INFLUENCE OF ORGANIZATIONAL FACTORS ON DATA QUALITY: A CASE OF HIV AND AIDS DATA MANAGEMENT IN HEALTH FACILITIES OF BUJUMBURA MAIRIE PROVINCE, BURUNDI

RUKUNDO STANISLAS

A RESEARCH PROPOSAL SUBMITTED IN PARTIAL FULFULMENT OF THE REQUIREMENTS OF THE AWARD OF THE DEGREE OF A MASTER OF ARTS IN MONITORING AND EVALUATION OF

MOUNT KENYA UNIVERSITY

JULY 2024

DECLARATION AND APPROVAL

Declaration

The present proposal is my own work and has not been submitted for consideration for a degree at any other university or for consideration for any other honor.

Signature Date: 27th July 2024

Name: RUKUNDO Stanislas

MAME/2020/69027

Approval by the supervisor

I confirm that the work described in this proposal was completed by the candidate under my supervision.

Signature  Date: 30th July 2024

Prof. Kennedy Mutundu

Department of Social and Development Studies

Mount Kenya University

DEDICATION

This study is dedicated to Ada Shaw for her support and motivation which enabled me to fulfil this master's degree.

ACKNOWLEDGEMENT

First my appreciation and gratitude goes to almighty God for the guidance, strength and wisdom that has assisted me in carrying out this study. Additionally, I desire to immensely to extend my profound and deepest recognition and appreciation to my supervisor Prof. Kennedy Mutundu for relentlessly directing as well as supervising my research work. He gave me hope and assurance which ultimately enabled me to complete my study on time. I would also like to extend my appreciation and thanks to Mount Kenya University for availing a conducive environment that has assisted me in completing my studies. Special thanks to the staff at Burundi office for your commitment and punctuality in addressing my needs.

ABSTRACT

Data quality is still an issue in health facilities since data reported into DHIS2 is different to those shared with other implementing partners intervening in HIV/AIDS program as well as the data source (registers and other documents used at the health facility level). Therefore, the intention that guided this study was to document how organizational factors determines HIV and AIDS data management in Bujumbura- Mairie's health facilities. The study was guided by the following objectives; Influence of capacity building on the quality of HIV/AIDS data management, influence of incentives and rewards on the quality of HIV/AIDS data management, and influence of organizational structure on the quality of HIV/AIDS data management. To guide this research study, two theories were used, namely Rationality Decision making model and Carbone's Evidence-Based Health Information System. A mixed research approach was used to collect data from targeted health facilities using a questionnaire installed into KoboCollect. Bujumbura-Mairie has 199 health facilities, of which 66 offer comprehensive HIV and care management to beneficiaries. The population that was targeted by the study was 273 among them 200 Health providers working in HIV care management services and 73 health management information system (HMIS) of the 66 health facilities. Stratified random sampling technique was applied. Therefore, the sample size of the study is 194 from the two categories of health facility staff. Collected data was analyzed using SPSS, as data was collected using kobo-collect tool. From the findings the capacity building, organizational structure, incentives, and rewards have a positive influence on the data quality for health facilities. In conclusion the study determined that there is a robust correlation involving data quality and capacity building in health facilities of Bujumbura Mairie province, Burundi ($r=0.833$, $p=0.000$), incentives and rewards was also determined to have a robust as well as positive relationship with data quality ($r=0.777$, $p=0.000$). Organizational structure was determined to command a strong as well as positive association with health data quality of ($r=0.603$, $p=0.000$). To summarize, the research found out that the variables of the study such as capacity building, organizational structure and incentives and rewards commands a robust as well as favorable association with the health data quality.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS AND ACRONYMS

DHIS2: District Health Information System 2

DQA: Data Quality Assessment

HMIS: Health Management Information System

HIS: Health Information System

HD: Health District

HIV: Human Immunodeficiency virus

AIDS: Acquired Immune Deficiency Syndrome

IST: Infection sexuellement Transmissible (Sexually transmitted Infections)

M&E: Monitoring and Evaluation

MOH: Ministry of Public Health and the Fight Against AIDS

NGO: Non-Government Organization

PLHIV: People Living with HIV

PNLS : Programme National de Lutte contre le SIDA (National AIDS control program)

QM: Quality Management

TQM: Total Quality Management

WHO: World Health Organization

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Fierce as well as stiff competition globally today especially in the era of big data requires organizations to ensure the quality of data being applied in determining decisions that are going to be adopted by organizations is of exceptional standards since unreliable combined with inaccurate data can make administrators make poor decisions which will be a disaster to organizations (Wang, Liu, Li, Lin, Sindakis, & Aggarwal, 2023).

Important to note that accurate, reliable and consistent data is vital and requisite to keep track of the advancement or progression an organization is making with regards to its goals and objectives. Accurate and reliable data is essential for adjusting interventions leading to decision making. In addition, according to reports published on health data quality and systems underscored the importance of enhancing data quality that is vital in developing strategies as well as future programming. So, the standard of data may be determined or impacted by numerous facets and considerations including capacity building, incentives, and rewards, as well as organizational structure. A health management system requires an optimum functioning and well-coordinated ways to gather, analyze and present data that will be applied in making effective decisions for the appropriate stakeholders including health providers, individuals, government agencies, policy makers among other stakeholders (Cheburet & Otieno, 2016).

According to Bill and Melinda Gates Foundation (2015), ideal health information system should equip and empower health workers with capacities to apply regular and routine data they gather as well as appreciate the usefulness of high-quality data that will ultimately enhance health outcomes.

Global health programs and systems that are geared towards ensuring that there is sustainability as well as maximum performance have continuously faced challenges of high demand for timely and reliable data that will be used in planning and objective decision-making. Therefore, lack of robust data management system is a danger to attaining the correct measurement as well as transparency of outcome of health programs that are being implemented Cheburet & Otieno, 2016). In addition, pertinent, punctual, overarching as well as pertinent data is vital for efficacious integration of health care framework components in making sure there is accessibility and availableness of sufficient resources in buttressing health system (WHO,2007). PEPFAR (2023) observed that there is need to have adequate investments in staffing as well as information technology inorder to make sure that elemenents of data quality are enhnaced.

Globally, Samansiri B.A.D (2014) observed that in Sri Lanka a lot of information that is being by health facilities are mainly paper based, information subsystems especially on disparate vertical programs are not desegregated and are in many cases disjointed. Additionally, the flow of information is mostly in the ascending direction and there is limited element or component of feedback from the concerned stakeholders.

In conclusion, there is a need to develop a policy guideline on data collection, management and application of data, which will eventually enhance data sharing between public and health facilities and increase the number of trained personnel for the whole process to be effective.

In Malawi, the ministry of health intensified efforts geared towards enhanced data quality in the health sector by implementing National Antiretroviral Therapy Electronic Medical Record system. The system was expected to make sure that data generated was of great quality, which will lead to generation of quality reports as well as prompt and timely reports. Nevertheless, the system did not address these challenges hence generated reports were in many cases in deficient, sketchy,

inaccurate, and inconsistent thereby requiring constant cleaning which will ultimately lead to delays in releasing reports (Nkhoma & Kondwani , 2021).

In Ethiopia various strategies have been implemented as per the guidelines of WHO to improve routine as well as planned health information system at disparate delivery levels. Some of these guidelines were connected to production of accurate, reliable data and ultimately utilization of the collected data for effective implementation and evaluation of health programs. However, these strategies have been challenged and hindered by low level of quality of data application which has been found to be disconcerting and unsatisfactory (Tilahun, et al., 2021). Several factors that have hindered data quality and optimal utilization of data in health programs in Ethiopia were identified as incompleteness, inconsistency, irrelevance and poor feedback mechanisms (Asemahagn , 2017). In Kenya, the issue of data quality was recognized as one of the key challenges facing health sector. Most health providers were found to have data that has a high degree of unreliability as well as inaccuracy (Kenyenga, 2022).

Moreover, Kenyenga (2022) concurred that it is imperative for health providers to design and establish strong and meticulous controls of collected data as well as providing an effective data categorization instruments that have the capability of scrutinizing every facet of the data, its consistency and whether there is any abnormality, peculiarity and ultimately its completeness.

In Burundi, the HIV/AIDS interventions are implemented through the Ministry of Public Health and Fight against AIDS (MOH) through the National AIDS Control. The PNLS/IST/HV mission is to lead sustainable implementation of HIV plan of actions in Burundi by using a collaborative approach aiming to involve all stakeholders and donors.

Burundi has experienced increased donor funding in programs that are aimed at controlling and prevention of diseases in emerging nations.

As far as HIV program data is concerned, data is collected from health facilities standard registers and reported through the National Information System (DHIS2). In addition, HIV data are shared with other partners implementing different HIV projects using paper-based templates. The data reported into DHIS2 may differ to those shared with other implementing partners even though they are reported by the same health facility. This situation raises to question the data quality of health system in Burundi.

The quality of data can be evaluated or assessed while taking into consideration the following factors: correctness, regularity, dependability, viability, and completeness. Assessing the standards of information or statistics may help health facilities to track inaccuracy of data for any remediation action and evaluate if the database fits the intended objective. However, in the context of health facilities, the focus is directed on the quality of data since any decision or future programming is derived from data. Therefore, data quality is an important element of the whole process of data management for any organization and actions undertaken to boost the standards of information that is often closely linked to program data management.

In Burundi, the standard of information may be influenced by how health facilities are organized. The term “organizational factor” surrounds all elements that have any influence or impact on the way health facilities operate. These elements include: (i) formal data management systems, (ii) data assurance processes, (iii) working practices, (iv) risk awareness, and (v) how the organization learnt from experience.

In addition, the organizational structure in healthcare facilities tends to focus on efficiency and oversight of services provided to beneficiaries. Though many health facilities may differ in framework whether large and small, most of them follow accepted models of hierarchy which are well-established in their business domains. The management of health facilities is handled by directors for hospitals and responsible for health centers who are designated by the Ministry of Public Health (MOH) for government health facilities while for private health facilities, the role of MOH is to validate the appointed team. The Directors or responsible are chosen from hospital or health centers professionals like doctors, nurses, and health providers.

As far as data management is concerned, in health facilities, the management of data is done through the health information system database (DHIS2). As far as data recording into DHIS2 is concerned, the focal point must gather data from each service within the health facility and compile them into one monthly, daily, or weekly report using a standard report template (paper-based report template). For any data discrepancies, the focal point person must interact with the head of different health services for any correction. Even if the focal point may have feedback regarding data discrepancies, there is no internal data verification system and ongoing communication at the health facility level prior to data validation into the national DHIS2 database and submission to other stakeholders.

In addition, data quality in healthcare facilities must be accurate, consistent, and relevant. Therefore, to improve the data quality, the health facility should set-up a data collection, reporting, recording (into database) and verification system which enables the DHIS2 focal point to early track data discrepancies before validation into the DHIS2.

Furthermore, the structure of an organization depends upon the system set to direct the implementation of activities to meet the organization goals. This includes the duties as well as

obligations of every member of staff working within the organization. The organizational factors may be internal or external. Internal factors are used to promote the quality of service, and it includes organizational structure, competence of employees, employees' collaboration, leadership, and management. Another internal element to consider is the working environment because it has an influence on the way employees work. To enhance provision of services to beneficiaries, factors such as engagement of employees and performance management should be regarded as fundamental elements in providing quality healthcare services to beneficiaries.

1.2 Statement of the Problem

Data quality according to Sanga (2015) is one of the most crucial areas that organizations need to strengthen to ensure that health care services are delivered effectively and efficiently. Information systems that have a strong attribute of sound and reliability are the important foundations to ensure effective policy development, program execution and administration, regulations, research and development as well as financing (WHO 2008). We are currently living in an age where there is a lot of information that is being generated and disseminated to a lot of people worldwide. However, this huge amount of data does not consider putting huge emphasis on the standards of data (Kenyenga , 2022).

Additionally, Kenyenga (2022) observed that a lot of data that we access, and use are in many cases unreliable and inaccurate. Data quality has been identified as a fundamental challenge that has hindered effective implementation of HIV/AIDs programs as well as interventions (Chiba, Oguttu, & Nakayama, 2012). Additionally, Bisore and Mbanye (2020) concurred that it is going to be challenging for health facilities in Burundi to boost their performance and become effective when the quality of data they are using is uneven. Health facilities therefore need to gather data that is complete, timely and accurate for them to effectively deal with HIV.

In many environments that have limited resources, data that has a high degree of accuracy, persistently obtainable, authentic across health systems magnitude and precise is in many cases unavailable (Gimbel, Mwanza, Nisingizwe, Michel, & Hirschhorn, 2017). Low standards for data eventually brings about instances of defective decision making processes, ineffectual allotment of resources, deprivation of trust in the overall framework of health in the country which could ultimately imperil the soundness and rationality of the evaluations. According to Data Quality Audit for HIV Program Indicators in Burundi of 2021 data quality was identified as key challenge that is hindering effective implementation of HIV programs in Burundi. There is a need to analyze organizational elements that sways the standards of HIV/AIDS information since data reported into the national database (DHIS2) has been shared to be different implementing partners using paper-based reporting tools. These data reporting discrepancies are seen when comparing national HIV/AIDS data pivoted from DHIS2 as well as the data that is presented by implementing partners. If the problem of the quality of data is not addressed, it will have a negative impact on future HIV projects' design and lead the country into faulty planning regarding HIV interventions. Although data quality is of huge importance in implementation and evaluation of HIV Programs in Burundi, there are limited studies that have been conducted to find out organizational elements that influence data quality in this sphere hence the need for the study.

1.3 Purpose of the study

The purpose of this research was to determine the influence of organizational factors on data quality: a case of HIV and AIDS data management in health facilities of Bujumbura Mairie province, Burundi.

1.3.1 Objectives of the Study

(i) To determine the influence of capacity building on the quality of HIV/AIDS data management in the health facilities of Bujumbura Marie Province, Burundi

(ii) To examine the influence of incentives and rewards on the quality of HIV/AIDS data management in health facilities of Bujumbura Mairie Province, Burundi

(iii) To find out the influence of organizational structure on the quality of HIV/AIDS data management in health facilities of Bujumbura Mairie Province, Burundi

1.4 Research Questions

(i) Does capacity building have influence on the quality of the HIV/AIDS data in health facilities of Bujumbura Mairie Province, Burundi?

