023 to Q3 2024. Exposed infants initiated on Nevirapine within 72 hours recorded an overall average of 99% indicating in the study that staff in Solthis supported health facilities have the capacity to prevent mother to child transmission of HIV by ensuring infants born from HIV positive mothers receives NVP within 72 hours after birth to prevent HIV transmission to the newborn, which positively influence the performance of the health facilities.

Statement (2) Pregnant women tested positive for HIV at first ANC and timely initiated ART shows very good results from 95% in Q1 2023 to 98% in Q3 2024. Result was pretty stable (>90%) across all quarters. However, 99% was recorded in Q4 2023, which is the highest across all quarters. An overall average of 96% was recorded for positive HIV pregnant women timely initiated on treatment, indicating in this study that staff in Solthis supported health facilities have the capacity of linking newly positive HIV pregnant women on HIV treatment to prevent the unborn child from contracting the disease and to keep the pregnant woman healthy. This also contributes positively to the performance of the health facilities.

Statement (3) Adults tested positive and timely initiated ARV treatment results are globally good from 93% Q1 2023 to 98% in Q3 2024. However, a drop was recorded from 97% in Q2 2023 to 88% in Q3 2023 due to stockout in HIV medication and denial from some of the positive clients. Result started improving consistently across quarters from 88% in Q4 2023 to 89%, 90%, 95% and 98% in Q4 2023, Q1, 2 & 3 2024 respectively. An overall average performance of 93% was recorded for positive HIV Adult timely initiated on treatment indicating in this study that Staff in Solthis supported health facility have the capacity to link newly positive HIV adults to care which contributes positively to health facility performance.

Statement (4) HIV clients interrupting in treatment (IIT) shows recorded good performance. As of Q3 2024, out of a total of 6,299 clients receiving HIV treatment (ART), only (208) 3.3% were recorded interrupted in treatment. An average of 3% on average was recorded for HIV clients on treatment who interrupted in treatment indicating that 97% of all clients on treatment were retained in care, which is above the 95% WHO target This also shows that staff in Solthis health facilities have the capacity to retain in care huge proportion of HIV clients receiving treatment. Result from Q1 2023 to Q2 2023 was not included because of double counting issues. Data collection issues

led to biased results overestimating percentage of Interrupted in Treatment (IIT) from Q1 to Q3 2023 period (IIT cases were sometimes counted twice or three times per clients). Considering this, we have decided not to interpret the results. However, data collection was reliable starting from Q4 2023

Statement (5) Clients with suppressed Viral Load (VL>1000 c/ml) among VL result received shows good results. Result is pretty stable at above 90% from Q1 2023 to Q4 2023. Q4 recorded 100% which is the highest across all quarters. A drop was recorded in Q3 2023 (99% in Q2 to 92% in Q3 2023 and in Q1 2024 (100% in Q4 2023 to 89% in Q1 2024). Overall, clients with suppressed viral load recorded an average performance of 95% across all quarters achieving WHO target of 95% of HIV clients receiving treatment should have their viral load suppressed, indicating that staff in Solthis supported health facilities have the capacity to provide quality HIV service by ensuring medication uptake for HIV clients resulting to suppressed VL which positively influence the performance of health facilities.

### 4.4 Presentation of qualitative Analysis, Findings and Interpretation

#### 4.4.1 Influence of Data quality audit on the performance of Solthis supported health facilities in Sierra Leone

Following responses from the focus group discussion, data quality audit is considered a huge contributing the factor to the quality documentation across health facilities. Perceptions from HCWs are also very positive mentioning the added value of data quality audit and covering different areas of data monitoring.

*"data quality audits conducted by Solthis contributed not in improving the quality of report generated, but also building our capacity to work on our reports independently. With this support, we can now boost of quality data in our facilities*

*"During our data quality audits, we are able to ensure that looking at the data elements in the reporting and then also in the register. So, we triangulate to ensure that what is being reported is what is right in the register".*

*"Before now, we use to have lots of mistakes in our reports but through the data quality audits conducted by Solthis, our mistakes have reduced drastically. Solthis staff will come and check the registers, if there are any mistakes, they will help us to correct the data and provide mentorship at the same time. We now understand the registers very well"*

### 4.4.2 Influence of joint supportive supervision on the performance of Solthis Supported health facilities

From response received from the focus group discussion, joint supportive supervision was described as key approach to improving performance of health facilities as it covers not only data monitoring but also quality of care. Respondent also described the rationales, relevance, processes and impact of joint supportive supervision. Perceptions from HCWs are very positive mentioning the added value of joint supportive supervision.