(ii) To what extent do incentives and rewards have an influence on the quality of the HIV/AIDS data in health facilities of Bujumbura Mairie Province, Burundi?

(iii) Does the organizational structure have an influence on the quality of the HIV/AIDS data in health facilities of Bujumbura Mairie Province, Burundi?

1.5 Justification of the Study

Due to the fact there are numerous problems that have not been solved in connection with data gathering, processing and application in various health institutions, there are still challenges that are experienced while trying to convert data into additional functional and applicable information especially in the current atmosphere that has high element of interconnectivity (MOH, 2016). Each and every industries including agriculture, logistics, shipping among others depend to a very large

extent on gathering data, analyzing and ultimately applying that data in making objective decisions both at national as well as global level.

This process of data management should be highlighted in order to make the process more effective. If not carefully observed data collection and analysis process can be ignored especially by organizations that are not profit oriented especially health facilities that are involved in management of HIV (Njuguna, 2022).

This study was conducted to identify and address challenges that impacts the standards of HIV/AIDS information in health facilities of Bujumbura-Mairie province (Burundi). The findings of this study will provide significant enhancement on health statistics because it will help to address the gaps of standards of data as outlined in the statement of the problem of this research. In addition, the findings of this study will inform the audience and other stakeholders of organizational elements impact on the quality of HIV/AIDS in Bujumbura Mairie health province.

This study is also critical for data collection, recording, verification, and reporting process aiming to close the gap related to discrepancies of reported data in DHIS2 and other implementing partner's databases.

1.6 Limitations of the Study

The present study was limited to the influence of organizational factors on the quality of HIV/AIDS data in 66 health facilities providing HIV care services of Bujumbura-Mairie province. Additionally, since the HIV program information is not easily accessed to any individual, some health providers may be reluctant to complete the questionnaire due to the institutional confidentiality policy. To deal with this challenge, a letter from the university introduced the

researcher to Bujumbura-Mairie health province Director who then provided another letter to allow healthcare providers to freely complete the questionnaire or interact with the researcher. Ultimately, some healthcare providers may not be cooperative to complete the questionnaire due to their routine activities or workload at the health facility. To cope with this issue, a prior appointments approach was used to avoid clashing with their daily activities.

1.7 Significance of the Study

This study is going to assist health providers of Bujumbura-Mairie health province to understand and be aware on the importance of reporting quality data in both DHIS2 and monthly reports shared with other stakeholders and HIV projects implemented by Non-Government Organizations (NGOs). It will also guide them on the importance of data analysis and verification before recording them into DHIS2 as well as its transmission to different audiences.

In the same way, this research will provide a reference especially for subsequent scholars who may wish to work on similar topics. In addition, this work will constitute the raw materials and information for those who routinely analyze and use health data as it will inform them on elements that may impact or determine the standards of information, especially in Burundi.

1.8 Scope of the Study

The research covered the time limit, content, geographical area, research methodology, design, and instruments as well as the hypothetical structure. The period of the study was ten months from March 2023 to December 2023, including the proposal development, data collection and analysis. This study analyzed how organizational elements impacts on the quality of HIV/AIDS data in Bjumbura-Mairie province. Bujumbura Mairie health province was selected to carry-out this study because 60% of PLHIV are followed in this health province.

In addition, Bujumbura-Mairie has 199 health facilities (public, private and faith-based), of which sixty-six (66) are offering a full comprehensive HIV care and treatment to beneficiaries as well as PLHIV. Additionally, a mixed research procedure was adopted to collect data from health facilities

1.9 Delimitations of the Study

The study took place in Burundi, especially in the 66 health facilities providing HIV care services in Bujumbura-Mairie. As Bujumbura-Mairie province has three health districts, the study covered all health districts according to the targeted health facilities. The expected timeline for the study is for 9 months from April1st to December 2023. Moreover, the study targeted health providers working in the HIV care service as well as health management information system staff.

1.10 Assumptions of the Study

(i) The research presumed that organizational factors have an influence on the HIV data quality in Bujumbura-Mairie health province,

(ii) The research anticipated that selected participants (health providers and HMIS) will have knowledge on data collection and reporting,

(iii) Through this research it is assumed that outlined variables will have an impact on HIV data quality in Bujumbura-Mairie health province.

1.11. Operational Definition of Key Terms

Capacity building

In this study capacity building will be the procedure used to improve one's knowledge and skills enabling individuals to perform their work well. E.g., Train health care providers on data collection and reporting tools may

Incentives and rewards

In the current study, incentive is determined as something, which motivates individuals to perform a given task while a reward is something, which is given to someone after completing the task. For example, if you give one of your employees a gift for their hard work, that is a reward.

Organizational structure

In the present study, organizational structure is a hierarchical organigram of an organization, which states the role of employees and how they are governed. The organizational structure describes the tasks of employees and to whom they must report to. In addition, the organization structure shows the employees' titles and basic hierarchies.

Data quality

In this study data quality is the status of data that will be measured based on the following dimensions: accuracy, completeness, consistency, reliability. In other words, it attributes the nature of qualitative or quantitative data which serves as reference in decision making as well as planning.

Data management

In the current study data management is the procedure of gathering, keeping, organizing, as well as using data in a secure manner to support any program implementation and lead to good decision-making. For example, when implementing a project, there must be a data management system put in place to guide the intervention and leads to secure storage of project data.

LITERATURE REVIEW

2.1. Introduction

Any scientific research must rely on other similar works for support and this study is not an exception to the rule. Therefore, the present chapter is to appraise and explore studies of various researchers carried out in the similar areas to the present study. However, the literature review focused on the following themes: capacity building, incentives, and rewards as well as organizational structure.

2.2. Empirical Literature Review

Regarding the present study, the empirical literature review included capacity building, organizational management, incentives and rewards, as well as organizational framework influences on the standards of data in general and particularly HIV/AIDS data. The present study focused on the following variables: (i) Capacity building, (ii) incentives and rewards, (iii) and organization structure. These variables helped the researcher to have an overview of their influence on the quality of HIV data.

2.2.1. Capacity Building and Data Quality in Health Facilities

An organization or individual business, employees may need some skills to enable them to perform their duties well. To do so, capacity building activities through training or coaching sessions may be useful**.** Therefore, Capacity building is a procedure used to boost the proficiency and expertness of individuals enabling them to improve their performance in the workplace or elsewhere.

So, individuals or employees' work fulfilment may positively be impacted by capacity building activities. Odhiambo and Iravo (2018) observed that capacity building is crucial, essential and statistically significant in ensuring that services in health facilities are enhanced.

In addition, Elnaga and Imran (2013) asserted that there is a fundamental and critical role that is played by the administrators of an organization in building the capacity of employees as well as establishing an operating environment that is effective and efficient. To reach this, at workplace, employee would benefit for any training program whether online or through classes with the aim of improving their capacities and skills.

Hu, Rao, and Sun (2006), state that the support of the manager requires the establishment of suitable and reasonable working conditions, while capacity building deals with improving employees' knowledge in a given work area.

In the context of health facilities in Bujumbura Mairie, health providers have limited knowledge on data quality assurance, management, collection, and reporting tools. To boost the standards and levels of health facilities data, health providers should be trained in the administration of data collection, verification, analysis and reporting instruments.

In addition to the training organized through workshop sessions, health providers should continuously receive onsite technical assistance or coaching visits to build their capacity in terms data collection, completeness, and usage. This activity should be conducted on a regular basis through supportive supervision visits conducted by the health information system team or partners to boost the standards of data reported by health facilities.

In brief, a good and structured HMIS is necessary to improve health service delivery. However, evidence shows that the standard of data is low, and it remains a major challenge in decision making. In addition, when analyzing the data reported into the DHIS2, it is noticeable and clear that the general standards of data was low in comparison to the standards at the national level as data under and over reporting is observed due to health providers' lack of knowledge on data quality. To address this situation, the health district staff need to incorporate in their supervision

visit plan the aspect of capacity building on data quality to familiarize health providers with HMIS activities.

2.2.2. Organizational Structure and Data Quality in Health Facilities

Organizational structure is an arrangement which traces the manner in which operations are organized and outlines the reporting flow among employees within an organization. In addition, an organizational structure is a non-centralized framework that allows organizations and individual employees to exercise maximum level of independence.

The organizational structure in health facilities tends to focus on efficiency and oversight. Though many health facilities may differ in framework depending on the size (small or large) most of them have the same model of hierarchy or governance.

In Burundi context, data is managed by the HMIS staff in health facilities. To record data into the national database, the latter must gather data from different health services within the facility. For any data discrepancies, the HMIS person must interact with those involved in data collection and reporting for any correction, but there is no internal data verification and analysis system before the data recording and validation into the national database (DHIS2).

All over the world, the HMIS is an important element in framing the national health system. To successfully improve data management inside the health system in Burundi, the HMIS and health providers play a key role even though data may be affected by several factors.

In addition, the HMIS data are considered as the primary source of data to be used by decision-makers since data recorded in DHIS2 helps to track the system performance and progress, analyze the impacts, and ensure accountability. Therefore, the HMIS data are of paramount importance

because it enables MoH and other stakeholders to orient the interventions and guide the decision-making activities.

In Bujumbura Mairie province as well as the whole country (Burundi), health data are recorded into DHIS2 database by appointed staff, but that staff is not mandated to collect data from different services within the health facility through standards tools (registers) as his role is only to record data into the system at a centralized level. The fact that data are not recorded in each health service level may have an influence on the quality of data since the HMIS staff may wrongly record data into the system.

Based on the above hypothesis, the organizational structure in health facilities may be updated to enable each health service to record data into the national health system (DHIS2) to avoid data recording or typing errors.

2.2.3. Incentives and Rewards and Health Data Quality

To improve data quality in health facilities, various approaches may be used while targeting the heath facilities' staff, namely incentive and rewards approaches.

In addition to the incentive approach, performance-based financing can be used to stimulate or motivate employees. Since 2006, the Government of Burundi adopted a policy of free healthcare targeting childbirth and children under five years old. To boost the standards of health services provided to beneficiaries, the MOH introduced performance-based financing to motivate health providers. Through this approach, each health facility is graded and rewarded according to the quality and performance of targeted indicators.

According to Renaud, Adrien 2013 study, the performance-based financing increased the percentage of mothers that are currently delivering in health facilities by 22 % and 5% of women using modern contraceptive methods.

As a definition, an incentive is an activity implemented to motivate individuals to perform a given task whereas a reward is something given in recognition of service delivered. As far as the workplace is concerned, a reward may be given to an employee to value his/her effort, whereas an incentive can be seen as a motivating factor. Rewards and incentives, when used appropriately, can be highly effective motivators for employees.

2.3. Theoretical Literature Review

A theoretical literature review scrutinizes and appraises contemporary and pertinent works that are relevant and connected to this study. It adopts a thorough and exhaustive approach that is also analytical and purposeful. Theoretical framework on the other hand is concerned with elucidating the phenomenon that is surrounding the current study as well as compatible presumptions that were espoused by the current study. Theoretical framework therefore is a configuration that grasp and strengthen a theory that is applied in a given study.

According to Karas and Laura B (2014), a Literature Review is an analysis of other similar works, books, and other sources which are relevant and provide basic knowledge to the topic of study. In the same way, literature reviews are used to identify and censure the existing documentation on a topic to give grounds for the research by exploring divergence in the current research. This research used two theories, namely Rationality Decision making model and Carbone's Evidence-Based Health Information System.

2.4 Theoretical Framework

Theoretical framework is described as a fundamental analysis of extant and functioning hypothesis in order to act as a blueprint for a researcher to be succeed in developing and supporting point of views and line of reasoning that will be used in a given study. Theoretical framework to put it in another way, establishes and illustrates a theory in order to provide an explanation on why the research problem of the study is existing. Theoretical framework was applied in this study to validate and put the study into perspective.

2.4.1 Rationality Decision making model

The researcher adopted Rationality Decision making model that was brought forward by Donelson Forsyth in 1990. The Rationality Decision making model hypothesize that for a decision-making endeavor to be effective there must be an element of rationality. According to Turpin & Marais, 2004 individuals using rationality in making decisions are striving and aiming to attain set out goals in a methodical way whereby they gather all pertinent data, examine and refine data and evaluate the data and ultimately make choices. When decisions are made rationally, facts are usually the foundation and facts are arranged in a systematic way.

For a decision-making process to be rational, there is a need to ensure there is objective data as well as sanctioned and accepted procedure of data analysis as opposed to decision making process that is guided by subjectivity, opinions and intuition. The model of rational decision-making process surmise that the person making the decision has complete or ideal information concerning available options, it also presupposes that the decision maker has the time, intellectual capacity and the necessary resources to appraise every option in relation to other available choices.

It assumes that people will choose options that will enhance their benefits and reduce costs involved (Njoka , 2015).

Rationality Decision making model embeds within it the logic of normal decision making whereby there is an assumption that the individual making decision is indeed using information when it was presented to them and the decision maker comport themselves in a manner that is consistent with the information. Nevertheless, for many years it has been accepted from regular observations that the decision makers collect information but again ignore it therefore making decision making first and search for pertinent and admissible information later (Mutemwa, 2006).

Rational decision-making model is a multiphase process for choosing between various available options. The procedure of undertaking rational decision-making advocates and champions argumentation, objectivity and exploration as opposed to application of personal opinions and intuitions. Rational decision-making model observe a successive as well as formal trackway of various activities. This formal trackway includes a) workout a goal(s) b) distinguish the yardstick or benchmark that is used for coming to a conclusion c) distinguish options c) Carry out audit and d) Determining an ultimate verdict Njoka, 2015).

It is note-worthy to mention that rational-decision-making model does not contemplate and appraise non-quantifiable factors for example ethical concernments or the value of compassion and goodwill. It pretermits and overlooks rumination of individual feelings, allegiances or sense of responsibility. Therefore, its insistence on quantitative data brings along a prejudice inclining toward fondness for facts, data and exploration over instincts.

However, the fundamental strong point of rational decision-making model is that it gives out a framework, direction as well as the strictness that is necessary for an effective decision-making

process thereby making sure that comprehensive factors that are connected to decision, in a sensible and extensive manner is considered. This theory fits in the study since use of data in decision making is vital since it will make sure that the decision that are made are objective devoid of subjectivity and intuition.

2.4.2 Carbone's Evidence-Based Health Information System Theory (2009).

The study was buttressed by Carbone's Evidence-Based Health Information System Theory. This theory was developed by Carbone in 2009. This theory was adopted by the researcher since it supports the need for organizations to have information that is based on evidence for the purposes of daily running of the organization, planning as well as formulation of policies necessary for the overall development of organization. Carbone (2009) observed that it is vital for organizations to consider applicable and pertinent data framework presuppositions when choosing and adopting contemporary technologies for data collection for healthcare settings. Researchers intimated that what is required for data framework to operate optimally was a proper connection between technical subsystems and social subsystems (Schneberger & Wade, 2006). Technical subsystems are composed of gadgets, instruments and procedures that are required to change intakes into outputs to increase the productivity or output of a given organization effectively and efficiently. Social systems are composed of staff at different departments and levels as well as the competence, experience, convictions, moral codes they bring to the work environment (Clegg, 2000).

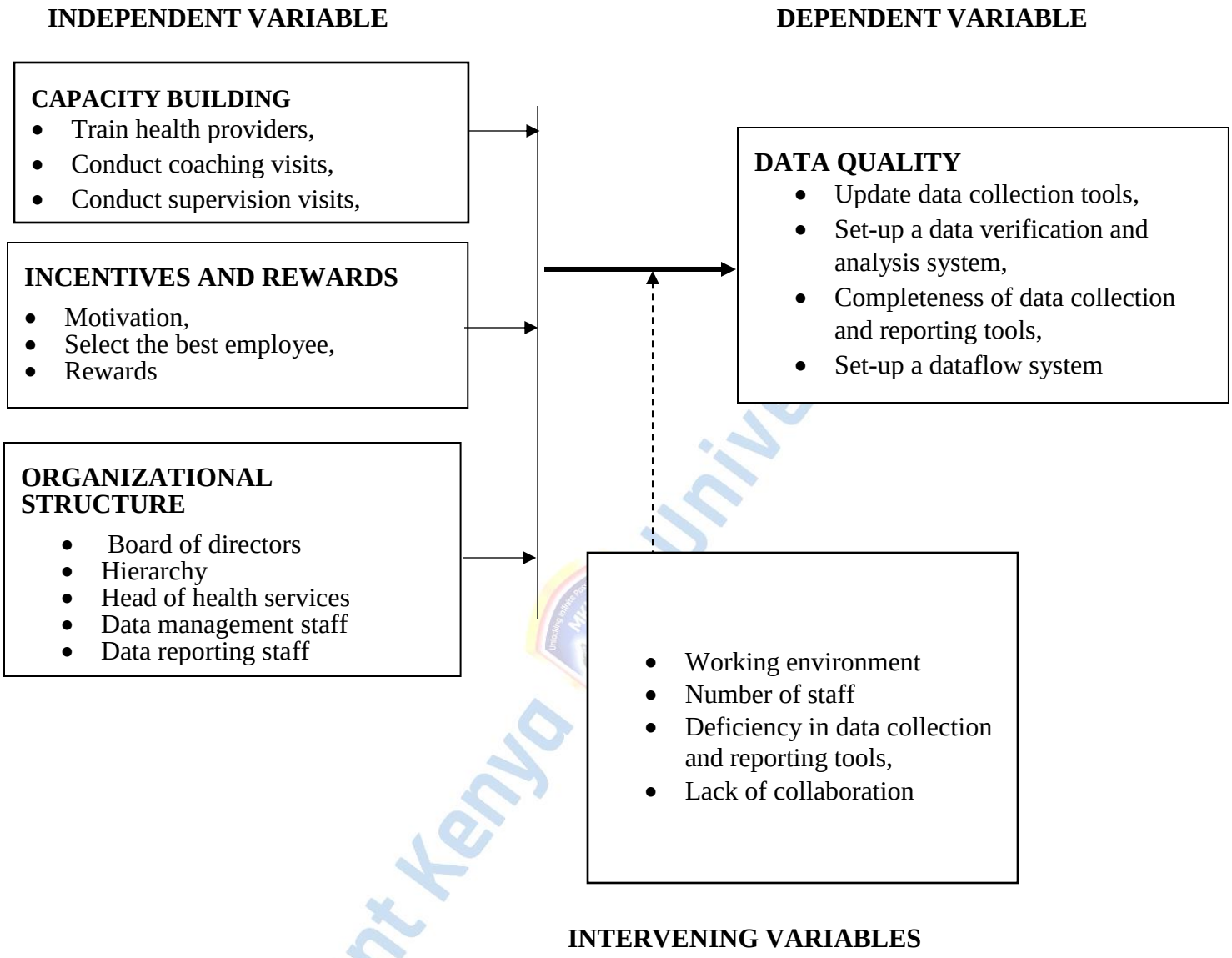
Proper data gathering, administration and optimal application of gathered information will determine the effectiveness of a health program in discernment of health challenges, prioritization as well as allotment of resources to enhance the health benefits. Moreover, Carbone (2009) added that the theory intimated that the healthcare spheres are in the hands of health staff who are also main decision makers and doctors require a motivation to effect the behavioral changes in medical

profession by application of local records when making decisions. According to WHO (2005) there is need to ensure that there is appropriate gathering, administration and application of data with healthcare system in order to enhance effectiveness as well as efficiency in identifying health complications, establishing prime concerns, pinpointing contemporary solutions and allotting resources to ameliorate health end results. Additionally, Carbone argued that health architecture is owned by health medical workers who are also in charge of making key and fundamental decisions hence there is a need to ensure that they are motivated to exert influence on behavioral change in clinical sphere to apply local data for effective decision-making. The theory was adopted for this study since it concurs that there is a need for organizations to apply data as well as routine daily information in planning and making decisions for developmental organizations.

2.5. Conceptual Framework

The conceptual framework enables the researcher to be aware and understand the relation that exists between variables targeted by the research. As far as this study is concerned, the conceptual framework shows the relationship between independents, dependents and intervening variables and their influence on the quality of data in health facilities of Bujumbura-Mairie province. In addition, it conceptualizes that capacity building, incentives, and rewards as well as organizational structure, have an impact on the quality of data and dependent variable that is data quality as shown by the figure below:

Figure 1: Conceptual framework



Source: Researcher 2023

2.6 Research Gaps

Organizations, through implementation of projects, often face challenges regarding the quality of data which may have a negative impact on decision-making. The gap in data quality may be defined by the lack of data quality analysis procedures within organizations.

For this research, HIV data in Burundi health system is a challenge due to their quality. Therefore, in health facilities, the quality of data is affected by the non-existence and usage of standard tools (registers, data collection and reporting forms), lack of knowledge in data management, the lack data flow system, lack of data verification and analysis, organizational structure, law involvement of health district staff, as well as the lack of capacity building or coaching activities targeting health providers.

In the same perspective, it is difficult to apply data to enhance the productivity of an organization in situations where data is not identical. Therefore, as we strive to achieve maximum control of this epidemic in Burundi, the national AIDS control program, and the MOH require data that has elements of completeness, timeliness, as well as accuracy on HIV benchmarks to be able to discover and act on areas that are pertinent in improving the quality of HIV program through quality data.

Reports show that different meeting with HIV program stakeholder were organized under the leadership of the National Health Information System and the National AIDS Program with the purpose of addressing data quality issues that were attributed as hindering efforts towards tracking the performance of HIV care and treatment services supported by the U.S. President's Emergency Plan for AIDS Relief (PEPFAR). As stated by Data-Fi report, it was clear that health providers do

not regularly update health facility records as well as database (DHIS2, standard registers and other tools).

As far as data quality is concerned, HIV stakeholders in close collaboration with the PNLS/IST, have developed and disseminated data quality verification tools but some health facilities were not using those tools. Regarding data reporting, there is a gap in data completeness and accuracy in the DHIS2 compared to the data from NGOs implementing HIV/AIDS projects.

To address those issues, the PNLS thought that a training session on data quality using the data quality review or verification tools for health districts officials and central level (MOH) officials could address the data quality issues. Even though health officials and health providers were trained on data quality, the gap in data quality is still persistent.

According to Maria Korolov (2022), data quality is an important aspect to consider for any organization which uses data for decision-making. Therefore, addressing and mitigating data quality challenges that lead to inaccurate or mislead the analytics results is an approach which contributes to the improvement of data quality. In the same opinion as Maria, health data quality challenges pose a threat to the whole health system of a given country since it has a great impact on decision-making.

Maria Korolov (2022) adds that 77% of 500 information services as well as staff that were involved in data operations concurred that they encountered challenges that related to data quality. Furthermore, 91% indicated that data quality is crucial and lack of it was a huge hindrance to the performance of a given entity.

As far as the quality of data is concerned, the HIV data in health facilities in Bujumbura-Mairie (Burundi) faces the following data quality challenges:

- Missing data: One significant data quality challenge is filling the data in the national database (DHIS2) as some health facilities do not timely record data into the system,
- Inconsistent data: data is collected from multiple services within the health facilities and recorded into DHIS2 by another health provider who did not participate in the data collection process. Even if each service within the health facility may report accurate data, the data clerk may record wrong data (data typing errors),
- Inaccurate data: reported data are most often different from data verified within registers (data source) due to lack of verification process,
- Data Duplication: For example, HIV testing data may be duplicated since when using the lab register in addition to HIV testing registers located in different health services within the health facility, this can be a source of duplication.

2.7. Summary of Literature Review

Chapter two detailed information regarding the literature review and presented the theoretical framework with theories which guided the present study. The main purpose of literature review was to create an understating on independent variables, which are capacity building, organizational structure and, Incentives and Rewards and how each of them influence the data quality in Bujumbura Mairie health facilities. Through a review of previous empirical studies, assessment of conceptual relationships between variables, research gaps along with theoretical framework, conceptual and methodological spheres were identified. To address the identified gaps, a conceptual framework indicating the relationship between variables was described in the literature review.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1. Introduction

This chapter discusses and explains data collection and analysis methods used in this study. In addition, this chapter explains different processes undertaken and thus enables readers to evaluate the reliability and validity of the research.

The present chapter dealt with the explanation of methods that was applied in conducting this study. Through this chapter, the following elements were organized, namely research design, study location, sampling techniques, and procedures, target health facilities, development of the questionnaire, data collection procedures, analysis techniques and ethical considerations.

3.2. Research Methodology

As far as this study is concerned, both qualitative and quantitative data collection methods were used. As a mixed approach, this methodology helped to triangulate data with the aim of complementing each of the method (qualitative and quantitative). Through quantitative data, the study collected information from health providers based on their definite response to broad whereas through qualitative data, the researcher asked specific questions. In both cases, answers from respondents were statistically analyzed and mixed for reporting.

In other words, a mixed method was used to combine quantitative and qualitative data and answer the research questions. It helps to collect more information on the study than a standalone quantitative or qualitative study, as it integrates benefits of both methods. Through this study, the mixed approach is preferred because quantitative or qualitative data alone were not sufficient to answer the research questions.

Using different methods to collect data through this study contributed to making results more credible which leads to validity of the research findings since qualitative and quantitative data are converged using mixed method or triangulation approach.

Data was collected using a questionnaire which contained close-ended and open-ended questions and informants were health providers working in HIV care management services, HMIS staff of targeted health facilities as well as health district and province responsible of Bujumbura-Mairie.

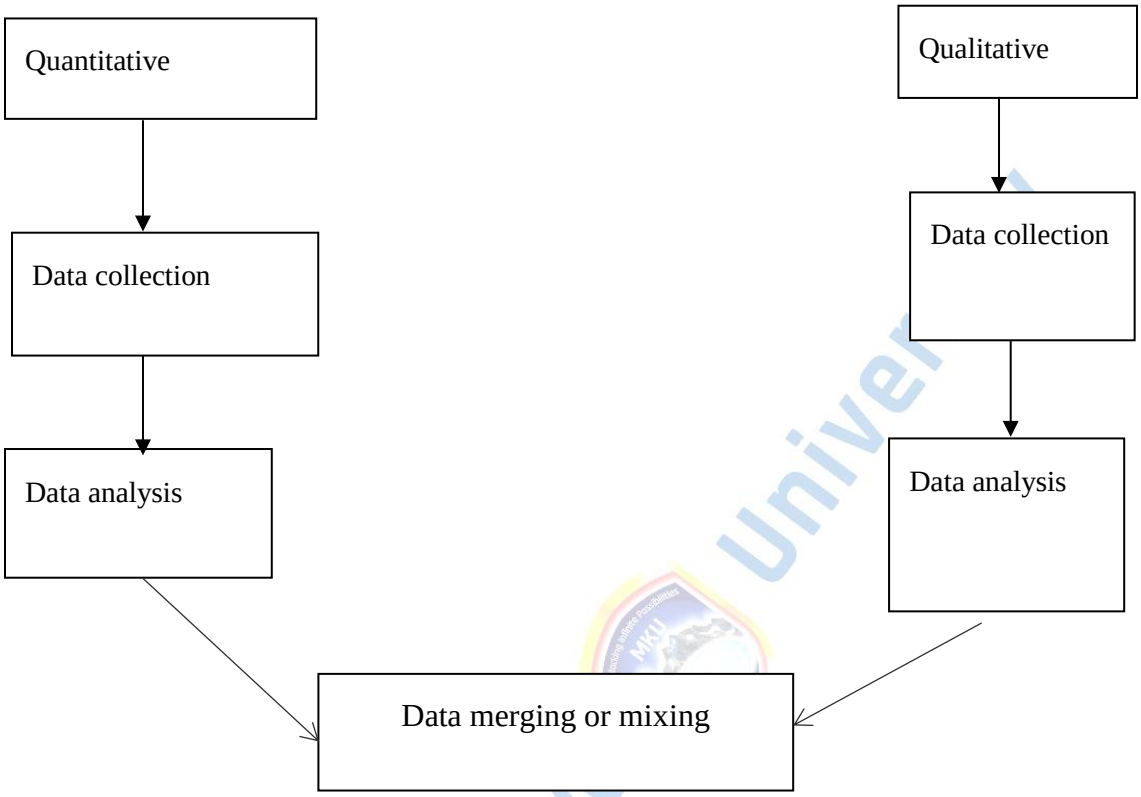
In other words, the research questionnaire helped to collect qualitative and quantitative data on the influence of capacity building, organizational structure, incentives, and rewards on HIV data quality. In addition, the research questionnaire helped to find out whether health facilities have: (i) Updated data collection and reporting tools, (ii) Data verification and analysis system, (iii) Data flow system.