The rationales of joint supportive was described by healthcare workers as "an activity that includes capacity building to address potential gaps and needs not only in data management but also in quality service delivery."

The relevance of joint supportive supervision is considered important by most interviewed healthcare workers.

*"I consider Joint supportive supervision to be the most important because they tell you what you did right, what you think you did right and what you need to improve on. For me the joint supportive supervision is the most appropriate one (Bombali). "They are all important. like the joint supportive supervision. When they do the on-sport check, something that you missed they will do the correction with you. And that correction sticks to your brain. Anytime you are doing it you will recall and be able to do your work properly'*

*"it allows to monitor HF performance (through data analysis) and practices (through observation) and offer the opportunity to take decision and support HCWs to improve their practices. "*

The process of joint supportive was described by healthcare workers as an activity focusing on data and reporting quality check completed with mentorship and practical support to address gaps and challenges. It was also mentioned that this activity was taking care to invite all health workers in the facility in the process to improve overall practices.

*"The joint supportive supervision was not really policing. It was really, really a learning moment for all staffs they meet and they do not only focus on HIV focal, but every staff they met in the facility. They ensure you sit together one to one, you discuss. They will not cast blames. They will say, where do you think we need more improvements? Where do we need to improve on? Where have we done well? So, they will start with praises and all others, then started to correct some issues in a very polite form.*

*'The joint supportive supervision is where they include the DHM team with other partners at times. They go to our facilities try to engage us on all activities pertaining to HIV activities They will go through our register one by one and they do correction instantly. They will help us to understand where we don't have understanding…. Like for mother and neonate, they trained us, from there we come to the reporting tools and they trained me how to use the reporting tools on that supportive supervision. So now I know how to use it, I am thank for that*.

*"Solthis are doing very well, they have been supportive. Most times they want to do this activity they collaborate with the DHMT and even the last time they involved the DHS and they holistically look at all the activities like HIV and more collectively the TB. As you cannot talk about HIV without paying attention on TB. They took out all these factors they were here they looked at our registers, asked questions and where there is lapses or gap they provide the answers and make sure everyone is at the same level in term of knowledge"*

Impact of joint supportive were considered by some respondents as game changer for the them as they can now do lots of things they could not do before.

*"I did not benefit from the initial training that was conducted on the use of the tools and I was not comfortable in using the tools before, but through this joint supportive supervision visits conducted by Solthis, DHMT and NACP, I can now fill the registers without making mistake"*

### 4.4.3 Influence of staff capacity on the performance of Solthis Supported health facilities

Capacity building was considered as huge contributing factor the above performance. Generally, almost all the participants have the same definition of capacity building including the idea of gaining knowledge with the help of trainings and a majority of participants included the idea that this knowledge shall be effectively used for service delivery and for the benefit of the recipient of Care (RoC):

*"It is to improve our knowledge so that we can help ourselves to do exactly the proper work towards the HIV/AIDs work we are doing now to help our clients so that we can improve their health"*

From all the FGD, capacity building activities provided by Solthis were covering various thematic on technical aspects (from prevention to care), relation with RoCs (stigma, counseling, support), integration of HIV services, PSM, lab and M&E. There was statement by many HCWs that activities were aiming to increase their knowledge, attitude and practices.

*"In the first place Solthis have been very hard working at our facility. Before Solthis came, we had no better knowledge about HIV management and care at our facilities. But through their mentorship, training and coaching, we can be boastful of our work; such as timely data reporting, collection of data, getting patients information right".*

Mix of strategies and activities were mentioned to build their capacities as a process implemented along the time, linking the benefit of the different activities implemented physically or at distance to support their practices.

*"For the past years, I think Solthis have been organizing trainings for staff. They have been supporting us on the sites and supportive supervision in which they teach you on things that they see that you are not doing well or you have some knowledge gap. They take you through and they have been providing us with job aids with things in reference in case you are in doubt of anything. And also, they have been providing their contact numbers. In case you are in doubt, you can call any one of them"*

*"They do onsite training, class room training, and general training. They also do mentoring". Anytime we call them, they answer to our call, they help us during our difficulties in some cases like how to support patients to take their medication*

More specifically, responses from participants provide key information on the objectives, methodology and added value of the different capacity building activities:

*"They did the facilitation and the coordinator for Solthis was with them. They also had other participants from ministry of health, NAS, and the like. They conducted the training for five days where we sat in groups. The tools were given to us and we were mentored on how to fill or use these new tools… There was a space for us to recap, something like a role play. For them to know if we understand what they taught us''.*