3.3. Research Design

According to Borg, Meredith and Gall (2007) defined research design as a detailed plan for how the research will be conducted. Therefore, research design is a blueprint that is used as a connection between the conceptual research problems with the attainable factual study. It establishes the process gathering the necessary and requisite data, applicable methodologies to gather as well as analyze data, and how collected information answered the research question (Grey, 2014). This study is used descriptive cross- sectional research design using both quantitative as well as qualitative techniques aimed at collecting data.

The figure below shows how the researcher used the mixed method approach and analyze qualitative and quantitative data.

Figure 2: Qualitative and quantitative approach



3.4. Location of the Study

In Bujumbura Mairie health province as the rest of the country, health facilities are categorized as faith-based, public, and private but facilities are governed by the MOH‘s policies. As far as HIV/AIDS care management is concerned, only 66 out of 199 health facilities in Bujumbura Mairie provide comprehensive HIV care to beneficiaries.

To institute efficiency as well as effectives in providing health services, the ministry of health is divided into four segments: a national level, divided into programs and cross-sectoral

administration, a provincial level, a district level, and facility level through the primary health care (PHC) centers. Activities including TB, malaria, and immunization, are conducted as part of an integrated minimum services package at facility level and coordinated by provincial or district offices.

To increase access to healthcare services, since 1984 the Government of Burundi via the Ministry of public health introduced the use of Health Insurance Card (Carte d'Assurance Maladie) at the national level. The health insurance card allows all Burundians to have access to health care in health centers and district hospitals, by paying only 20% of the service received including drugs against 80% paid by the Burundi government. Even though Burundians may have access to healthcare, Burundi's health system suffers from a lack of adequate infrastructure and human resources to meet urgent community health needs.

This study was conducted in Bujumbura Mairie, one of the 18 provinces of Burundi. As far as the health system is concerned, in Burundi, each administrative province is also a health province according to the Ministry of Public health and fight against AIDS denomination. Thus, Bujumbura Mairie province has three health districts, namely Bujumbura Centre, Bujumbura Nord, and Bujumbura Sud. This study targeted health facilities (both public and private) located in those three health districts.

3.5. Target Population

For this study, the target population are health providers working in the HIV care and management service and health management information system (HMIS) within the 66 health facilities offering HIV care and treatment to people living with HIV (PLHIV).

Bujumbura Mairie province has 199 health facilities, of which 66 provide HIV care management service, namely HIV testing, ARV treatment as well as viral load (VL) services to beneficiaries. As far as this study is concerned, two categories of staff within the health facility will be targeted: (i) health providers working in the HIV care management and (ii) health management information system (HMIS) staff. According to stratified sampling technique, the target population for these two categories is as follows:

Table 1: Target Population

Target population	Total	Target	%
Health providers working in HIV care management services in the health facility	200	132	66%
health management information system (HMIS) in health facility	73	62	31%
Total	**273**	**194**	**97%**

Source: Researcher 2024

3.6. Sampling Procedures

To draw the study sample size, stratified random sampling technique was used to make sure each participant had an equal opportunity to participate in the study thereby reducing chances of overrepresentation of individual strata within the population. Kothari (2004) observed that stratified sampling technique provides information that is highly reliable and highly detailed thereby enhancing the findings of the study. As shown in Table 1, the population of the health facilities were grouped in three strata. The list of all the public health facilities that provided HIV care services were listed considering the level of services that they provided and distributed according to the three health districts of Bujumbura Mairie i.e. DS Bujumbura centre, DS Bujumbura nord and DS Bujumbura sud. Simple random sampling technique was applied to deduce a sample that is representative from each of the stratum.

3.7. Sample Size

Bujumbura-Mairie province has 199 health facilities, of which 66 provide a comprehensive HIV care and management to beneficiaries, including people living with HIV (PLHIV). As this study aims to investigate the influence of organizational factors on the quality of HIV/AIDS data management, the study will target the 66 health facilities with HIV and care management services. For each sampled health facility, two categories of respondents will be targeted: (i) health providers working in the HIV care management, and (ii) health management information system (HMIS) staff. To draw the study sample size, stratified random sampling technique will be used to make sure each participant has an equal opportunity to participate in the study. Therefore, the sample size of the study is 194 (132 health providers working in the HIV care management and 62 health management information system (HMIS). This means 194 or more measurements/surveys

are needed to have a confidence level of 95% that the real value is within ±5% of the measured/surveyed value. The sample size was calculated according to the following formula:

$$\text{Sample size} = \frac{\frac{z^2 \times p\,(1-p)}{e^2}}{1 + \left(\frac{z^2 \times p\,(1-p)}{e^2 N}\right)}$$

- N: population size. N = 273
- e: margin error (or confidence interval). e=5%: value commonly considered sufficient.
- z: z-score = 1.96 for the confidence level is 95%, the value commonly considered sufficient.
- p: population proportion. P=50%, the value commonly considered sufficient if we don't know it.

According to the sample size of the study, 194 respondents will be targeted as stated above (132 health providers working in the HIV care management and 62-health management information system (HMIS).

Table 2: Sample Population

Health Facility	Frequency	Percentage
Health Providers working with HIV	132	68
HIV care Management	62	32
Total	**194**	**100**

Source: Researcher 2024

3.8. Research Instruments

This study used both the questionnaire and key informant guide as research tools to collect both qualitative and quantitative data. Questionnaires were used to collect quantitative data including numeric data. Key informant guide was used to collect qualitative data since they provide

comprehensive explanations and opinions. The data collection tool was addressed to health providers working in the HIV care management service and health information staff of the target health facilities as well as health information staff of health districts and health province. In addition, the questionnaire was used for this study because it enables the researcher to collect the needed information within a short period of time as respondents may freely plan on how to fill the questionnaire. According to the informant's availability, the researcher used enumerator to collect data using the kobo collect tool as the questionnaire was installed into this application to facilitate data collection and analysis.

3.8.1. Questionnaire to HIV Care Management Service Health Providers

As far as HIV care management is concerned, at a health facility level there is an HIV care service which routinely manage HIV data as well as HIV services to beneficiaries, especially People Living with HIV (PLHIV). In the HIV service, there is a staff appointed for data collection and reporting. During this study, health providers in charge of HIV data reported have been chosen to participate in this research.

3.8.2. Questionnaire to Health Management Information System Staff

Each health facility in Burundi has a staff in charge of health information system. The latter oversees compiling data reporting forms from different health services within the health facility. After compiling reports, the health information system staff is the only responsible of recording compiled data into the national database DHIS2. This category of staff was also targeted by this study as most of the time the quality of data is affected by recording errors.

3.9. Piloting of Research Instruments

Piloting involves the testing of the questionnaire to selected informants who are a representative of the target research sample and the subsequent use of statistical analysis and feedback to reduce the number of items in the questionnaire into manageable number. In other words, to check the suitability, validity and relevance of the research questions, the pilot testing was conducted to each category of respondents. For this study, 112 respondents were targeted, and the testing phase targeted only 10% (11) of the respondents with a proportional sampling for each category. In addition, this testing helped to ensure that the language used is clearly understood by respondents to avoid any ambiguity. To avoid bias, data collected through pilot phase was not taken into consideration in this study.

3.10. Testing for Validity, Reliability, Dependability, and Credibility.

The term validity helped this document how good a test is for a particular situation whereas reliability will direct how trustworthy a score on that test was. As far as the relationship between reliability and validity is concerned, test validity is requisite to test reliability. In other words, the two terms are interrelated since if the validity is not verified, then the reliability cannot be tested.

For this study, reliability and validity of the data collection tool was tested to make sure the research instrument can enable the researcher to collect the indented information from informants in a clear manner. For the credibility of the collected information, the researcher showed different processes undertaken and methodology used to collect and analysis data.

3.10.1. Testing for Validity

In a research study, validity is the most important factor to be considered in choosing a test. Test validity refers to which feature the test intends to measure and how well the test measures that

feature. Testing the validity enabled the researcher to make sure that the research questionnaire covers all variables of the study. Furthermore, with the support of peer reviewer and supervisor, the researcher analyzed all components of the research questionnaire, to verify if all items, and tools are valid to collect the desired data.

3.10.2. Testing for Reliability

Reliability was used to document how dependably or consistently a test measures a characteristic. In addition, test reliability focuses more on stability and consistency of the outlined items in the research instruments. According to Samuel A. Livingston (2018), the test scores' reliability can be measured to the extent to which the scores are consistent through different period where the test was conducted or while referring to different raters scoring the test taker's responses. Reliability test was carried out using Cronbach alpha coefficient for every independent variable and for an alpha (α) of 0.7 and above was considered to be reliable. Additionally, a coefficient that is less than 0.7 is regarded as weak while coefficient that is 0.8 and above is regarded as appropriate.

3.10.3. Testing for Dependability

Dependability may be defined as the quality of being able to be relied on, worth of trust, or capable of being dependent on. During the study, the level of dependability was verified by the researcher while analyzing the different responses received from informants. In addition, the testing of dependability helped the research ensure the accuracy or consistency of the research findings in relation to collected data.

3.10.4. Testing for Credibility

Credibility is of paramount importance since it links the findings of the study with what really exists (real situation) so that the research findings can be trusted by readers and other audiences. To support the findings, the researcher may use triangulation method for data analysis, documentation or other multiple data sources which may help to navigate the meaning of data across health facilities targeted by the study. Data triangulation approach enabled the researcher to acquire credibility.

In addition, for a source to be credible, the researcher must be able to discern the competence and willingness of the source in telling the truth as well as the adequacy of data relayed by the source.

Therefore, for this study, the credibility helped to link the findings of the study to the reality in terms of data quality of health facilities in Bujumbura Mairie province.

3.11. Data Collection Procedures

To get access to health facilities, the researcher received a letter of introduction from Mount Kenya University (Burundi Campus). The letter was addressed to Bujumbura Mairie province Director who later issued another letter which addressed to the top management of health facilities targeted by the study. In addition, to fully communicate or interact with health providers working in the HIV care management service and HMIS staff, the head of the health facility introduced the researcher to the intended audience.

Once at the health facility, the researcher respected the protocol guidelines of the visited health facility. Before administrating the questionnaire using kobo collect tool, the informants were requested to fill in and sign the consent form.

Note that data was collected through interviews using a questionnaire installed in Kobo collect tool or by administering a questionnaire to health providers and collecting back the filled questionnaire, according to the context.

3.12. Data Analysis Procedures

The purpose of data analysis is to identify trends, patterns, and meaningful insights, with the goal of solving the stated problem. For this study, qualitative and quantitative data was collected using a developed questionnaire. Collected data using Kobo collect or paper-based questionnaire was exported into excel and imported into SPSS for analysis. Excel was used as a database for this study. In addition, data was cleaned as well as analyzed according to the project objectives for interpretation purposes. Data presentation was in align with project objectives as well as variables and descriptive statistics were used. Analysis of qualitative data was analysed through the application of content and narrative analysis. This established the relationship between organizational factors and data quality.

3.13. Ethical Considerations

For this study, the ethical consideration principles included informed consent, anonymity, confidentiality, anonymity, storage of collected data, and Intellectual ownership and plagiarism.

3.13.1. Informed Consent

Before filling out the questionnaire or starting the interview, the informant freely filled in and sign the consent form. In addition, the researcher was asked the informant to feel at ease while responding to questions.

3.13.2. Confidentiality

The research ensured that the information provided by the informants is treated with privacy.

The informant needed to know that the information collected was only used for the only purpose stated in the study and accessed by the researcher only. This helped the researcher to build trust with participants and enable them to provide clear and frank information.

3.13.3. Anonymity

On the data collection tools, no identification of the respondent was filled to keep the anonymity of participants. The researcher only kept the name of the visited health facility.

3.13.4. Storage of Data Collected.

Data collected from health providers (respondents) using questionnaires was analyzed and stored in a confidential manner to avoid any access to unauthorized individuals. As this study used questionnaires as data collection tools, those questionnaires were stored in locked cupboard during and after the data analysis. For data collected using the kobo collect tool, the link was disabled after exporting data into excel.

3.13.5. Intellectual Ownership and Plagiarism

To ensure the research work is free from plagiarism, the thesis was uploaded into Turnitin online program to check for plagiarism and clean. This checking activity was conducted before each submission and presentation.

CHAPTER FOUR: RESEARCH FINDINGS AND DISCUSSION

4.1. Introduction

This chapter dealt with the analysis of the findings of the research based on three objectives of the study and focused on the analysis and interpretation of the results while considering the informant's questionnaire. Note that for this study two categories of informants were concerned, namely HIV care management service staff in charge of data reporting and health information staff of health facilities. Therefore, data analysis and interpretation were presented based on the following two groups: Group A: HIV care management service staff in charge of data reporting and Group B: health management information staff of health facilities.

4.2: Demographic information

4.2.1: Response Rate

The study target populations were 194 (132 health providers and 62 HMIS staff). All informants (194) successfully responded to the questionnaire, which represents 100%. A response rate of 80% and above is regarded excellent since a high response rate is an important aspect of a quality study necessary for producing sound, authentic and generalizable findings for study (Booker, Austin, & Balasubramanian, 2021).

Table 3: Response rate

Response	Frequency	Percentage
Successful	194	100%
Unsuccessful	0	0%
Total	**122**	**100%**

Source: Researcher (2024)

4.2.2: Informants' distribution by Gender

Informant gender information was collected to get an idea of which category of people is dominant in managing data at health facility level. The findings of the study showed that female represented 56% while 44% were male.

Table 4: Gender distribution

Gender	Frequency	Percentage
Female	108	56%
Male	86	44%
Total	**194**	**100%**

Source: Researcher (2024)

4.3. Validity and Reliability Test

4.3.1. Validity Test

According to Kombo & Tromp (2009) validity indicate the accuracy and correctness of a research instrument. It is important to ensure that the questionnaire that was involved in the study is valid so as to obtain information that is relevant, authentic and reliable. Validity therefore means the capacity of a questionnaire to measure what it was supposed to measure (Field, 2005). Validity in this study was achieved by issuing questionnaire to a team of experts in data management as well as my supervisors who provided their opinions and comments on the questionnaire. The experts and the supervisors were supposed to examine for readability, coherence, completeness and if the items would ultimately achieve the objectives of the research. The suggestions that were provided by the supervisor and the experts were analyzed and incorporated in the questionnaires.

4.3.2 Reliability Test

Reliability involves testing the consistency of a research instrument (Huck, 2007). Reliability therefore looks into the degree of dependability of a questionnaire. Sasaka, Namusonge and Sakwa (2014) defined reliability as a test that is carried to determine the capacity or ability of a research instrument to identically provide produce similar answers under similar circumstances and conditions. The pilot test targeted 19 respondents which is about 10% of the targeted population. A general rule of the thumb for Cronbach's Alpha values according to George and Mallery (2011) is "_ > 0.9 – Excellent, _ > 0.8 – Good, _ > 0.7 – Satisfactory, _ > 0.6 – Contentious, _ > 0.5 – Poor, and < 0.5 – Unacceptable". The findings of the reliability tests are represented in table 4. Cronbach Alpha scores of every variable of the study whereby data quality had a score of 0.831, capacity building recorded a score of 0.879, incentives and rewards recorded a score of 0.887 and organizational culture 0.714.

Table 5: Summary of Cronbach's alpha Reliability Coefficient

Variables	Number of Items	Cronbach's Alpha	Remarks
Data Quality	6	0.831	Accepted
Capacity Building	6	0.879	Accepted
Incentives and Rewards	5	0.887	Accepted
Organizational Structure	6	0.714	Accepted

Source: Field survey 2024

4.4. Health information system staff of health facilities

4.4.1. Influence of capacity building on data quality in health facilities.

The researcher wanted to find out to which extend capacity building influences data quality in health facilities. The findings indicated that most of the informants (97%) had knowledge on data

quality as represented in table 6. All the 62 respondents support the statement on whether they need any capacity building on data handling and management. Capacity building process is an important aspect that must be considered when implementing a robust, effective and sustainable health information system (Ahsan, et al., 2017).

Table 6: Capacity Building

Question	Yes	No
Do you have knowledge on data quality?	60 (97%)	2 (3%)
Do you need any capacity building in terms of data quality?	62 (100%)	0

Source: Researcher (2024)

The study also inquired about the source of knowledge on data quality as presented in table *7*.

Table 7: Source of Knowledge about Data.

Source of Knowledge	Frequency	Percentage
Training session or workshop (capacity building)	28	45.2
Coaching and supervision visits of HMIS staff from health district	2	3.2
Through coaching and supervision visits of partners	2	3.2
All the Above	28	45.2
Blank	2	3.2
Total	**62**	**100**

Source: Researcher (2024)

From results, the single source of knowledge is training sessions or workshops, which represented 45.2%. Coaching and supervision visits of HMIS staff from health district, coaching, and supervision visits of partners is represented by a smaller portion of 3.2% each. A combination of the three sources is represented by 45.2%. It is important therefore to acknowledge that coaching and supervision visits of HMIS staff from health district and partners have very minimal contribution in improving the knowledge about data. The importance of capacity building among

staff working in health facilities cannot be ignored as supported by Kikaya, et al. (2024) that capacity building that is high-pitched combined with continous mentorship will enhance data quality and ultimately boost the quality of health care services provided.

i) Perceived value to the capacity building

The researcher wanted to determine whether respondents perceived any value of having knowledge about data or the benefits brought by the capacity building as presented in table 8.

Table 8: Perceived value to the capacity building

Perceived value to the capacity building	Frequency	Percentage
Improve the knowledge regarding the data quality and accuracy	11	18
Develop competences in data triangulation	9	15
Improve the competence in terms of data reporting to minimize errors	8	13
All the Above	34	54
Total	**62**	**100**

Source: Researcher (2024)

From the findings, 18% believed that enhanced capacity building improves the knowledge regarding the data quality and accuracy. Additionally, 15 % of them indicated that capacity building develops competencies in data triangulation while 13% indicated that capacity building improves the competencies in terms of data reporting. Lastly, 54% believed that capacity building has the combination of all the benefits that have been listed.

From the interview guide, respondents concurred that capacity building is a key component in determining quality of data in health facilities providing HIV care services. Capacity building, therefore, assists health workers in improving data collection skills, data analysis and ultimately data interpretation. Additionally, respondents indicated that there is a need for the concerned parties to ensure that there is continuous capacity building to address emerging challenges that is

affecting the sector. As supported by Odhiambo and Iravo (2018), the benefits of capacity building of staff in health facilities is to boosts their performance.

ii) Role of coaching and supportive supervision visits of health district officials in improving value on the quality of data.

The study wanted to determine the role that coaching and supportive supervision visits of health district officials have in raising the quality of data.

Table 9: Role coaching and supportive supervision visits of health district officials in improving value on the quality of data

Benefits of coaching and supportive supervision visits	Frequency	Percentage
It allows to build the capacity of health providers on data quality	36	58
It allows to know much about indicators' definition	5	8
All the Above	21	34
Total	**62**	**100**

Source: Researcher (2024)

As presented in the table 9 above, 58% of the respondents concurred that coaching and supportive supervision visits of health district officials allows the health providers to build their capacity and therefore enhance data quality. Moreover, 8% of the respondents believed that supervision and visits of health district officials allow the health providers to know much about indicators' definition while 34% of the respondents believed all the above benefits.

Coaching and supervision visits by the health district have a big contribution in building and boosting capacity of health providers. Therefore, necessary measures should be put in place to make these visits more effective.

iii) Supervision visits on data quality.

The study wanted to determine where the health providers receive supervision visits on data quality in general and whether these supervision visits are of paramount importance in ensuring data quality as indicated in table 10.

Table 10: Supervision visits

Supervision visits	Frequency	Percentage
Health district province officials in charge of data	21	33
Others stakeholder or partners implementing HIV program	16	26
Joint visits of health province and health district officials and partners implementing HIV program	24	39
Blanks	1	2
Total	**62**	**100**

Source: Researcher (2024)

All the respondents 98% concurred that those supervision visits are of paramount importance in terms of data quality in general. According to results, 33% indicated that they get supervision visits from health district province officials in charge of data, 26% responded that they receive supervision visits from others stakeholder or partners implementing HIV program while 39% of indicated that they receive joint supervision visits.

4.4.2. Influence of organizational structure on health data quality

i) Staff responsible for data recording into DHIS2

The study wanted to determine the number of staff that oversee data recording into DHIS2, and the findings presented in table 11.

Table 11: Staff Sufficiency

Question	Yes	No
Is the number of staff within the HMIS sufficient for the workload of the data recording into DHIS2?	35%	65%

Source: Researcher (2024)

From the results, 87% confirmed that one person is responsible oversee data recording into DHIS2, 11% indicated that two people while 2% indicated 3 and more people are responsible for recording data into DHIS2. Additionally, the findings indicated that 65% felt that the number of staff allocated to record data into DHIS2 is not enough while 35% indicated that is sufficient. Inadequate staff may in many cases compromise the data quality and therefore health facilities should address this anomaly. This view is supported by 94% of the respondent who indicate that the number of staff in the facility health information service has an impact on the quality of data recorded into DHIS2 while 6% felt that it does not have any impact. According to Lubang , Nyongesa and Tobijo , (2024) adequate staffing, capcity building through training and continous training are vital in perpetuitring and sustaining the suitable and relevant capabilities for data quality.

ii) Method of collecting report from the healthy facility services

The study wanted to find out how data are collected at the healthy facility services and results are presented in table 12.

Table 12: Method of Report collecting

Method of Report collecting	Frequency	Percentage
I collect reports from each service	30	48.4%
Each service submits a report to the data management service	15	24.2%
I collect final reports from the responsible of the health facility	17	27.4%
Total	**62**	**100**

Source: Researcher (2024)

From the findings 48.4% of the respondents indicated that they collect reports from each service, 4.21% of the respondents indicated that each service submits a report to the data management service while 27.4% indicated that they collect final reports from the responsible of the health facility. The study indicated that there is collaboration between the health information staff and other staff who oversee data reporting within the health facility in terms of data correction with 87% of respondent while 13% indicated that there is no collaboration. Collaboration between health information staff and data reporting staff is important in ensuring that data quality is maintained.

Iii) Receiver of monthly reports

The study wanted to determine the party receives monthly report prepared by health facilities and the findings represented in table 13.

Table 13: Receiver of the monthly report

Receiver of the monthly report	**Frequency**	**Percentage**
Health District via DHIS2	40	65
Partners implementing HIV program	5	8
Health District via DHIS2 and Partners implementing HIV program	17	27
Total	**62**	**100**

Source: Researcher (2024)

According to table 13, 65% of health facilities submit their monthly reports to health District through DHIS2. Consequently, 27% of the respondents indicated that that they submit their monthly report to health District via DHIS2 and Partners implementing HIV program while 8% of the respondents indicated that they sent their monthly reports to partners implementing HIV program.

iv) Suggestions on how to improve data quality.

The study wanted to obtain suggestions on how health facilities can enhance data quality.

Table 14: Suggestions to data quality

Suggestions	**Frequency**	**Percentage**
Increase the number of staff	26	42
Early avail the monthly and daily report	36	58
Total	**62**	**100**

Source: Researcher (2024)

From the findings 42% of the respondents indicated that to improve data quality, health facilities should increase the number of staff while 58% of the respondents indicated that early submission of the monthly will improve the data quality. Additionally, 48% indicated that to ensure that data recorded into DHIS2 are the same with those shared to all partners; health facilities should use the same data reporting template. Moreover, 47% suggested that health facilities should use DHIS2 as data source for all partners to ensure uniformity while 5% encouraged the initiation of a close collaboration with health information system and health providers in charge of data reporting from different health services.

v) Sharing of data corrections

The researcher wanted to determine if data corrections that are made together with partners are communicated to the health information system staff for correction into DHIS2 and findings presented in table 15.

Table 15: Sharing of Data Corrections

Suggestions	**Frequency**	**Percentage**
Yes	39	63
No	23	37
Total	**62**	**100**

Source: Researcher (2024)

From the findings 63% concurred that data corrections made with partners is communicated to the health information system staff for correction into DHIS2 while 37% were of the contrary opinion.

vi) Main reasons for data Discrepancies

The researcher wanted to examine the main reasons for discrepancies between data recorded in DHIS2 and the data shared with the partners.

Table 16: Main reasons for Data Discrepancies

Reason	**Frequency**	**Percentage**
Recording or typing errors into DHIS2	17	27
Lack of data analysis after recording into DHIS2	16	26
Lack of direct communication between the HIV care service and the Health System Information staff regarding the monthly data correction	8	13
Lack of capacity building of Health Information System staff on data analysis after recording into DHIS2	21	34
Total	**62**	**100**

Source: Researcher (2024)

From the findings, 34% indicated that lack of capacity building of Health Information System staff on data analysis after recording into DHIS2 contributes to data discrepancies, 27% indicated that recording or typing errors, 26% indicated mentioned the lack of proper data analysis after recording into DHIS2 while 13% indicated that lack of direct communication between the HIV care service and the Health System Information staff regarding the monthly data correction contributed to data discrepancies. Inadequate capacity has been identified as the main contributor of data discrepancies and there is therefore the need to enhance the capacity of the employees that are involved in data handling. Enhanced capacity may also address the issue of recording or typing errors into DHIS2 as well as lack of data analysis after recording into DHIS2 which may to a very large extent reduce discrepancies between the data recorded in DHIS2 and the data shared with the partners. Additionally, all the respondents agreed that there is an importance to organize data analysis and validation meetings at health facility level.

In addition, 11% of the respondents intimated that data analysis and validation at the health facility level would assist in tracking data recording errors, 27% intimated that it would provide a window for correction, 21% believed that it would contribute to the ownership of data while 41% believed all the above options would be achieved.

From the interview guide respondents identified organization structure as a key factor in determining the data quality. Therefore, proper data gathering, collation, sharing, storage and recovery of health data rely to a very large extent on the organization structure of the organization. Respondents observed that for an organization to have an effective and efficient data management system that will ensure data quality, there is a need to have a well-designed organizational structure. Respondents identified lack of adequate staff as a key factor that contribute to the errors and discrepancies of data that is shared between different stakeholders that are involved in data

management exercise. Respondents observed that there are higher chances of committing errors when huge workload is placed on the employees. Moreover, data corrections have not been properly shared or communicated to different partners. Respondents therefore suggested that additional employees with necessary skills and competencies should be hired in order to address the issue of workload. Respondents also indicated that there is a need of proper collaboration for different parties that are involved in data handling to ensure that there is a data correction sharing to ensure all partners have the same data.

4.4.3: Influence of incentives and rewards on health data quality

The study wanted to determine the role of incentives and rewards in impacting on health data quality. The results are presented in table 17.

Table 17: Incentives

Statement	**Yes**	**No**
At the workplace, do you often select the best employee each year?	6 (10%)	56 (90%)
Do you love to see that selection happen each year?	52 (84%)	10 (16%)
Does the selection of the best employee have an impact on the performance of the employees?	59 (95%)	3 (5%)

Source: Researcher (2024)

According to results, 90% indicated that health facilities do not select their best employee each year but only 10% of them indicated that their organization select their best employee every year. Additionally, 84% indicated that they would like to see that selection happen each year while 16% of the respondents indicated that they would not like to see the selection happen. On the question on whether the selection of the best employee would have an impact on the performance of the employees, 95% indicated that it would have an impact on the performance while 5 % indicated

that it would not. Moreover, 62% indicated that they would like to be rewarded through promotion while 38% said that they would like to have a salary increase. Incentives and rewards are vital in motivating employees both financial and financial rewards hence organizations should work towards designing and implementing reward schemes (Sakeah, Bawah, Kuwolamo, Anyorikeya, Asuming, & Aborigo, 2023).

This view is supported by Arwa, Nyakundi, & Abuga (2019) who observed that reward and incentive practices that are designed and adopted by an organization has a positive and significant impact on the performance of individual employees as well as the entire organization.