*"The classroom training has been something like a discussion class. Most of the time, when you go for a training, they will give you a pre-test. So, for them to know your knowledge, the topic they are going to teach you. After also, they are going to give you post-test. So, they will also assess what you have learned after the training. And most of the time, the training will be interactive."*

*"One thing I know about Solthis, even if you go for classroom training, they will still do a follow at the center with mentoring. They will check where you are lack, where you are not doing well and step in trying to indicate you for you to understand well''*

Frequency of activities vary depending on the type of capacity building and the needs assessed in each health facility. According to HCWs, classroom trainings gathering many HFs were often every quarter, onsite training could be on a monthly basis as for supportive supervision, while mentorship/coaching could be weekly. Overall, HCWs were mentioning that capacity building was an on-going process adapted to the needs and involving all the staff at health facility level.

*"For a week, they can go to our facility twice. With the help of Solthis, they address issues immediately which they are able to handle. Those that they cannot able, they do follow up to the DHMT and to the store so that we are not short of drugs, test kits, and all those others"*

*"Solthis stepping in faster to know what was the problem and try to tackle that problem. So this capacity building was an ongoing process because they will go there monthly, weekly and even on daily basis"*

The positive impact of capacity building for improved quality services was recognized by all the HCWs both at individual level and at facility level.

*"As I am talking in my facility, all positive HIV patients are now on treatment and again we see the adherence to treatment is improving, we are having a very good result especially when we are sending our viral loads when the result comes, for me I sent up to ten to fifteen patient viral load all had viral load suppressed".*

*"But with Solthis over the years, I think I can say they have done a lot. Because my facility is now providing viral load services, CD4 cell counts, and new tools have been provided on the sites and trainings. I think now you can talk about quality service providing for my patients"*

*"Before the intervention of Solthis it was a mess In terms of patient care, Data collection, even with our building. Before now at the end of the month maybe we don't fill our report on till the 15th of the other month. Because we are on our own, we lost a lot of patients. When you come, we give you your medicine When you don't come, we are not around We leave you. But with the intervention of Solthis, more teachings, more trainings, We improved… Now, we don't have a lot*

*of defaulters and for now we are proud that the second of every month, second to the fifth our reports are ready"*

*"Before this time, we have so many children or infant who are positive but this time with the help of Solthis, we understand to take care of our client from ANC to labor and delivery to breast feeding. 99 percent of these children are now negative, it is very hard to see positive children now. The capacity building has made us become very happy, because some us we have sisters, brothers, wife everything. If my brother is positive his wife positive, they now give birth to child negative, this is very good"*

*"Before this time, you can go through our registry, it is like a mess but with all this training and mentorship it has improved the quality of data in all PHU. Also, the quality of care is when the patient needs service, he or she get that service. Before it was one person and if you come around and the person is not around you will not get the service. But now with the intervention of Solthis and this mentorship, everyone in the facility is able to render that service and that has improved the quality of medical care"*

*"With the capacity building over the years with Solthis, it has helped me to provide quality care for patients. Because before now, I was just prescribing drugs. I was not doing viral loads because the capacity was not there. I have not been doing CD4 cell count for my patients. Even the reporting tools, I was not too familiar with them".*

*"I can talk to a patient with confidence now. Now I know how to talk to clients. I know when to admit a client at our own HIV unit …and they have taught us on how to report. The accuracy of the report"*

# CHAPTER FIVE

# DISCUSSIONS, CONCLUSIONS, AND RECOMMENDATIONS

## 5.1. Introduction

This chapter presents summary of findings from data analysis. The chapter also covers other components such as the conclusion from findings, recommendations and possible areas for future studies.

## 5.2 Summary of Findings

The findings are summarized in this section based on the research objectives

### 5.2.1. Influence of Data quality audit on the performance of Solthis supported health facilities in Sierra Leone

Findings from the data analysis shows that data quality audit is an important component of data quality validation. Analysis indicates good performance in the quality of data generated and reporting in Solthis supported health facilities. Analysis indicates a minimum overall average data quality performance score of 81% for timely reporting and a maximum overall average performance score of 99% was recorded for completeness of data reported, followed by 96% on average performance score for data consistency and 85% on average performance score for Accuracy of data. Trend shown in the analysis indicates that regular data audit influenced the accuracy, completeness, consistency and timeliness of data reported, which also influence the performance health facilities producing those reports. Response from the focus group interviews also considered data quality audit as a huge contributing factor to the quality of documentation across health facilities. The perceptions of health care Workers were positive mentioning the added value of data quality audit covering different areas of data monitoring. These findings align with previous empirical study by Muthee V, et al 2019, which discovered that improvement observed from the data quality assessment shows that the frequent data quality audit contributes to data accuracy which was consistent with findings from reoccurring data quality audits conducted and positively influence the performance of donor supported health facilities. A study conducted on data quality information and decision making in New Zealand indicates that, the increase in information intensive nature of business requires a proactive and strategic approach to data quality

to ensure that the correct information is available in the correct format, at the right time and to the right person