From the interview guide, the respondents identified incentives and rewards as key initiative that can improve the performance of employees as well as the performance of the organization. Respondents were in agreement that incentive and reward systems should be adopted by organizations so as to enhance the quality of data. However, respondents concurred that organizations do not have incentive and reward system and this has in many cases demoralized the staff hence poor performance. Various incentive and rewards systems were identified including salary increment, bonuses as well as promotions. Respondents additionally proposed that in designing an incentive and reward system, organizations should involve all the stakeholders to enhance legitimacy, acceptability and sustainability. Lubang , Nyongesa and Tobijo , (2024) also indicated that staff motivation is key in encouraging employees to improve their performance hence health facilities should put measures of identifying and implementing staff motivation schemes.

4.5. HIV care management services staff

4.5.1. Influence of capacity building on data quality in health facilities

Table 18: Capacity building on data quality statements

Statement	Yes	No
Do you have knowledge on data quality?	132(100%)	-
Do you need any capacity building in terms of data quality?	130 (98%)	2(2%)

Source: Researcher (2024)

From the findings 100 (100%) respondents acknowledged that they have sufficient capacity to ensure data quality. However, 98% of the respondents indicated that they need capacity building while only 2% indicated that they do not require capacity building.

Source of data Knowledge

The study also inquired about the source of knowledge on data quality. The findings were presented in table 19.

Table 19: Source of data knowledge

Source	Yes	%
Training session or workshop (capacity building)	48	36
Through coaching and supervision visits of partners	6	5
Through coaching and supervision visits of health information system staff from health district	8	6
All the above	70	53

Source: Researcher (2024)

From the findings, the single source of knowledge is training sessions or workshops that are represented by 36%. Coaching and supervision visits of HMIS staff from health district and coaching is 6% while from partners is 5%. A combination of the three sources is represented by 53%. It is important therefore to acknowledge that coaching and supervision visits of HMIS staff from health district and partners have very minimal contribution to the knowledge about data and efforts and resources should be put in place so as to enhance the level of knowledge even more.

Value of capacity Building

The study also inquired about the value that is derived from the capacity building and the results are presented in table 20.

Table 20: Importance of capacity building

Value	Yes	%
Improve the knowledge regarding the data quality and accuracy	20	15
Improve the competence in terms of data reporting to minimize errors	47	36
Develop competences in data triangulation	15	11
All the above	50	38

Source: Researcher (2024)

From the findings 15% indicated that capacity building enhances the knowledge on data quality and accuracy, 36% indicated that capacity building boosts the competence in data reporting, 11% concurred that capacity building develops competence in data triangulation while 38% believed that capacity building brings about all the benefits that have been mentioned above. Capacity building is therefore important and vital for the organizations to ensure that measures are put in place to continuously improve the skills of the employees.

4.5.3. Influence of organizational structure on health data quality

The study wanted to determine the influence of organizational structure on health data quality and the findings presnted in table 21.

Table 21: Number of Employees

Number of employees	Yes	%
1-2 Employees	78	59
3-4 Employees	28	21
4 and above	26	20
Total	**132**	**100**

Source: Researcher (2024)

From the findings, 59% of respondents indicated that health facilities had 1-2 employees working in the HIV care management, 21% had 3-4 employees while 20% had 4 and above. From the findings most of respondents 77(58%) indicated that the staff in the HIV care management is not sufficient to handle the workload while 55 (42%) indicated that the number of staff is sufficient. It is imperative therefore for health facilities to hire more staff to effectively and efficiently deal with the workload to improve the data quality as well as service delivery.

Data Reporting Accountability

The study also inquired about the data reporting accountability. The findings were presented in table 22.

Table 22: Data Reporting Accountability

Source	**Yes**	**No**
Are you accountable for report transmission?	132	-
Is there any staff in charge of preparing the monthly report or other reports?	132	-
Is there any data analysis and review system within the health facility or HIV care management service?	110	22
Within the HIV management service, is there any system for monthly report data review before its submission to intended audience?	88	44
Do you think that the data verification system within the HIV care service may reduce data reporting errors?	132	-
Data shared with different partners, are shared using the same data reporting template?	72	60
According to you, the number of staff in the HIV care service has an impact on the quality of data?	126	6
The HIV care service monthly report is shared to all partners by the same staff?	100	32
The HIV care service monthly report shared with partners is it the same as the one recorded in DHIS2?	116	16
Is there any data verification done by the HIV care service for data recorded in DHIS2?	66	66
Data correction made with partners, are they communicated to the HMIS staff for correction into DHIS2?	85	47
If the monthly report from the HIV care service were recorded by the staff from the service, would this reduce data discordance and incoherence between those shared with partners and recorded	126	6

Source: Researcher (2024)

On the statement on whether the respondent is accountable for report transmission, 132 (100%) indicated that indeed they are accountable for report transmission. All the respondents 132 (100%) indicated that there is staff that is in charge of preparing the monthly report or other reports. In addition, 110 (83%) respondents indicated that there is any data analysis and review system within the HIV care management service while 22 (17%) of them were of the contrary view. There is any system for monthly report data review before its submission to intended audience with 67% (88) while 33% (44) of the respondents indicated that no review before submission. Lack of proper review of data before submission may lead to data reporting errors hence compromising on data quality. This view is supported by 100% (132) of the respondents who indicated that data verification system within the HIV care service may reduce data reporting errors. Moreover, 55% concurred data shared with different partners, are shared using the same data reporting template while 45% concurred that different templates were used in sharing reports. According to results, it is important for health facilities to use the same reporting formats so as to reduce confusion and enhance effectiveness.

Majority of the respondents represented by 95% (126) agreed that the number of staff in the HIV care service has an impact on the quality of data. Additionally, 76% of the respondents believed that the HIV care service monthly report is shared to all partners by the same staff while 24% (32) admitted that it is not shared by the same staff. According to results, 88% (116) of informants indicated that they verify data recorded into DHIS2 while 12% (16) believed that there is no data verification done by the HIV care service staff for data recorded in DHIS2. Therefore, it is important to ensure that data verification is enhanced, especially by organizations that are not carrying out the verification. This reduces errors as well as addressing inconsistencies that affect proper utilization of data. Additionally, 64% concurred that data correction made with partners are

communicated to the HMIS staff for correction into DHIS2 while 36% indicated that there is no communication for necessary corrections into DHIS2.

4.5.4: Influence of incentives and rewards on health data quality

The research wanted to find out the impact of incentives and rewards on health data quality. The findings are presented in table 23.

Table 23: Incentives and rewards

Statement	**Yes**	**No**
At the workplace, do you often select the best employee each year?	20 (15%)	112 (85%)
Do you love to see that selection happen each year?	124 (94%)	8 (6%)
Does the selection of the best employee have an impact on his/her performance?	124 (94%)	8 (6%)

Source: Researcher (2024)

According to results, 85% said that organizations do not select their best employee each year while 15% among them indicated that their organizations select the best employee every year. Additionally, 94% indicated that they would like to see that selection happen each year while 6% indicated that they would not like to see the selection happen. On the question on whether the selection of the best employee would have an impact on the performance of the employees, 94% indicated that the selection would have an impact on the performance while 6% of them indicated that it would not have any impact on the employee's performance. Majority of the respondents represented by 63% indicated that they would like to be rewarded through new position (career development) while 37% indicated that they would prefer a salary increment.

4.8: Correlation Analysis

The correlation analysis was carried out to examine if there is an existing association between variables as well as determining the degree of that nexus using Pearson correlation coefficient. Pearson correlation was applied in determining the strength and the direction of the relationship and findings represented in table 24.

Table 24: Pearson Moment Correlation Matrix

Variables	Test	Data Quality	Capacity building	Organizational structure	Incentives and rewards
Data Quality	Pearson Correlation	1			
	Sig. (2-tailed)			.	
Capacity building	Pearson Correlation	0.833**	1	.	
	Sig. (2-tailed)	.000	.000	.	
Organizational structure	Pearson Correlation	.603**	.478**	1	
	Sig. (2-tailed)	.000	.000	.000	
Incentives and rewards	Pearson Correlation	777**	424**	692**	1
	Sig. (2-tailed	.000	.000	.000	.000
N		66	66	66	66

In determining the existing of linear association between exploratory and predictor variable, the study used Pearson correlation coefficient. Correlation analysis determine linear relationships hence checking if the variable used in the study are correlated. When the correlation value is higher, then the correlation of the variable in the study are deemed to be strong. When the positive (+) is determined between independent and dependent variables, then an increase of one variable will lead to an increase of the other variable. When a negative (-) correlation coefficient is

determined, then an increase in one variable will lead to a decrease of the other variable. Zero correlation coefficient implies that there is no correlation between the variables.

The correlation analysis was carried out to determine the association between data quality with capacity building, organizational structure and incentive and rewards system. The analysis indicated that there is a robust correlation between data quality and capacity building in health facilities of Bujumbura Mairie province, Burundi (r=0.833, p=0.000), incentives and rewards was also determined to have a robust as well as positive relationship with data quality (r=0.777, p=0.000). Organizational structure was found to have a strong and positive relationship with health data quality of (r=0.603, p=0.000). In conclusion, the study found out that the variables of the study such as capacity building, organizational structure and incentives and rewards have a strong and positive relationship with the health data quality.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1: Introduction

This chapter presents a detailed discussion of summary of findings, conclusions and recommendations that the study has proposed considering the objectives of the study. A comprehensive discussion of the findings that were obtained in chapter four will be provided. Additionally, suggestions and proposal will be made for the subsequent studies that may be carried out by different scholars that are related and connected to the topic of the study.

5.2: Summary of the findings

5.2.1: Influence of capacity building on data quality in health facilities

The researcher wanted to know the degree and the extent to which capacity building influences the quality of HIV/AIDS data in health facilities of Bujumbura Mairie Province. The findings indicted that most of the informants indicated that they believed that capacity building is important in enhancing data quality in health facilities. This view is supported by the fact that 99% of the respondents had knowledge on data. Additionally, all the respondents represented by 98% concurred that they needed capacity building on data handling and management so as to enhance their data handling skills. To underscore the need for capacity building, 39% identified trainings and workshops as the main single most source of capacity building, 5% indicated coaching and supervision visits of HMIS staff from health district while 4% coaching and supervision visits of partners and 51% indicated the enhance their capacity though combination of all the methods that have been indicated by the study and 1% who did not explain why.

The study determined that capacity building had various benefits including improving the knowledge regarding the data accuracy and quality that is represented by 16%, developing

competencies in data triangulation that is represented by 12%, improving data reporting and minimizing errors represented by 28% while 44% of the respondents indicated that capacity building brings about all the benefits that have been listed. Respondents identified supervision visits as an important component necessary for data quality. From the results 25% indicated that they get supervision visits from health district province officials in charge of data, 41% of them indicated that they receive supervision visits from others stakeholder or partners implementing HIV program and 34% of them indicated that they receive supervision visits from joint visits of health province and health district officials and partners implementing HIV program.

5.2.2: Influence of organizational structure on data quality

The researcher wanted to degree and the extent to which organizational structure influences health data quality of HIV/AIDS data management in health facilities of Bujumbura Mairie Province, Burundi. The study identified organizational structure as a key factor in ensuring data quality. Adequate employees are crucial in ensuring data quality. However, 65% indicated that health information system staff within the health facility is insufficient to handle the workload of recording data into DHIS2 while 35% of them said that it is sufficient. In addition, 94% of informants indicated that having adequate staff to handle data recording in the health facility is key in ensuring that data recorded into DHIS2 does not have errors while 6% of felt that number of staff does not have any impact on the quality of data recorded into DHIS2. Respondents identified various ways in which health facilities should do to improve data quality. 42% of the respondents proposed that health facilities should hire more staff while 58% of the respondents suggested early submission of the monthly and daily reports.

5.2.3: Influence of incentives and rewards on health data quality

With this variable, the researcher wanted to find out to which extent incentives and rewards influence the quality of HIV/AIDS data in health facilities. The study showed that incentives and reward system is important in enhancing the performance of employees as well as the whole organization. This view is supported by 94% of the respondents who indicated that reward and incentive system would have an impact on the employee's performance while 6% of them had a contrary opinion. Nevertheless, 87% of informants indicated that health facilities do not select best employee each while 13% of them said that their organizations select the best employee every year. Moreover, majority of the respondents (91%) indicated that they would like to see a reward and incentive program being implemented by their organizations while 9% of the respondents indicated that they would not like to see the selection of best employee happen in their organization. 63% of the respondents indicated that they would like to be rewarded through promotion while 37% of the respondents indicated that they would like to have a salary increment.

5.3: Conclusion

The study examined the influence of organizational factors on data quality: a case of HIV and AIDS data management in health facilities of Bujumbura Mairie Province, Burundi. The findings from the study indicate that organizational factors including capacity building, organizational structure and incentives and rewards have an impact on data quality. The culmination of the correlation analysis between the dependent and independent variables revealed a strong correlation between capacity building (r=0.833, p=0.000), incentives and rewards (r=0.777 and organizational structure (r=0.603, p=0.000). This correlation analysis indicates that there is a strong association between the independent variables and dependent variables. Health facilities should therefore work on strengthening their organizational structure, incentive and rewards system and capacity building

systems to enhance data quality. These findings underscore the need of concerned organizations to design and implement robust as well as adequate policies that are aimed at enhancing HIV/AIDS data quality. This is because quality data is important in ensuring that decisions made by organizations are objective.

5.4: Recommendations and Contributions of the Study

The following recommendations were formulated:

- Coaching and supervision visits of HMIS staff from health district and partners should be enhanced to build the capacity of employees involved in data handling and management.
- Capacity building has also been identified as a key factor in ensuring health data quality. Therefore, organizations should ensure that employees involved in data handling are continuously being trained on new and essential skills on data handling.
- Adequate employees with necessary skills should be hired to ensure that the workload is reduced.
- Organizations to introduce the incentive and reward programs. It is important to note that for these programs to be effective, employees should be fully involved and their suggestions and feedback should be incorporated t for sustainability reasons.

5.5: Suggestions for further research

The study recommends the scope to be scaled up to all the provinces of Burundi. A further study utilizing other measures of quality is also recommended. This study should delve into evaluating the quality of HIV/AIDs data recorded into DHIS2, evaluating the gaps that exist in data management, establishing classic examples, point of reference as well as useful takeaways for communication and propagation.

REFERENCES

Abdul Fatah, Y. S. (Januari 2019). THE EFFECT OF EMPLOYEE INCENTIVES AND REWARDS ON EMPLOYEE PERFORMANCE. *e-Jurnal Apresiasi Ekonomi Volume 7, Nomor 1*, 46 - 55 .

AbouZahr, C., & Boerma, T. (2005). Health information systems: the foundations of public health. *Bull World Health Organ*, 578–583.

Adrien, R. (2013). Verificaion of Performace in Result-Based Financing: The case of Burundi.

Ahmand Farrukh and Nazir. (2015). Capacity building boost employees performance", Industrial and Commercial Training, Vol. 47 No. 2, pp. 61-66. https://doi.org/10.1108/ICT-05-2014-0036.

Ahsan, K., Tahsina, T., Iqbal, A., Ali, N., Chowdhury, S., Huda, T., et al. (2017). Production and use of estimates for monitoring progress in the health sector: The case of Bangladesh. *Global Health Action*, 10 (vol 1).

Alfandi, A. M. (April 2014). The Role of the Incentives and Reward System in Enhancing Employee's Performance â A Case of Jordanian Travel and Tourism Institutions". *International Journal of Academic Research in Business and Social Sciences* , 326-346.

Arai, D. K. (2021). International Journal of Advanced Computer Science and Applications. *The Science and Information Organization*.

Aron O'Cass, M. W. (2018). Contemporary Issues and Critical Challenges on Innovation in Services. *Journal of Product Innovation Management*.

Arwa, M. R., Nyakundi, W. A., & Abuga, V. M. (2019). Effects of reward systems on performance of the health organizations in Kenya: a case study of Aga Khan Hospital - Kisumu. *International Journal of Social Sciences and Information Technology*, 1-17.

Asemahagn , M. (2017). Determinants of routine health information utilization at primary healthcare facilities in Western Amhara, Ethiopia.

Asiedu, A., Haws, R. A., Mohammed, W., & Doe, J. B. (2024). Coaching visits and supportive supervision for primary care facilities to improve malaria service data quality in Ghana: an intervention case study. 1-32.

Better, S. B. (2018). Evaluating Gaps in Your Data Management Processes and Technology. *BUSINESS INTELLIGENCE, EXPERTISE, IT, SOLUTIONS*.

Bill and Melinda Gates Foundation . (2015). Operations Research on Improving Paper-based Information Systems for Child Health : Request for Application. .

Bisgaard, S. (2007). Quality management and Juran's legacy. *WILEY online library*.

Bowling, A. (2005). Mode of questionnaire administration can have serious effects on data quality. *Journal of Public Health*, 281-291.

Carbone , D. (2009). An Evidence-Based Health Information System Theory. In Health Information Systems: Concepts, Methodologies, Tools, and Applications. 1994- 2011.

Cheburet, S. K., & Otieno, G. O. (2016). Process factors influencing data quality of routine health management information system: Case of Uasin Gishu County referral Hospital, Kenya . *International Research Journal of Public and Environmental Health* , Vol.3 (6) 132-139.

Chiba, Y., Oguttu, M., & Nakayama, T. (2012). Quantitative and qualitative verification of data quality in the childbirth registers of two rural district hospitals in Western Kenya. *Midwifery*, 329–339.

Citeseer. (2009). Data quality issues for accounting information systems' implementation: Systems, stakeholders, and organizational factors . *ournal of Technology Research*.

Colin Phelan and Julie Wren. (2005-2006). UNI Office of Academic Assessment.

Cozby, P. (2001). Mearument Concepts, Methods in Behavioral Research (7th ed.).

Cronbach, L. J. (1971). Response Sets and Test Validity. *Sage Journals*.

David Ronka, R. G. (June 2010). *A PRACTICAL FRAMEWORK FOR BUILDING A DATA-DRIVEN DISTRICT OR SCHOOL: HOW A FOCUS ON DATA QUALITY, CAPACITY, AND CULTURE SUPPORTS DATA-DRIVEN ACTION TO IMPROVE STUDENT OUTCOMES.* Boston: A PCG Education White Paper.

Donaldson, L. (2001). *International Encyclopedia of the Social and Behavioral Sciences*.

Donaldson, L. (2015). International Encyclopedia of the Social and Behavior Sciences (Second Edition).

Donaldson, M. S. (1999). *Measuring the Quality of Health Care.* Washington, D.C: The National Roundtable on Health Care Quality.

DQA. (2019). Data Quality Assessment for HIV Program indicators in Burundi .

Enemark, S. (2006). *Capacity Building for Institutional Development in Surveying and Land Management.* Accra, Ghana: International Federation of Surveyors.

Franco, S. B. (2009). Total Quality Management and Business Excelence. *Taylor & Francis Online*, Vol 20.

Gaba, John Joseph and Vibha. (2017). Organizational Structure, Information Processing, and Decision-Making: A Retrospective and Road Map for Research. *Academy of Management*, Vol. 14, No. 1.

Gimbel, S., Mwanza, M., Nisingizwe, M., Michel, C., & Hirschhorn, L. (2017). Improving data quality across 3 sub-Saharan African countries using the Consolidated Framework for Implementation Research (CFIR): results from the African Health Initiative. *BMC Health Services Research volume* .

Giri Kumar Tayi and Donald P. Ballou, Guest Editors. (1998). Examining Data Quality. *COMMUNICATIONS OF THE ACM*.

Groot, R. (1997). Spatial data infrastructure (SDI) for sustainable land management. *ITCJournal* .

Guy Stecklov, Alexander Weinreb and Calogero Carletto. (2017). Can incentives improve survey data quality in developing countries?: results from a field experiment in India. *Royal Stastical Society*.

Hansen, R. A. (1980). A Self-Perception of the Effect of Monetary and Non-Monetary Incentives on Mail Survey Respondent Behavior. *Journal ofMarketing Research 17*, 77-83.

https://journals.sagepub.com/doi/full/10.1177/2158244019859957#:~:text=Research%20Problem&text=Capacity%20building%20is%20a%20systematic,revenue%2C%20competitiveness%2C%20and%20performance. (n.d.).

https://www.investopedia.com/terms/t/total-quality-management-tqm.asp. (n.d.).

Isaac Nyarko Adu, Antonia Bernadette Donkor Nee Appiah and George Clifford Yamson. (2016). Assessing the Impact of Capacity Building Initiatives on the Service Quality ofLibrary

Professionals in selected private Universities in Ghana. *Journal of Resources Development and Management*, 71-72.

Jasmine Tata, S. P. (1999). The Influence Of Organizational Structure On The Effectiveness Of TQM Programs. *Journal of Managerial Issues*, 440-453.

Javed, R. M. (2021). THE IMPACT OF REWARDS AND COMPENSATION ON EMPLOYEES' PERFORMANCE. *PAL ARCH*, Vol. 18. No. 14.

Juran, J. (1989). *Juran on Leadership for Quality: An executive handbook.* USA: Free Press.

Juran, J. M. (1998). *JURAN'S QUALITY HANDBOOK.* New York: McGraw-Hill.

Juran, J. M. (1998). *THE QUALITY IMPROVEMENT PROCESS.* New York: MC. Graw-Hill.

KA Kerr, T. N. (2008). The strategic management of data quality in healthcare. *Health Informatics Journal*.

Kaine, J. S. (2016). *Performance and Reward Basics.* Camnbridge: Cambridge University Press.

Karas, L. B. (n.d.). Literature Review. *https://uscupstate.libguides.com/Literature_Review*.

Kenyenga , B. O. (2022). Data Quality in Health Management Information Systems in Kenyatta National Hospital, Nairobi City County, Kenya.

Leendertse, B. d. (2020). Building Adaptive Capacity through Learning in Project-Oriented Organisations in Infrastructure Planning. *Open Access Journal*.

Li Cai, and Yangyong Zhu. (2015). The Challenges of Data Quality and Data Quality Assessment in the Big Data Era. *Data Science Journal*.

Lisanne Brown, A. L. (March 2001). *MEASURING CAPACITY BUILDING.* Carolina : MEASURE Evaluation.

Livingston, S. (2018). Test reliability-Basic concepts.

Livingston, S. A. (2018). Educational Testing Service.

Lubang , M. D., Nyongesa, M. W., & Tobijo , S. D. (2024). Factors influencing data quality in routine health information systems in Maridi county,South Sudan. *South African Journal of Information Management*, 1-13.

Michael Imhoff, A. W. (2001). Health informatics. *ESICM Statement*, 179–186.

MichaelJ. Shaw, T. B. (2010). The Use of Monetary Incentives in a Community Survey: Impact on Response Rates, Data Quality, and Cost. *HSR: Health Services Research*.

Moskal, B.M and Leydens, J.A. (2000). Scoring rubric development: Validity and Reliability.

MUKHERJEE, P. (2006). *Total Quality Management.* New Dheli: Prentice Hall of India.

Nachiappan Nagappan, B. M. (January 2008). The Influence of Organizational Structure On Software Quality: An Empirical Case Study. *MSR-TR-2008-11*.

Njoka , P. M. (2015). Factors Influencing Utilization of Routine Health Data in Evidence Based Decision Making in HIV/Aids Services by Public Health Facilities in Nakuru County.

Nkhoma, D., & Kondwani , G. (2021). Investigation of Key Factors Affecting Quality of Patient Data from National Antiretroviral Therapy Electronic Medical Record System in Malawi. *Malawi Journal of Science and Technology*, 25-44.

PEPFAR. (2023). PEPFAR 2023 Country and Regional Operational Plan (COP/ROP) Guidance for all PEPFAR-Supported Countries.

Rodolphe Devillers and Robert Jeansoulin. (2006). Fundamentals of Spatial Data Quality. In R. D. Jeansoulin, *Fundamentals of Spatial Data Quality.* Great Britain and the United States: ISTE Ltd.

Sakeah, E., Bawah, A. A., Kuwolamo, I., Anyorikeya, M., Asuming, P. O., & Aborigo, R. A. (2023). How different incentives influence reported motivation and perceptions of performance in Ghanaian community-based health planning and services zones. *Sakeah et al. BMC Research Notes*, 1-11.

Salant, P. a. (1994). *How to Conduct Your Own Survey.* New York: Wiley.

Sandelowski, M. (2000). *Focus on Research Methods: Combining Qualitative and Quantitative Sampling, Data Collection, and Analysis Techniques in Mixed-Method Studies.* USA: University of North Carolina at Chapel Hill, School of Nursing,.

Sanga , L. J. (2015). Assessment of health management information system (HMIS) performance in health facilities in Mbarali, Kyela and Busokelo district councils. .

SANJAY L. AHIRE, R. L. (1995). TOTAL QUALITY MANAGEMENT: A LITERATURE REVIEW AND AN AGENDA FOR FUTURE RESEARCH. *Production and Operations Management*.

success, A. e. (2011). An empirical investigation of factors influencing data quality improvement success. *AIS Electronic Library (AISeL)*.

Talib, F. R. (2010). The relationship between total quality management and quality performance in the service industry: a theoretical model. *International Journal of Business, Management and Social Sciences (IJBMSS), MultiCraft, Vol. 1, No. 1, pp. 113-128*.

TB, L. (2018). Research Methodology. *University of South Africa*.

TB, L. (2018). *Research Methodology.* South Africa: University of South Africa.

Teaching, T. C. (n.d.). How to improve test reliability and validity: Implication for grading.

testing, S. f. (n.d.). American Educational Research Association, American Phychological Association and National Council on Measurement in Education.

The next frontier in data analytics. (n.d.). *Journal of Accountancy*.

Thornton, G. W. (2001). *Processing of data discrepancies for U.S. dairy cattle and effect on genetic evaluations* . Beltsville, Maryland, USA : Department of Agriculture .

Tilahun, B., Derseh, L., Atinafu, A., Mamuye, A., Mariam, T., Mohammed, M., et al. (2021). Level and contributing factors of health data quality and information use in two districts in Northwest Ethiopia: social-ecological perspective. *BMC Medical Informatics and Decision Making*, 1-15.

Veregin, H. (1999). *Geographical information systems.*

Wang, J., Liu, Y., Li, P., Lin, Z., Sindakis, S., & Aggarwal, S. (2023). Overview of Data Quality: Examining the Dimensions, Antecedents, and Impacts of Data Quality. *Journal of the Knowledge Economy*, 1159–1178.

What is Descriptive Survey Design-Voxco. (n.d.).

WHO. (2015).

WHO. (2015). Tracking Universal Health Coverage: First Global Monitoring Report. World Health Organization. .

WHO. (2019). Data Quality Review.

Williamson, S. E. (2004). CAPACITY BUILDING IN LAND ADMINISTRATION – A CONCEPTUAL APPROACH. *Survey Review*, 639-650.

World Health Organization. (2020). *Overview of the Data Quality Review (DQR) Framework and Methodology*. https://www.who.int/healthinfo/tools_data_analysis/en/: World Health Organization.

Yamoah & Maiyo. (2013). Impact of Capacity Building and Managerial Support on Employees' Performance: The Moderating Role of Employees' Retention.

Yan Liu, A. Z. (2017). An Evaluation of the Capacity-building Effects of Participatory GIS (PGIS) for Public Participation in Land Use Planning. *Taylor & Francis Online*, Volume 32.

Yu, J. a. (1983). A Quantitative Review of Research Design Effects on Response Rates to Questionnaires. *Journal ofMarketing Research 20*, 36-44.

Zamanian, J. A. (2015). International Encyclopedia of the Social &Behavioral Sciences (Second Edition).

APPENDICES

Appendix 1: Letter of introduction

My name is Rukundo Stanislas. I am currently studying a master's degree in Monitoring and Evaluation at Mount Kenya University. I am conducting a research study on "Influence of organizational factors on data quality: a case of HIV and AIDS data management in health facilities of Bujumbura-Mairie province, Burundi**"**. I kindly request your support and assistance by providing frank responses to the research questions.

Note that the information provided will be treated in a confidential way and used with the only purpose of this study.