### 5.2.2. Influence of joint supportive supervision on the performance of Solthis Supported health facilities in Sierra Leone

Generally, the analysis from the joint supportive supervision supported by Solthis shows that all (100%) of Solthis supported health facilities have dedicated health care Workers supporting HIV activities, all of those healthcare workers have benefited from capacity building interventions including data management with copy of available instructions/guidelines and tools to support quality data collection, reporting and use processes. It was also indicated in the analysis that all (100%) of Solthis supported health facilities rely on data generated in health facility to take programmatic decision. This will enhance quality decision making that will influence the performance of those health facilities. Overall, an average performance score of 34(97%) of all Solthis supported health facilities achieved all statements on the supervision checklist. From responses gathered during the focus group interviews, joint supportive supervision was described as a key approach to improving performance of health facilities as it covers not only data monitoring but also quality of service delivery. The rationale for joint supportive supervision was described by health care Workers as an activity that include capacity building to address potential gaps and needs, not only in data management but also in quality service delivery. This aligns with study conducted by WHO, 2022 which indicate that the approach of joint supportive supervision emphasizes mentorship and continuous learning, resulting in improved data management and service delivery. Khatri & Brown 2022, also indicated that regular joint supportive supervision visits in Ethiopia improved data accuracy by 32% and led better utilization of patient records for decision making.

### 5.2.3. Influence of staff capacity on the performance of Solthis Supported health facilities in Sierra Leone

From analysis, performance in case identification, linkage and retention in care of HIV clients indicates that Solthis staff have the capacity to provide quality services to their clients which greatly contributes to health facility performance. Results from the analysis shows that, Expose infants initiated on Nevirapine recorded an average performance score of 99% across all quarters, HIV positive pregnant women timely initiated on treatment recorded an average performance of

96% , HIV positive adults timely initiated on treatment recorded an average performance score of 93%, HIV clients interrupted in treatment also shows good performance with an average performance score of 3% of clients interrupted and performance on virally suppressed clients recorded an overall average performance score of 95% across all quarters. The result from the analysis indicates that staff in Solthis supported health facilities have the capacity of providing quality service to their patients which influence the performance of health facilities. Responses from the focus group discussion also indicates that capacity building was considered a huge contributing factor to the above performance. Almost all Participants indicates that capacity building activities provided by Solthis were covering various thematic on technical aspects (from prevention to care), relation with RoCs (stigma, counseling, support), integration of HIV services and M&E. This aligns with a conducted by Sharm J. and Dhar R.L., 2016, which revealed significant improvement in accessing maternal and child health care as well as response to HIV/AIDS in Uganda. In another study conducted in Tanzania, healthcare workers who underwent training on digital health tools demonstrated a 40% improvement in data entry accuracy (Chowdhury et al., 2022).

### 5.3. Conclusion from the Findings

The first objective is to examine how data quality audit influences the performance of Solthis supported health facilities in Sierra Leone. Findings generated from both quantitative and qualitative data indicates that data quality audit positively influence the performance of Solthis supportive health facilities in Sierra.

The second objective of the study is to explore how joint supportive supervision influence the performance of Solthis supported health facilities in Sierra Leone. The findings generated from joint supportive supervision visits and qualitative interviews concludes that joint supportive supervision visits positively influenced the performance of Solthis supported health facilities in Sierra Leone.

The third object of the study which is to understand how staff capacity and performance influence quality service delivery in Solthis supported facilities in Sierra Leone. The findings generated from data review and focus group interviews indicates that staff capacity and performance have a positive influence on quality service delivery in Solthis supported health facilities in Sierra Leone

Overall findings from the quantitative and qualitative data analysis demonstrate that data quality validation approaches implemented by Solthis in the past years did have a significant positive impact on data quality improvement, quality service delivery, healthcare Worker's capacity and on the performance of health facilities.

Indeed, all the improvements observed can be attributed to routine data quality audits, joint supportive supervision and capacity building investments and strategies. Testimonies from health care workers demonstrate that data quality validation approaches used by Solthis made a significant impact, motivated them and improved their knowledge and skills for the benefit of the recipients of care.

### 5.4 Recommendations from the Findings

During the focus group interviews with health care Workers, participants were asked to propose recommendations to improve data validation approaches and performance of health facilities. Taking into consideration all responses provided, good practices and lessons learned, summary of recommendations was provided.

#### 5.4.1 Recommendation for Policy

National data quality validation guideline: The ministry of health should develop and enforce the use of a national guideline with minimum standards to implement harmonized data quality validation approaches and activities. This was frequently mentioned as a recommendation and should be followed by all as it will help to standardize data validation processes at every level of the health care system.

Certification policy: The introduction of certification opportunity by the ministry of health to best performing health facilities in terms of quality service delivery and documentation also came up as recommendation to improve and maintain performance of health facilities. This will motivate health care Workers to work harder and produce good outcome that will contribute to the performance of health facilities.

### 5.4.2 Recommendation for Practice

Extending data quality audit: It was recommended by focus group respondents to extend data quality audit to non-Solthis supported health facilities as well and on more frequent basis which will help to improve the quality of the national data.

Joint Supportive Supervision: During the focus group interviews, it was recommended to increase the frequency of the supportive supervision to at least monthly, making sure that it is an activity that aim to evaluate activities and coach health care Workers

Staff Capacity building: extending capacity building down to the communities came as a recommendation to empower the health care Workers and other support groups to better compliment services offered at health facility level notably on adherence, retention and developing partnership with community groups. It was also recommended to create capacity building platform for exchanges and coordination between health care Workers from other facilities

Mixed capacity building strategies such as classroom training, onsite mentorship, peer mentorship and learning were recommended to maximize understanding and to help build the capacity of health care workers.

## 5.5 Suggestion for Further Study

Since this study was only conducted in thirty-five (35) Solthis supported HFs, it is recommended that further studies be conducted at national level to help understand the national performance of these data validation approaches. This will help to unearth the national level performance and especially the performances of non-donor supported health facilities. The outcome will help to triangulate further methodology, approaches and strategies to influence policies and other decision-making processes.

## References


Abdel-Latif, M. E., et al. (2025). Unstructured Parental Feedback at A Tertiary Maternity Hospital: Implications for Data Quality in Healthcare Settings. *Journal of Perinatal & Child Health.*

Adusei, K., Boateng, F., & Mensah, C. (2023). Challenges and opportunities for data quality management in sub-Saharan Africa. *Global Health Journal, 15*(2), 45–59. https://doi.org/10.1016/j.ghj.2023.02.004

Chimwaza W., Chipeta E., Ngwira A., Kamwendo F., Taulo F., Bradley S., McAuliffe E., (2014). What makes staff consider leaving the health service in Malawi?: *Human Resources for Health 12*, article number 17, (2014)

Chaulagai, C. N., Moyo, C. M., Koot, J., Moyo, H. B., Sambakunsi, T. C., Khunga, F. M., & Naphini, P. D. (2005). Design and implementation of a health management information system in Malawi: issues, innovations and results. *Health Policy Plan, 20*(6), 375-384. doi:10.1093/heapol/czi044

Chowdhury, R., Khan, S., & Ahmed, T. (2022). The role of digital health technologies in improving data validation in low- and middle-income countries. *International Journal of Medical Informatics, 165*, 104827. https://doi.org/10.1016/j.ijmedinf.2022.104827

Devillers, R., et al. (2021). Dynamic Metadata Integration for Enhanced Data Quality. *Data Quality Journal, 34*(5), 301–315.

Ensor, T., Quigley, P., Green, C., Razak Badru, A., Kaluba, D., & Siziya, S. (2014). Knowledgeable antenatal care as a pathway to skilled delivery: modelling the interactions between use of services and knowledge in Zambia. *Health Policy Plan, 29*(5), 580-588. doi:10.1093/heapol/czt044

Felix T.D., (2023). Employee Support System asaFactor forIncreased Staff RetentionTengan Dassah Felix. *International Journal of Multidisciplinary Studies and Innovative Research ISSN: 2737-7172 (O), ISSN: 2737-7180 (P)Volume 11, Number 1, pp. 17-21DOI:10.53075/Ijmsirq/64556745*

Glassman A, S. W. (2011). The Health Systems Funding Platform: Resolving Tensions between the Aid and Development Effectiveness Agendas.