Appendix 2: Informed consent

INFLUENCE OF ORGANIZATIONAL FACTORS ON DATA QUALITY: A CASE OF HIV AND AIDS DATA MANAGEMENT IN HEALTH FACILITIES OF BUJUMBURA MAIRIE PROVINCE, BURUNDI

Dear Participant,

I invite you to participate in a research study entitled **INFLUENCE OF ORGANIZATIONAL FACTORS ON DATA QUALITY: A CASE OF HIV AND AIDS DATA MANAGEMENT IN HEALTH FACILITIES OF BUJUMBURA MAIRIE PROVINCE, BURUNDI.** I am a student at Mount Kenya University and in the process of writing my master's project. The aim of the study is to investigate the influence of organizational factors on data quality.

The attached questionnaire was designed to collect information on the topic of this research. Your participation is voluntary, and you are free to decline. Your answers will remain confidential and anonymous. Data from this research will be kept under lock and no one will know your individual answers to this questionnaire. There are no direct benefits to you for participating in this research.

If you agree to participate in this project, please answer the questions on the questionnaire as best you can. Please return the questionnaire as soon as possible to enable me to complete the project report.

If you have any questions about this project, feel free to contact the Investigator: Stanislas Rukundo, telephone No. +25779902351 (call and whatsapp).

Thank you for your assistance in this important endeavor.

CONSENT

I have read and I understand the provided information. I clearly understand that my participation is voluntary and that I am free to decline at any time, without giving a reason and without cost. I understand that I will be given a copy of this consent form. I voluntarily agree to take part in this study.

Participant's signature _____ Date _____

Investigator's signature _____ Date _____

Appendix 3: Data collection Tools

I. HIV care management service staff

1. Influence of capacity building on data quality in health facilities

Question 1: Do you have knowledge on data quality? Yes ☐ No ☐

If yes, explain how you got knowledge on data quality by ticking one possible answer below:

a. Training session or workshop (capacity building) ☐
b. Through coaching and supervision visits of partners ☐
c. Through coaching and supervision visits of health information system staff from health district☐
d. All above ☐

Question 2: Do you need any capacity building in terms of data quality? Yes ☐ No ☐

Question 3. Is there any added value to the capacity building?

a. Improve the knowledge regarding the data quality and accuracy☐
b. Improve the competence in terms of data reporting to minimize errors ☐
c. Develop compétences in data triangulation ☐
d. All above ☐

Question 4: To improve the data quality, in which extent/context does the coaching and supportive supervision visits of health district officials have an added value on the quality of data?

a. It allows to build the capacity of health providers on data quality ☐
b. It allows to know much about indicators' definition ☐

c. It is a kind of training for new staff within the HIV care management service☐

d. All above ☐

Question 5: Do you often receive supervision visits on data quality improvement of:

a. Health province and district officials in charge of data ☐

b. Others stakeholder or partners implementing HIV program ☐

c. DSNIS staff ☐

d. Health province and district officials in charge of data and HIV program partner ☐

e. All above ☐

Question 6: Those supervision visits are of paramount importance in terms of data quality in general and, especially HIV data? Yes ☐ No ☐

2. Influence of organizational structure on health data quality

Question 1: How many staff work in the HIV care management within the health facility?

a. 1-2 ☐

b. 3-4 ☐

c. 4 and more ☐

Question 2: Is the number of staff within the service sufficient for the workload of the HIV management service? Yes ☐ No ☐

Question 3: Are you accountable for report transmission? Yes ☐ No ☐, if yes, which ones?

a. Monthly report ☐

b. Weekly report ☐

c. Daily report ☐

d. DHIS2 on monthly basis ☐

e. All above ☐

Question 4: Within the service, is there any staff in charge of preparing the monthly report or other reports? Yes ☐ No ☐

Question 5: What is the source of data filled in the monthly report?

a. HIV registers ☐

b. Sida-info web ☐

c. Open Clinic ☐

d. Different stock forms ☐

e. DHIS2 national ☐

f. HIV registers, SIDA-Info and different stock forms ☐

Question 6: As the monthly report data are from different services within the health facility, data from those services are collected in registers by the staff of the HIV care management service? Yes ☐ No ☐?

Question 7: Is there any data analysis and review system within the health facility or HIV care management service? Yes ☐ No

Question 8: Within the HIV management service, is there any system for monthly report data review before its submission to intended audience? Yes ☐ No ☐

Question 9: Do you think that the data verification system within the HIV care service may reduce data reporting errors? Yes ☐ No ☐

Question 10: To whom the monthly report is transmitted or submitted to?

1. Health District via DHIS2 ☐
2. HIV program partners ☐
3. Partners implementing HIV program ☐

Question 11: Data shared with different partners, are shared using the same data reporting template? Yes ☐ No ☐

Question 12: According to you, the number of staff in the HIV care service has an impact on the quality of data? Yes ☐No ☐

Question 13: To improve the quality of data, what are your suggestions regarding the organization structure of the HIV care and management service work?

a. Sharing tasks within the HIV care service ☐
b. Self-verification of reported data ☐
c. Completeness of the different data sources ☐
d. Data Triangulation ☐
e. Organize data analysis meetings ☐
f. All above ☐

Question 14: What is the main activity of the responsible HIV care service?

a. Coordinate the HIV care management service activities ☐

b. Respond to any request from health district and partners ☐

c. Represent the HIV care service in different meetings? ☐

d. Coordinate the HIV care management service activities and Respond to any request from health district and partners ☐

e. All above ☐

Question 15: The HIV care service monthly report is shared to all partners by the same staff? Yes ☐ No ☐

Question 16: The HIV care service monthly report shared with partners is it the same as the one recorded in DHIS2? Yes ☐ No ☐

Question 17: Who recorded the HIV data in DHIS2?

a. Health Information System staff ☐

b. Health provider from the HIV care service ☐

Question 18: Is there any data verification done by the HIV care service for data recorded in DHIS2? Yes ☐ No ☐

Question 19: Data correction made with partners, are they communicated to the HMIS staff for correction into DHIS2? Yes ☐ No ☐

Question 20: If the monthly report from the HIV care service were recorded by the staff from the service, would this reduce data discordance and incoherence between those shared with partners and recorded into DHIS2? Yes ☐ No ☐

Question 21: According to your understanding, what are the main reasons for the discrepancies between data recorded in DHIS2 to those shared with partners?

a. Recording or typing errors into DHIS2 ☐
b. Lack of data analysis after recording into DHIS2 ☐
c. Lack of direct communication between the HIV care service and the Health System Information staff regarding the monthly data correction ☐
d. Lack of capacity building of HMIS staff of health facilities on data analysis after recording into DHIS2 ☐

Question 22: Is there any importance in organizing data analysis and validation meetings?

Yes ☐ or No, If yes what I the added value?

a. Track data recording errors ☐
b. Window for correction ☐
c. Ownership of data ☐
d. Track data recording errors and Ownership of data ☐
e. All above ☐

Question 24: Do you often receive supportive supervision visits of health district HMIS on data verification and analysis? Yes ☐ or No

3. Influence of incentives and rewards on health data quality

Question 1: At the workplace, do you often select the best employee each year? Yes ☐ No ☐

Question 2: Do you love to see that selection happen each year? Yes ☐ No ☐?

Question 3: The selection of the best employee does it have an impact on the performance of the employees? Yes ☐ No ☐ If yes, why?

a. Motivate employee ☐

b. Improve employee's performance ☐

Question 4: If no on question 3, do you prefer to initiate this kind of practice within the HIV care management services?

Yes ☐ or No ☐

Question 5: How do you wish to be rewarded?

a. New position (Career development) ☐

b. Salary increase. ☐

II. Health information staff of health facilities

1. Influence of capacity building on data quality in health facilities

Question 1: Do you have knowledge on data quality? Yes ☐ No ☐

If yes, explain how you got knowledge on data quality by ticking possible answers below:

a. Training session or workshop (capacity building) ☐

b. Through coaching and supervision visits of partners ☐

c. Through coaching and supervision visits of HMIS staff from health district☐

d. All above ☐

Question 2: Do you need any capacity building in terms of data quality? Yes ☐ No ☐

Question 3. Is there any added value to the capacity building?

a. Improve the knowledge regarding the data quality and accuracy☐

b. Improve the competence in terms of data reporting to minimize errors ☐

c. Develop competences in data triangulation ☐

d. All above ☐

Question 4: To improve the data quality, in which extent/context does the coaching and supportive supervision visits of health district officials have an added value on the quality of data?

a. It allows to build the capacity of health providers on data quality ☐

b. It allows to know much about indicators' definition ☐

c. All above ☐

Question 5: Do you often receive supervision visits on data quality improvement of:

a. Health district province officials in charge of data ☐

b. Others stakeholder or partners implementing HIV program ☐

c. DSNIS staff ☐

d. Joint visits of health province and health district officials and partners implementing HIV program ☐

e. All above ☐

Question 6: Those supervision visits are of paramount importance in terms of data quality in general? Yes ☐ No ☐

2. **Influence of organizational structure on health data quality**

Question 1: How many staff oversee data recording into DHIS2?

a. 1 ☐

b. 2 ☐

c. 3 and more ☐

Question 2: Is the number of staff within the health information system sufficient for the workload of the data recording into DHIS2? Yes ☐ No ☐

Question 3: According to you, the number of staff in the facility health information service has an impact on the quality of data recorded into DHIS2? Yes ☐No ☐

Question 4: Are you accountable for reports recording into DHIS2? Yes ☐ No ☐,

Question 5: How do you collect reports from health facility services?

a. I collect reports from each service ☐

b. Each service submits a report to the data management service ☐

c. I collect final reports from the responsible of the health facility ☐

Question 6: Is there any collaboration between the health information staff and other staff who oversee data reporting with the health facility in terms of data correction? Yes ☐ No ☐?

Question 7: Is there any data analysis and review system within the health? Yes ☐ No

Question 8: Within the health facility, is there any system for monthly report data review before its submission to intended audience? Yes ☐ No ☐

Question 9: Do you think that the data verification system within the health facility may reduce data reporting errors? Yes ☐ No ☐

Question 10: To whom the monthly report is transmitted or submitted to?

1. Health District via DHIS2 ☐
2. Health province ☐
3. Partners implementing HIV program ☐
4. Health District via DHIS2 and Partners implementing HIV program ☐

Question 11: To improve the quality of data recorded into DHIS2, what are your suggestions regarding the organization structure of the health information system service work? One answer required.

a. Increase the number of staff ☐
b. Early avail the monthly and daily report ☐

Question 12: What is your suggestion to ensure that data recorded into DHIS2 are the same with data shared to all partners?

a. Use the same data reporting template ☐
b. Use DHIS2 as data source for all partners ☐
c. Initiate a close collaboration with health information system and health providers in charge of data reporting from different health services. ☐

Question 13: Data correction made with partners, are they communicated to the Health Information System staff for correction into DHIS2? Yes ☐ No ☐

Question 14: If the monthly report from different services within the health facility were recorded by the staff from the service, would this reduce data discordance and incoherence between those shared with partners to those recorded into DHIS2? Yes ☐ No ☐

Question 15: According to your understanding, what are the main reasons for the discrepancies between data recorded in DHIS2 to those shared with partners?

a. Recording or typing errors into DHIS2 ☐
b. Lack of data analysis after recording into DHIS2 ☐
c. Lack of direct communication between the HIV care service and the Health System Information staff regarding the monthly data correction ☐
d. Lack of capacity building of Health Information System staff on data analysis after recording into DHIS2 ☐

Question 16: Is there any importance to organize data analysis and validation meetings at health facility level? Yes ☐ or No ☐ If yes what I the added value?

a. Track data recording errors
b. Window for correction
c. Ownership of data
d. All above

3. Influence of incentives and rewards on health data quality

Question 1: At the workplace, do you often select the best employee each year? Yes ☐ No ☐

Question 2: Do you love to see that selection happen each year? Yes ☐ No ☐?

Question 3: Does the selection of the best employee have an impact on the performance of the employees? Yes ☐ No ☐ If yes, why?

1. Motivate employee ☐
2. Improve employee's performance ☐

Question 4: If no on question 3, do you prefer to initiate this kind of practice within the health facility?

Yes ☐ or No ☐

Question 5: How do you wish to be rewarded?

1. New position (Career development) ☐
2. Salary remuneration increase. ☐

Appendix 4: Data collection- Key Informant Guide

Fill in the following details

Sub section.....

Job title.....

1) When you think of data quality, what comes to mind?

……

……

……

2. Capacity Building

Is capacity building an important factor in determining quality of data in health facilities that provide HIV services?

Yes

No

Give explanation to your answer……

……

…….

2. Incentives and Rewards

Is Incentives and Rewards an important factor in determining quality of data in health facilities that provide HIV services?

Yes

No

Give explanation to your answer……

……

……

3. Organizational Structure

Is Organizational Structure an important factor in determining quality of data in health facilities that provide HIV services?

Yes

No

Give explanation to your answer……

……

……

Appendix 5: Work plan

Activity	2023										2024								
	Ma	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Ma	Apr	May	June	July	Aug	Sept
Concept note discussion	■																		
Concept note review and accepted		■																	
Gathering the documentation			■																
Proposal writing chapter 1-3				■	■														
Discuss with my supervisor on the 3 chapter						■													
Design the data collection tool				■	■														
Review and address comments from my supervisor						■	■	■	■	■	■	■							
Defense of the proposal													■						

Activity	2023										2024								
	Ma	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Jan	Feb	Ma	Apr	May	June	July	Aug	Sept
Field data collection																			
Data analysis and presentation																			
Final report writing																			
Final report review																			
Final report submission																			

Appendix 6: Budget

Item	Times	Number	Unit cost (BIF)	Total cost (BIF)
Transport fees for pre-testing	1	1	20,000	20,000
Transport fees for enumerators	3	9	3,000	81,000
Formatting and printing tools	1	4	1,000	4,000
Photocopy charges	4	66	100	26,400
Training for enumerators	1	9	20,000	180,000
Perdiem for enumerators	3	9	50,000	1,350,000
Internet charges	6	1	20,000	120,000
Proposal report binding charges	1	5	10,000	50,000
Contingencies (10%)	1	1		183,100
Total cost				**2,014,500**

Appendix 7: Map of Bujumbura-Mairie Province