Gonete, T. Z., Yazachew, L., & Endehabtu, B. F. (2021). Improving data quality and information utilization at Metema Primary Hospital, Amhara National Regional State, Northwest Ethiopia 2018: *Capstone project. Health Informatics J, 27*(3), 14604582211043160. doi:10.1177/14604582211043160

Global Fund. (2021). Annual Results Report: Strengthening health systems through data-driven approaches. Retrieved from https://www.theglobalfund.org/en/results

Geoffrey A., Mubarak A., Bangoora C., (2024). Factors Affecting the Performance of Health Workers in Nsiika Health Center IV, Buhweju District. *NEWPORT INTERNATIONAL JOURNAL OF PUBLIC HEALTH AND PHARMACY 5*(2):1 DOI:10.59298/NIJPP/2024/52394819

Harrison K., Rahimi N., Danovaro-Holiday M.C., (2020). Factors limiting data quality in the expanded programme on immunization in low and middle-income countries: *A scoping review 38(30)* 19 June 2020, Pages 4652-4663

Howard T.L., Ulferts G.W., White M., Kohn-Parrott K.A., Bhattacharya M., Srivatsan V., Importance of Data Accuracy and Management in Healthcare: *Journey of Technology Research*

Indicators, A. (2010). Monitoring the building blocks of health systems. *Geneva, Switzerland: WHO Document Production Services*.

Jones, A., Smith, B., & Patel, R. (2023). Impact of data quality on maternal and child health outcomes: A global systematic review. *BMC Public Health, 23*(1), 12–22. https://doi.org/10.1186/s12889-023-15345-8

Jehu, D. A., Bek, J., Bennett, C., & Hackney, M. E. (2025). Digital Learning Innovations for Healthcare Capacity Building: Insights from Dementia Care Programs. Frontiers in Psychology.

Kankam, S. B., et al. (2024). Addressing the Limited Workforce in Neurosurgery in Low- and Middle-Income Countries: The Role of Early Mentorship and Supervision. Neurosurgical Review

Khatri, V., & Brown, C. (2022). Understanding the dynamics of healthcare data quality: A global perspective. *Health Information Management Journal, 51*(3), 167–178. https://doi.org/10.1177/18333583211032990

Kim, J., Achieng, M., & Ouma, L. (2023). Leveraging mobile technology to improve data validation in healthcare facilities: Evidence from Kenya. *African Journal of Health Information Systems, 14*(1), 34–46. https://doi.org/10.4314/ajhis.v14i1.5

Mutale W., Ayles H., Bond V., Mwanamwenge M.T., and Balabanova D., (2013). Measuring health workers' motivation in rural health facilities: baseline results from three study districts in Zambia: *Human Resources for Health* 2013, *11*:8

Mathew Rejani (2024). The Importance of Data Validation in Healthcare System KPIs: *linkedin (13)* The Importance of Data Validation in Healthcare System KPIs | LinkedIn

Magoba B, J. S. S., G. Gebru. (2022). Data used in a DHIS2-based Disease Surveillance system: *Lessons learned from Sierra Leone*. doi:*10*.13140/RG.2.2.20856.62728

Martin D.M, Sloan M.L., Gleason B.L., Wit L.d., Vandi M.A., Kargbo D.K., Clemens N., Kamara A., Njuguna C., Sesay S., Singh T. (2020). Implementing Nationwide Facility-based Electronic Disease Surveillance in Sierra Leone: Lessons Learned: *PMID*: 32004124 PMCID: PMC7465552 DOI: *10*.1089/hs.2019.0081

Makau, J. M., & Kiarie, F. K. (2024). Retention Strategies for Trained Healthcare Staff. International Journal of Economics & Finance

Mohamed Vandi, A. (2020). Data quality audits during post-Ebola recovery: Lessons from Sierra Leone's health system strengthening efforts. *Journal of Global Health Reports, 4*, e2020041. https://doi.org/10.29392/001c.13441

Muthee, V., Bochner, A. F., Osterman, A., Liku, N., Akhwale, W., & Kwach, J. (2019). Improving data quality through routine data quality assessments in Kenya: Lessons from the HIV program. *BMC Health Services Research, 19*, 775. https://doi.org/10.1186/s12913-019-4524-5

Nyungu, L. M., & Wainaina, L. (2024). Strategic Management Drivers and Performance of Level Four and Five Private Hospitals in Mombasa County, Kenya. International Academic Journal of Finance.

Okon, I. I., et al. (2024). Enhancing Quality Oversight in Health Training Programs Through Joint Supervision Models. *Springer Healthcare Review*.

Ojeda-Castillo, V., & Murillo-Tovar, M. A. (2024). Challenges in Sustaining Health Data Audits in Developing Countries

Okwero, P., (2010) Fiscal space for health in Uganda: *IBRD(05)*/W929/no.186

Olawale S.R., Chinagozi O.G., Joe N.O., (2023). Exploratory Research Design in Management Science: A Review of Literature on Conduct and Application: *International Journal Of Research and Innovation in Social Science (IJRISS)* ISSN No. 2454-6186 DOI: *10*.47772/IJRISS/Volume VII Issue IV April 2023

Park, H., Lee, S., & Yoon, J. (2023). Blockchain technology for securing healthcare data: A systematic review of applications and challenges. *Journal of Medical Systems, 47*(1), 8. https://doi.org/10.1007/s10916-023-01853-2

Rowe A.K., Savigny D., Lanata C.F., Victora C.G., (2005). How can we achieve and maintain high-quality performance of health workers in low-resource settings?: *Lancet* 2005; *366*: 1026–35 DOI:10.1016/S0140-6736(05)67028-6

Rwabukwisi, F. C., Bawah, A. A., Gimbel, S., Phillips, J. F., Mutale, W., & Drobac, P. (2017). Health system strengthening: a qualitative evaluation of implementation experience and lessons learned across five African countries. *BMC Health Serv Res*, *17*(Suppl 3), 826. doi:10.1186/s12913-017-2662-9

Robinson J., Raphael D., Moeke-Maxwell T., Parr J., Gott M., (2023) Implementing interventions to improve compassionate nursing care: A literature review. *Int Nurs Rev*. 2024;71:457–467DOI: *10*.1111/inr.12910

Rizopoulos D., Taylor J., (2024). Optimizing dynamic predictions from joint models using super learning: *Research gate* DOI:*10*.1002/sim.10010 LicenseCC BY-NC 4.0

Rao S., (2024). 10 Common Data Quality Issues (And How to Solve Them). https://firsteigen.com/blog/10-common-data-quality-issues-and-how-to-solve-them/#:~:text=Data%20quality%20issues%20often%20arise,contributes%20to%20data%20quality%20degradation.

Smith, J., Johnson, P. (2022). The Impact of AI on Medical Data Analysis: A Case Study of IBM Watson Health. *Journal of Health Informatics, 45*, 145-156.

Smith, L., & Lee, K. (2021). Data-driven decision-making in healthcare: The role of data validation in improving patient outcomes. *Health Policy and Technology, 10*(3), 100551. https://doi.org/10.1016/j.hlpt.2021.100551

Sohrabi, S., Garavand, A., & Ahmadian, L. (2022). Effectiveness of data validation techniques in hospital information systems: A case study. *Journal of Biomedical Informatics, 128*, 104011. https://doi.org/10.1016/j.jbi.2022.104011

Sharma J., Dhar R.J., (2016). Factors influencing job performance of nursing staff: Mediating role of affective commitment. *A Journal of People, Work, and Organisations Issue* (s) available: *308* – From Volume: 1 Issue: 1, to Volume: 54 Issue: 1

Tshiyoyo M., (2022). The Changing Roles of Non-Governmental Organizations in Development in South Africa: Challenges and Opportunities. DOI: *10*.5772/intechopen.107015

Tu J., Wang C., Wu S., (2015). "The internet hospital: an emerging innovation in China," *The Lancet*: Global Health, Elsevier, Aug 2015

WHO (2019). Standards for improving quality of maternal and newborn care in health facilities: *(NLM classification: WA 310)* ISBN 978 92 4 151121 6

Wang Q, et al. (2021). Structural insight into the SAM-mediated assembly of the mitochondrial TOM core complex. *Science 373*(6561):1377-1381

World Health Organization. (2022). Global Health Data Report: Strengthening health information systems worldwide. Geneva: WHO. Retrieved from https://www.who.int/data/gho

WHO, (2020) Training for mid-level managers (MLM). Module 4: supportive supervision. World Health Organization 2008, republished 2020 under the *CC BY-NC-SA 3.0 IGO licence*

World Health Organization, (2022). Health workforce.

Zhang, Y., Chen, M., & Liu, X. (2023). Artificial intelligence in healthcare data validation: Current applications and future prospects. *Journal of Artificial Intelligence in Medicine, 67*, 102098. https://doi.org/10.1016/j.artmed.2023.102098

Campbell S., Greenwood M., Prior S., Shearer T., Walkem K., Young S., Bywaters D., Walker K., (2020). Purposive sampling: complex or simple? Research case examples J Res Nurs. 2020 Jun *18*;25(8):652–661. doi: 10.1177/1744987120927206

# APPENDICES

## APPENDIX I: RESEARCH QUESTIONNAIRE

### FGD with Healthcare Workers

**Instructions**

- Explain the purpose of the study and politely request the respondent for permission to proceed.
- Record the group discussions
- Ask participants to switch off their phones during this period.
- One Person Talking at a Time: Inform the group that only one person should speak at a time to keep notes. Ask the participants to signal you if they have something to say.

Hello. My name is ……, and I am part of the team conducting this academic study. The proposed study will contribute to generate knowledge on how Solthis has supported your facility in data validation and the performance of your health facilities.

Quantitative data will also be collected from the review of data in your registers, summary books and DHIS2, and we will be interviewing healthcare workers from other Solthis supported health facilities. Therefore, your honest and genuine participation in responding to the questions prepared is essential and highly appreciated. This interview will last for a maximum of 30 minutes.

**CONFIDENTIALITY**

We would like you to answer some personal questions. Your answers are completely confidential, and participation is voluntary. You are assured that all your answers will remain confidential. The answers will on be used for academic purposes and on a “No–Name Basis,”.

However, your honest answers to the subsequent questions will help us better capture how Solthis support over the years has contributed to the performance of your health facilities. Please note that we will be recording this interview. We would greatly appreciate your help in participating in this study. Would you be willing to participate? YES / NO?

Yes, proceed.

Do you have any questions?

Thank you for being so cooperative!!!!

| | | | |
|---|---|---|---|
| **ID01** | Region | **ID02** | District |
| **ID03** | Respondent's Type: | | |
| **ID04** | Facilitator | **ID05** | Date of FGD |
| **ID06** | Number of People in Group | | |
| **Interview Start Time** | | **Interview End Time** | |

Qualitative data will be recorded using digital voice recorder, transcribed and analyzed using Atlas ti software,

1. To gauge respondent's understanding of data validation and performance of facilities
   a) What do you understand by data validation?
   b) What data validations activities have been supported by Solthis in your facility?
   c) How frequently were these data validation activities done?
2. To gauge respondent's understanding of performance of facilities
   a) What do you understand by performance of health facility?
   b) What kind of activities have been supported by Solthis that contributes to the performance of your facility?
   d) How frequently were these activities conducted?
   e) What were the most frequent themes the activities focused on?
3. For each of the following activities, describe how it was conducted and how often:
   a) Data quality audit
   b) Joint supportive supervision
   c) Staff capacity building
4. What are the benefits/advantages and limits of the **each** of the activities listed in question 3?
5. Describe how the activities in question (3) have help you in your work

6. Which of the activities in question (3) do you consider the most important and Why?
7. Which activity do you consider to provide the most practical support to care? Explain why?
8. Do you consider that the activities in (3) above will improve health facility performance and quality of care? Why?
9. What factors in your experience limit your capacity to provide quality care despite support provided by slothis? Can you explain how those factors negatively influence health facility performance and quality of care?
10. Which of the activities in question (3) above has led to the most significant change in the performance of your work? How?
11. Apart from the activities in question 3 above, what other benefit do you or the facility receive from Solthis that motivate your work or health facility performance?
12. What recommendations would you give to improve data validation and health facility performance activities and strategies?

**Closing** – Thank you for participating in this discussion. Do you have any questions or comments for us? We do appreciate your contribution and honest opinions.

## APPENDIX II: ANU LETTER OF RESEARCH AUTHORIZATION

*8th April, 2025*

E-mail: researchwriting.mba.anu@gmail.com/ monitoringandevaluation@anu.ac.ke

***Our Ref: (21J01DMME011)***

The Program Manager,
National HIV/AIDS Control Program
Freetown, Sierra Leone

Dear Sir/Madam:

**RE: RESEARCH AUTHORIZATION FOR:** Joseph Sama Gassimu (21J01DMME011)

Joseph Sama Gassimu is a postgraduate student of Africa Nazarene University in the Master ARTS IN MONITORING AND EVALUATION (MME) program.

In order to complete his program, Gassim is conducting a research entitled: "**Data quality validation and performance of donor supported health facilities in Sierra Leone. A case study of Solthis Sierra Leone"**

Any assistance offered to him will be highly appreciated.

Yours Faithfully,



**Dr. Wanjiru Nderitu**

**MME, Coordinator,**

**School of Business,**

**Africa Nazarene University.**